UGI Utilities, Inc. - Electric Division for Approval of Phase IV of its Energy Efficiency and Conservation Plan	Docket No. M-2023-3043230
Initial Call-In Telephonic Hearing	

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Judge's Chambers

Commonwealth Keystone

Building – Plaza Level

400 North Street

Harrisburg, PA

Thursday, January 11, 2024

Commencing at 11:00 a.m.

INDEX TO EXHIBITS

Docket No. M-2023-3043230

Hearing Date: January 11, 2024

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BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

PETITION OF UGI UTILITIES, INC. – ELECTRIC DIVISION
FOR APPROVAL OF PHASE IV OF ITS
ENERGY EFFICIENCY AND CONSERVATION PLAN

DOCKET NO. M-2023-_____

TESTIMONY
OF
THEODORE M. LOVE

UGI ELECTRIC STATEMENT NO. 1

September 21, 2023

I. INTRODUCTION

Q. Please state your full name, occupation, and business address.

A. My name is Theodore M. Love, and I am a Partner at Green Energy Economics Group, Inc. ("GEEG"), an energy consulting firm founded in 2005. My business address is 2534 Downingsville Rd., Lincoln, VT 05443.

Q. On whose behalf are you testifying in this proceeding?

A. I am testifying on behalf of UGI Utilities, Inc. – Electric Division ("UGI Electric" or the "Company").

Q. Please briefly state your qualifications.

A. I have been involved in the review and preparation of electric and natural gas energy efficiency and conservation ("EE&C") plans, as well as potential studies and cost-effectiveness analyses, in nearly a dozen states, three Canadian Provinces, and China, since I began working with GEEG in 2007. Most relevant to this proceeding, I have been advising UGI Electric on the implementation, analysis, and reporting of the current phase ("Phase III") of its EE&C Plan. I have also been advising UGI Utilities, Inc. -Gas Division ("UGI Gas") on its natural gas EE&C Plan since 2015 and Philadelphia Gas Works ("PGW") on its natural gas energy efficiency activities since 2008. My full resume is attached as UGI Electric Exhibit TML-1.

Q. Have you previously provided expert testimony before the Pennsylvania Public Utility Commission ("Commission")?

A. Yes. In 2018, I presented testimony on behalf of UGI Electric for approval of its Phase II EE&C Plan (Docket No. M-2018-3004144). I also provided testimony supporting UGI Gas's EE&C Plans in three prior base rate cases at Docket Nos. R-2015-2518438, R-2016-2580030, and R-2018-3006814, respectively. I presented testimony on behalf of PGW in support of the continuation of its demand-side management ("DSM") gas programs at Docket Nos. P-2014-2459362 and P-2014-2459362. I also provided testimony for Peoples Natural Gas in support of the approval of its EE&C Plan at Docket No. M-2017-2640306 in 2018.

Q. What is the purpose of your direct testimony in this proceeding?

A. I will provide support for and information about Phase IV of UGI Electric's EE&C Plan ("Phase IV EE&C Plan" or the "Plan"). I will explain the goals, approach, and process that UGI Electric applied to the preparation of its Phase IV EE&C Plan. I will provide details on the Plan's benefits and costs and will explain UGI Electric's proposal for Plan implementation, program verification, and reporting and administrative requirements.

Q. Are you sponsoring any exhibits in the filing?

A. Yes. I am sponsoring the following exhibits:

- UGI Electric Exhibit 1 – UGI Electric's Phase IV EE&C Plan, which is attached to the Petition for Approval of the Phase IV EE&C Plan; and

- UGI Electric Exhibit TML-1 – Resume of Theodore M. Love, which is attached to this testimony.

Q. Please summarize your testimony.

A. I begin by describing the background for the Phase IV EE&C Plan and providing an overview of the Plan. I then describe how UGI Electric's proposed Phase IV EE&C Plan was developed and discuss what changes are proposed for the Phase IV EE&C Plan. Next, I will provide additional details on the Plan's benefits and costs. Finally, I describe how the Plan will be administered as well as the proposed evaluation, measurement, and verification ("EM&V") activities for the Plan.

II. BACKGROUND AND PLAN OVERVIEW

Q. Does the Company currently operate an EE&C Plan?

A. Yes. UGI Electric currently operates its voluntary Phase III EE&C Plan, which is approved through May 31, 2024. Phase I of UGI Electric's voluntary EE&C Plan operated from June 1, 2012, to May 31, 2015. Phase II of UGI Electric's voluntary EE&C Plan was initially approved for operation from June 1, 2016, through May 31, 2018, and was extended for an additional year by a Commission Order entered on May 4, 2017. The Phase III voluntary EE&C Plan was approved from June 1, 2019, to May 31, 2024.

Q. Is UGI Electric required to comply with Act 129 of 2008 ("Act 129")?

A. No. I have been advised by counsel that because UGI Electric serves fewer than 100,000 customers (approximately 62,000 customers), the Company is not subject to the requirements of Act 129.

Q. Why did the Company choose to operate a voluntary EE&C Plan and to offer energy efficiency and conservation programs to its customers?

A. The primary reasons for offering these programs are to address customer demands for these types of EE&C programs and to continue improving customer satisfaction levels. Since UGI Electric's service territory is surrounded by larger electric distribution companies ("EDCs") that offer energy efficiency programs and rebates through Act 129, the Company continues to believe its customers should have access to the same types of energy savings opportunities. Additionally, UGI Electric sought to institute an EE&C Plan for its customers based on the guidance contained in the Commission's December 23, 2009 Secretarial Letter issued at Docket No. M-2009-2142851 ("December 23, 2009 Secretarial Letter"), which asked the smaller EDCs in Pennsylvania to consider voluntarily filing EE&C Plans.

Moreover, UGI Electric has seen significant benefits from its existing EE&C programs and believes that there are additional incremental opportunities for customers to take advantage of, such as revised or new incentives to assist with their implementation of energy efficiency strategies and high efficiency equipment purchases. The Company believes that the proposed Phase IV EE&C Plan will provide meaningful benefits to customers, assist in overall load reduction goals,

and be implemented in a manner that does not disadvantage the Company or its customers.

Q. Why is UGI Electric filing a Petition for Approval of its Phase IV EE&C Plan now?

A. UGI Electric's current Phase III EE&C Plan is set to end on May 31, 2024. In this proceeding, UGI Electric is seeking approval of a new five-year Phase IV EE&C Plan that, to the extent possible, would commence June 1, 2024, and end May 31, 2029. This would allow customers to continue taking advantage of energy savings initiatives on an uninterrupted basis and would allow UGI Electric's customers to stay competitive with other customers in Pennsylvania that have access to electric efficiency programs offered under Act 129.

Q. Please provide a summary of UGI Electric's Phase IV EE&C Plan.

A. The Phase IV EE&C Plan provides a portfolio of EE&C programs that is targeted at all of UGI Electric's various customer segments and is designed to reduce overall electricity consumption by approximately 3.04% by 2029 compared to the Company's annual historic load for June 1, 2007, to May 31, 2008. These programs have been designed as a portfolio to offer UGI Electric's customers a variety of cost-effective options to reduce electricity consumption, which ultimately will help all customers reduce their energy costs. These programs were developed in the context of providing a workable plan for UGI Electric's service territory while continuing successful programs from UGI Electric's Phase III EE&C Plan. The

Plan is expected to save 32,723 MWh over five years and cost approximately $10.5 million (approximately $2.1 million per year). The Plan is expected to provide present value net Total Resource Cost ("TRC") benefits of $17.5 million with an overall TRC benefit-cost ratio ("BCR") of 2.24.

UGI Electric's Phase IV EE&C Plan includes some updates to its Phase III EE&C Plan, which are summarized below and addressed in more detail in the following section of my direct testimony. In particular, changes from the Phase III EE&C Plan to the Phase IV EE&C Plan include:

1. Incorporating a proposed savings target of 3.0% of 2008 sales, or 32,250 MWh, by 2029;
2. Adding an Energy Kits Program to provide energy saving guidance and energy saving kits to qualifying residential customers;
3. Expanding the measures offered through the Appliance Rebate Program, and a projected increase in participation;
4. Allowing stand-alone pickup for dehumidifiers and room air-conditioners in the Appliance Recycling Program;
5. Expanding the School Energy Education Program to an additional high school; and
6. Reworking the existing Commercial and Industrial ("C&I") Custom Incentive Program into three pathways: (1) a prescriptive pathway; (2) custom pathway; and (3) direct install pathway for small business.

Q. Are there any significant uncertainties that may affect UGI Electric's Phase IV EE&C Plan?

A. Yes. The Company anticipates two major sources of uncertainty that may have an outsized effect on the Plan over its lifetime. First, there are several new federal programs and initiatives that may affect the outcome of the Plan. Specifically, the Company will closely monitor the Inflation Reduction Act of 2022 ("IRA") and the effects it may have on program activity and cost-effectiveness reporting. Currently, the IRA provides significant tax credits that overlap with offerings in the Plan, such as heat pump water heaters. It remains to be seen how many of UGI Electric's customers will take advantage of these tax credits and how those tax credits may affect the supply, distribution, and installation of efficient equipment in UGI Electric's service territory. The Company will also be monitoring the Home Energy Performance-Based Whole-House Rebates ("HOMES") and High-Efficiency Electric Home Rebate Act ("HEEHRA"). In particular, UGI Electric will closely watch the potential implementation of HOMES and HEEHRA in Pennsylvania for how they may interact and/or overlap with the Plan's offerings.

More generally, during Phase IV of UGI Electric's EE&C Plan, there will be new potential studies, new policy goals, an updated Technical Reference Manual ("TRM"), a new TRC Test order, and EE&C Plan filings for Phase V of Act 129. Due to UGI Electric's size, it is not subject to Act 129; however, the Company's EE&C Plan is designed along similar lines to Act 129, and measure savings are calculated using the Act 129 TRM, where possible. UGI Electric will keep a close

eye on Phase V of Act 129 planning activities and will consider updating its Phase IV EE&C Plan to keep the Plan aligned with Act 129 electric efficiency initiatives.

In addition, the effectiveness of the Company's communication efforts and associated customer willingness to implement EE&C measures will impact program participation. Also, the general state of the economy may adversely affect the ability of customers, particularly C&I customers, to make investments in energy efficiency projects. The current interest rate environment, with rates at multi-decade highs, makes financing options limited for many customers, while the lingering effects of COVID-19 on supply chains have created additional complexities in stocking efficient equipment. Despite these headwinds, the proposed Plan will provide needed financial and technical assistance to UGI Electric's customers to help them use energy as efficiently as possible and deliver significant economic benefits to Pennsylvania as a whole.

III. PLAN DEVELOPMENT AND UPDATES

Q. What are UGI Electric's annual performance goals for energy savings and allowed expenses over the course of the Plan, as suggested in the Commission's December 23, 2009 Secretarial Letter?

A. UGI Electric is voluntarily attempting to reduce electric consumption by 3.00% by 2029 (as measured against the Company's annual historical load for June 1, 2007, to May 31, 2008). This represents a savings target of approximately 32,250 MWh, and UGI Electric's Phase IV EE&C Plan is projected to achieve savings of approximately 32,723 MWh, or approximately 101% of that savings target. As

noted in the Commission's December 23, 2009 Secretarial Letter, UGI Electric is attempting to reach this target while spending less than 2% of its annual jurisdictional revenues for the 12-month period ended May 31, 2008, or $2.5 million, for each program year. The Company projects that it will cost approximately $10.5 million over five years, or approximately $2.1 million per year, for UGI Electric to achieve its savings target.

Q. What process did UGI Electric undertake to develop its Phase IV EE&C Plan?

A. UGI Electric's EE&C team worked closely with myself and other expert consultants under my direction to carefully develop the Plan, while using the Commission's orders in the Act 129 proceedings as a basic framework upon which to build its Phase IV EE&C Plan. The savings target for the Phase IV EE&C Plan was based on the statewide consumption reduction targets from the Final Implementation Order for Act 129 Phase IV dated June 18, 2020. That order established savings targets ranging from 2.4% of reference load for West Penn Power Company ("West Penn") to 3.5% of reference load for PECO Energy Company ("PECO"). Here, UGI Electric is proposing a target of 3.0%, which is in the middle of that range.

The UGI Electric EE&C team conducted an extensive review of the performance of the Company's EE&C programs to date as well as a comprehensive list of EE&C measures and practices from several other sources, primarily the Commission-approved EE&C programs currently utilized by the Act 129 EDCs, and other available cost-effective EE&C measures. This research also included a

review of future federal and state regulations that could affect EE&C programs and measures.

Data on technical specifications, energy use impacts, and measure costs were compiled from various trusted sources. The Pennsylvania Act 129 TRM from 2019, with errata update in February 2021, served as a default source for most measures. Avoided costs for electricity came from PPL Electric Utilities Corporation's ("PPL Electric") approved Phase IV EE&C Plan, consistent with the approach used for UGI Electric's current Phase III EE&C Plan. Together these assumptions were used to compute cost-effectiveness from a TRC Test perspective.

The next step was to determine the potential for the existing programs in the future and assess alternative programs and measures that were not yet part of the Company's portfolio. The UGI Electric EE&C team began with the programs offered by the Company in its Phase III EE&C Plan and then layered in successful program design from other EDCs in Pennsylvania and best practices from other jurisdictions to put together an updated portfolio of programs and measures with a high likelihood of meeting savings targets. Working with the UGI Electric EE&C team and conservation service providers ("CSPs"), my team developed participation rates and program spending assumptions and determined potential program, sector, and portfolio savings costs, and cost-effectiveness from the TRC perspective.

UGI Electric balanced the portfolio by adjusting the number of participants to develop a reasonable mix of programs likely to reach the Plan's savings and

spending objectives, while maintaining cost-effectiveness under the TRC Test at a sector and plan level.

Although UGI Electric is not subject to the requirements of Act 129, the energy-saving targets, expenditure guidelines, cost-effectiveness, and the customer equity guidelines outlined by Act 129 and the Commission's related December 23, 2009 Secretarial Letter defined the major parameters and constraints for developing the portfolio. Specifically, the Company established a savings target and used actual revenues for the 12-month period June 2007 through May 2008 to determine its approximate 2% of annual revenue expenditure level, which served as an upper boundary for Plan development.

Q. Does the proposed Phase IV EE&C Plan provide EE&C measures to low-income customers on UGI Electric's system?

A. Yes. UGI Electric was mindful in developing its Phase IV EE&C Plan to include programs and measures that will aid its low-income customers in reducing their energy consumption, even though the Company is not subject to the requirements of Act 129. The Company will continue to offer the Low-Income Program that provides free installation of heat pump water heaters and smart thermostats at no cost to qualifying low-income customers. In addition, many of the residential program offerings are available at no cost to the customer, including the new Energy Kits Program, as well as the existing Appliance Recycling and School Energy Education Programs.

Q. What are the estimated costs and savings for the Phase IV Low-Income Program?

A. The Low-Income Program is projected to save 159 MWh of energy at a cost of $245,000 over the five years of Phase IV. The program is projected to provide net benefits of $20,000 with a TRC BCR of 1.11.

Q. Are there any new residential programs in Phase IV?

A. Yes. UGI Electric is proposing the Energy Kits Program. This program will provide a key pathway for customers to learn about saving energy and the opportunities available through UGI Electric's EE&C programs. Specifically, it will provide a website for customers to complete an online questionnaire that will result in a customized list of recommendations for saving energy, including referrals to other relevant programs. Customers who indicate that they use electricity for water heating through the self-assessment can then choose to receive a water saving kit shipped to their home at no cost. This kit will include low-flow bath and kitchen faucet aerators and a low-flow showerhead. Kits will be limited to one per account every five years.

The Energy Kits Program is projected to cost $381,250 over five years and will serve as a gateway for customers to learn about UGI Electric's programs and the many opportunities they have for saving energy. The water heating kits provide customers with an easy way to save approximately 4.0 GWh of electricity and 43.4 million gallons of water over the lifetime of the measures, without customers spending any money up front. The program is also projected to provide $329,361

in present value of net benefits with a 2.00 BCR under the TRC Test. The Energy Kit Program will round out the residential program offering for the portfolio, provide a no-cost entryway for customers, drive engagement to other programs, and boost portfolio savings and cost-effectiveness.

Q. Are there any updates to existing residential program in Phase IV?

A. Yes, there are few updates to existing programs for Phase IV, including the Appliance Rebate Program, Appliance Recycling Program, and School Energy Education Program. Most of these updates were made in order to help UGI Electric achieve the higher Phase IV savings target.

Q. What changes are proposed for the Appliance Rebate Program?

A. First, UGI Electric is adding incentives for air source heat pumps and heat pump water heaters to the Appliance Rebate Program. Higher Phase IV avoided costs make it possible for these measures to be added without jeopardizing the cost-effectiveness of the program or overall Plan. In addition, UGI Electric wants to meet anticipated customer interest given new tax incentives and the availability of rebates from other Act 129 programs for these measures. These new measures, along with increasing customer demand for ductless mini-split heat pumps, lead to a projected increase in spending and savings for the program. The program's budget in Phase IV of $1.74 million over five years is 40% higher than the program's budget in Phase III of $1.24 million over five years. However, Phase IV savings are projected to be 7,416 annual MWh, *i.e.*, 128% higher than the last phase

projection of 3,258 annual MWh. Therefore, the updated Appliance Rebate Program is projected to be much more cost-effective in Phase IV (with a TRC BCR of 3.13) when compared to its Phase III version (with a TRC BCR of 1.11) and will be essential for reaching UGI Electric's Phase IV savings goals.

Q. Will UGI Electric offer a custom measure incentive under the Appliance Rebate Program?

A. Not initially. The Plan does provide criteria for custom measures under the Appliance Rebate Program, including a requirement to have a TRC BCR of at least 1.0 and an incentive maximum of the lesser of $0.14 per kWh saved or 50% of the measure cost. The Company will use these criteria for offering prescriptive rebates in the future for new measures that may make sense as a prescriptive offering under the Appliance Rebate Program. Given the five-year term for Phase IV and the administrative burden for a small EDC to file EE&C Plan changes to add new measures, this approach provides crucial flexibility for UGI Electric to address any future changes to the residential equipment market.

Q. What changes are proposed for the Appliance Recycling Program?

A. One way that UGI Electric is proposing to meet the higher savings goals for Phase IV is to expand the Appliance Recycling Program to allow pick-ups of qualifying dehumidifiers and room air-conditioning units on their own. Currently, these units are only eligible for a rebate through the Appliance Recycling Program when the customers are also recycling a refrigerator or freezer. The current offer has been

successful and expanding the criteria for retrieval will help reach additional residential customers.

Q. With those changes, what are the estimated costs and savings for the Appliance Recycling Program?

A. The Appliance Recycling Program is projected to save 2,565 MWh of energy at a cost of $1.1 million over the five years of Phase IV. The program is projected to provide net benefits of $7,000 with a TRC BCR of 1.01.

Q. What changes are proposed for the School Energy Education Program?

A. The School Energy Education Program has been one of the Company's most successful residential programs, and as such, UGI Electric plans to expand the program to one additional high school that has yet to receive services from the program.

Q. With that change, what are the estimated costs and savings for the School Energy Education Program?

A. The School Energy Education Program is projected to save 2,352 MWh of energy at a cost of $1.3 million over the five years of Phase IV. The program is projected to provide net benefits of $4.0 million with a TRC BCR of 4.72.

Q. Are there any changes to C&I programs in Phase IV?

A. Yes. For Phase IV, there will be three different pathways for measures in the C&I Incentive Program that C&I customers can pursue. The three pathways are prescriptive, custom, and direct install for small businesses. The "Prescriptive Pathway" will be the simplest path for customer participation but will also offer the lowest incentive of the three pathways. The Company anticipates offering prescriptive incentives for lighting at the start of Phase IV; however, UGI Electric may expand to include other measures, such as refrigeration or heating, ventilation, and air conditioning ("HVAC"). Customers must fill out a rebate application, which will require a valid UGI Electric account number and a proof of purchase dated within 180 days of application. The rebate application will be submitted to a program administrator who will then validate the application and provide a rebate.

The current Phase III C&I Custom Incentive Program has been maintained as the "Custom Pathway." This will be available for any efficiency measures not covered under the Prescriptive Pathway. A custom project will be analyzed for savings and cost-effectiveness, and a custom rebate offer will be provided based on the saving of project and dollar per kWh incentive amount, currently projected at $0.10 per kWh. After the project's installation, the program administrator will verify that the correct equipment was installed and pay the rebate.

A third pathway, the "Direct Install for Small Business" pathway, is available for customers who are in the Small Commercial and Industrial ("SCI") customer class. Customers who choose this pathway will receive a free energy assessment that will result in a report outlining recommended measures and the incentive that will be available for completing the work. The SCI customer will

then be referred to a network of trade allies who can perform the work. After the work is performed and verified, the rebate will be paid. This pathway has the highest incentive levels in the program and covers any measures that save electricity.

Q. Why is the Company proposing a "Direct Install for Small Business" pathway for the C&I Incentive Program?

A. Small business customers are a traditionally underserved market for energy efficiency programs. Historically, the Company has seen most of the energy savings in its C&I Custom Incentive Program come from the Large Commercial and Industrial ("LCI") customer class. The Direct Install for Small Business pathway will only be open to SCI customers, and it will allow UGI Electric to provide the higher incentives and additional technical assistance that will make sure that these customers can achieve savings that will have a real impact on their operating costs. By leveraging the design of the direct install pathway, the Company anticipates it will be able to reach this underserved community and ensure that all customer classes are served appropriately by the proposed Phase IV Plan.

Q. With these changes, what are the estimated costs and savings for the C&I Incentive Program?

A. The proposed C&I Incentive Program is projected to cost $3.9 million over five years, which is a 12% increase over the Phase III budget of $3.5 million over five

years. The program is projected to achieve 19,804 annual MWh in savings and deliver $8.3 million in present value TRC net benefits with a TRC BCR of 2.18.

IV. PLAN BENEFITS AND COSTS

Q. What savings are projected for UGI Electric's Phase IV EE&C Plan?

A. UGI Electric projects annual savings to total 32,723 MWh by the fifth year of the Plan, which is approximately 101% of its target of 32,250 MWh. Of these savings, 12,919 MWh, or 40%, come from the residential sector, and 19,804 MWh, or 60%, come from the C&I sector. Table 2 of the Plan provides a breakout of savings by program, and the individual program sections in the Plan breakout projected savings by year.

Q. What are the projected costs to achieve these savings?

A. UGI Electric anticipates costs of approximately $10.5 million over five years to achieve the projected savings. Costs for the residential sector programs are projected to be $4.8 million over five years, and costs for the C&I sector programs are expected to be $3.9 million over five years. UGI Electric also projects portfolio-wide administrative costs of $1.7 million over five years. The individual program sections in the Plan provide a breakout of costs by year and category.

Q. Does UGI Electric's Phase IV EE&C Plan meet the criteria for spending caps outlined in the Commission's December 23, 2009 Secretarial Letter?

A. Yes. UGI Electric is projecting annual spending of approximately $2.1 million per year, with the largest single year's cost projected to be $2.3 million. Therefore, the Company's projected annual spending is below the $2.5 million per year cap derived from 2% of 2008 revenue.

Q. Does UGI Electric's proposed Phase IV EE&C Plan provide a detailed description of each program in the Plan and a calculation of benefits and costs?

A. Yes, it does. The Plan clearly delineates each program and all of its features as well as the calculation of benefits and costs for each program and measure.

Q. Does the proposed Plan meet the Commission's TRC Test?

A. Yes. As a smaller EDC, UGI Electric is not subject to the requirements of Act 129. However, the Commission's December 23, 2009 Secretarial Letter indicated that the voluntary programs offered by a smaller EDC should meet the TRC Test. The Phase IV EE&C Plan is cost-effective according to the TRC Test established by the Commission. UGI Electric's analysis indicates an overall TRC BCR of 2.24 for the proposed portfolio, with a TRC BCR of 2.92 for the residential sector and a TRC BCR of 2.18 for the C&I sector.

Q. Do all measures and programs provide positive net benefits from a TRC Test perspective?

A. No. The Community-Based Organization ("CBO") Marketing Program provides no claimed savings and has no TRC benefits under the Commission's TRC Test. Some measures within the Residential Appliance Rebate Program are not cost-effective from a TRC Test perspective; however, the overall Program is cost effective with a TRC BCR of 3.13. Moreover, consistent with prior Commission orders on this issue, the portfolio overall is projected to be cost-effective on a TRC Test basis, as discussed above.

V. IMPLEMENTATION, ADMINISTRATION, AND EM&V

Q. Please summarize UGI Electric's strategy to implement the Phase IV EE&C Plan after Commission review and approval.

A. Implementation of UGI Electric's Phase IV EE&C Plan will rely on the performance of the Company's internal staff in collaboration with CSPs, trade allies, community agencies, and other entities engaged in energy efficiency activities to promote, administer, and support the effective deployment of programs. Various forms of communication, including the Company website, bill inserts, direct mailings, print and radio advertisements, and social media, will be utilized as needed to reach customers with Plan details. UGI Electric's internal EE&C Staff will oversee planning, marketing, and implementation for the Phase IV EE&C Plan and will continue utilizing program CSPs to deliver services in support of the Phase IV EE&C Plan programs.

Q. How is the Company proposing to track, evaluate, and report on the Phase IV EE&C Plan?

A. CSPs will conduct verifications of applications and participants and collect all the required data needed to calculate savings and cost-effectiveness. This information will then be transmitted to the UGI Electric reporting database, which stores participation, costs, savings, and cost-effectiveness information on all the programs in the Plan. UGI Electric's EE&C team and consultants will continue to verify the data entered in the reporting system and evaluate progress against stated Plan goals. No later than three months after each Program Year ("PY") concludes, the Company will compile and provide an annual report, which will include program highlights and updates, as well as progress towards Plan goals, such as savings and costs.

UGI Electric will also contract with a third-party evaluator to perform a process and impact evaluation on its programs during the Plan. The Company plans to evaluate its residential programs in PY14 and then evaluate its nonresidential program in PY15, once the program has had some time to ramp up and achieve meaningful participation.

Q. Does this conclude your direct testimony?

A. Yes, it does. I reserve the right to submit supplemental testimony during the course of the proceeding. Thank you.

Theodore Love

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Professional Experience

Green Energy Economics Group, Inc. – Cuttingsville, VT

Partner	2017 to Present
Senior Associate and Data Scientist	2013 to 2017
Associate	2010 to 2013
Analyst	2007 to 2010

For over 15 years, Theodore "Theo" Love has been providing insights into the design, analysis, and implementation of energy efficiency and distributed energy resource programs and portfolios in twelve states, three Canadian provinces, and China. He has a particular focus on EE/DER policy analysis, program design and implementation, cost-effectiveness testing, financing, and building scalable tools to analyze everything from individual projects to programs to portfolios. Some recent project experience includes:

- Providing regulatory and policy analysis assistance to the Small business Utility Advocate in California and Ontario on various energy efficiency dockets.
- Ongoing review and analysis of EfficiencyOne's energy efficiency portfolio in Nova Scotia on behalf of the Consumer Advocate of Nova Scotia.
- Design, regulatory, and implementation support for voluntary electric and gas energy efficiency programs in Pennsylvania for UGI, PGW, and Columbia Gas.
- Working with PSE&G in New Jersey on forecasting and scaling their internally managed commercial and industrial programs.

2007 – 2010
Consultant, **Alter & Rosen, LLP**, New York, NY

2006 – 2007
Client Reporting Analyst, **AllianceBernstein LP**, White Plains, NY

Affiliations

Association of Energy Service Professionals (AESP) - Business Issues and Regulatory Models Topic Committee Co-Chair 2023 - present
AESP Gas Topic Committee Co-Chair 2019-2023
AESP National Conference Planning Committee 2021, 2022, 2023
Energy Efficiency Alliance (EEA) of Pennsylvania / New Jersey - Policy Conference Planning Committee 2022, 2023

Recent Project Experience

Green Energy Economics Group, Inc.

Economic and Policy Analysis
Small Business Utility Advocate - California *(June 2020 – Present)*

- Performing data analysis of underserved small and medium business customers as part of the California Energy Efficiency Coordinating Committee (CAEECC) Underserved Working Group for Small and Medium Business (SMB).
- Prepared report and analysis of arrearages for small businesses due to COVID-19 and assisted with policy recommendations and comments on strategies to address COVID-19 related debt (Do. No. 21-01-014)
- Assisted with analysis and comments for ongoing docket on clean energy financing (Do. No. 20-08-022)
- Provided comments on program design of CleanPowerSF's Food Service Program (Do. No R13-11-05)
- Provided comments on program design for PG&E, SCE, and SoCalGas's business plans and gas incentive retirement (Do. No. R22-02-005)

Economic and Policy Analysis
Small Business Utility Alliance – Ontario, CA *(June 2021 – Present)*

- Provided analysis and evidence on Enbridge Gas of Ontario's 2023 through 2027 DSM Plan (Matter No. EB-2021-0002)

Economic and Policy Analysis
Consumer Advocate – Nova Scotia *(March 2019 – Present)*

- Member of DSM Advisory Group (DSMAG) on behalf of the Consumer Advocate of Nova Scotia to provide ongoing support for design and implementation of programs.
- Provided analysis and written testimony on Efficiency One's (E1) 2023 – 2025 DSM Plan (Matter No. M10473) as it relates to historical spending, affordability, underserved communities, and avoided costs.
- Provided analysis and written testimony on Efficiency One's (E1) 2020 – 2022 DSM Plan (Matter No. M09096) as it relates to spending and savings levels, affordability, and allocation of funds.
- Provided comments on the 2019 DSM Potential Study's economic analysis and projection assumptions and approach

Program Management and Benefit Cost Analysis Expert
Public Service Enterprise Group (PSE&G) – New Jersey *(October 2021 – April 2023)*

- Consulted on forecasting and management of PSE&G's internally run commercial Engineered Solutions and Direct Install programs.
- Assisted with rollout of tracking system for PSE&G DSM portfolio.

- Provided assistance with calculation of six economic tests for PSE&G's energy efficiency and conservation portfolio, including development of calculation engine and launch as a subcontractor to ANB Enterprises.

Development and Regulatory Support for DSM Portfolio
Columbia Gas of Pennsylvania - Pittsburgh, Pennsylvania (February 2022 – Present)

- Successfully developed, provided regulatory support for, and got approval of a three-year voluntary gas energy efficiency plan and provided supporting testimony under Docket No. P-2014-2459362.
- Ongoing assistance with the launch and implementation of the first three-year voluntary gas energy efficiency plan.

Development and Implementation of Energy Efficiency and Conservation Plans
UGI Utilities, Inc. – Pennsylvania (June 2015 – Present)
Assist UGI Utilities, Inc. and PNG with the development and approval of Energy Efficiency and Conservation (EE&C) Plans for their UGI Gas PNG Gas, and UGI Electric divisions, including:

- Ongoing evaluation and portfolio planning activities for both UGI Gas and UGI Electric energy efficiency portfolios.
- Developing an achievable efficiency scenarios for UGI Gas and PNG Gas.
- Designing a five-year, $27 million energy efficiency and conservation plan for UGI Gas. Submitting direct testimony on behalf of UGI Gas, Inc. on the design and implementation of the proposed plan (Docket No. R-2015-2518438)
- Designing a five-year $15 million energy efficiency and conservation plan for PNG Gas. Submitting direct testimony on behalf of PNG Gas, Inc. on the design and implementation of the proposed plan (Docket No. R-2016-2580030)
- Assisting with the design and implementation and reporting of the UGI Electric's voluntary EE programs. Designing and assisting with approval for a five-year $7.2 million electric energy efficiency and conservation plan (Docket No. M-2018-3004144)

Strategic Planning and Implementation of DSM Portfolio
Philadelphia Gas Work's (PGW) - Philadelphia, Pennsylvania (August 2008 – Present)

- Assisting with ongoing program planning and implementation of both the Low-Income Usage Reduction Plan (LIURP) and the market-rate DSM portfolio.
- Provided supporting testimony and analysis for the Phase III market-rate DSM plan under Docket No. P-2014-2459362.
- Designed Phase II plan with PGW and submitted direct testimony supporting the plan on behalf of PGW (Docket No. P-2014-2459362)
- Member of lead consulting team that aided in the design and approval of PGW's five-year, $54 million portfolio of DSM programs;
- Providing ongoing technical assistance in the development of PGW's $35 million Phase II five year plan.
- Providing ongoing technical support in program design and implementation, including the roll-out of six programs that, combined since inception, have saved 120,000 MMBtus at a cost of approximately $17 million;

- Developed specifications for and currently collaborating with internal PGW staff on database system to track weatherization projects, rebate applications, and other information pertaining to PGW's DSM portfolio;
- Developed multiple Excel-based tools used by contractors to perform field audits, provide QA/QC, and track ongoing progress for contractors, programs, and the portfolio as a whole;
- Provided research and analysis support for multiple rounds of expert testimony before the Pennsylvania Public Utility Commission (Docket R-2009—2149884);
- Aided in the issuance of RFPs and selection of candidates for over $40 million in contracts;
- Major contributor to PGW's ongoing formal reporting and evaluation process, including the issuance of five implementation plans, three annual reports, and two impact evaluations.

DSM Potential Studies in New York, New Jersey, and Pennsylvania
Optimal Energy, Inc. - Vermont (December 2018 – December 2019)

- Assisted Optimal Energy, Inc. with the development of measure assumptions and characterizations for statewide, electric and gas DSM potential studies.

Natural Gas Efficiency Options and EE&C Plan for Peoples Natural Gas
Peoples Natural Gas, Inc. – Pennsylvania (September 2017 – February 2019)

- Prepared report on program, sector, and portfolio-level cost and savings for 29 natural gas administrators in 11 States, and provided recommendations for potential natural gas DSM opportunities for Peoples Natural Gas
- Assist with stakeholder review process
- Developed five year $42 million Energy Efficiency and Conservation (EE&C) Plan, and provided testimony to support the adoption of the Plan (ongoing).

Research on Leading Energy Efficiency Portfolios
Green Energy Economics Group - Vermont (November 2007 – Present)

- Maintain research and proprietary analysis on actual and projected results from over a dozen electric and natural gas demand side management (DSM) portfolios throughout North America;

Analytic and Technical Support for DSM Tracking Systems
PECO Energy Company – Pennsylvania (September 2016 – December 2017)
Commonwealth Edison Company – Illinois (August 2017 – August 2018)
Companywide (September 2020 – present)

- Subcontractor to ANB Systems Inc. to provide domain expertise and analytic support to rollout of enhanced tracking system.
- Developed dashboards and internal reports used by PECO's EM&V team, business planning, and various program and portfolio managers.
- Guided automation of PECO's six-month and annual reporting process.
- Provided expert guidance on the development of cost effectiveness calculation modules for clients in Pennsylvania and New Jersey

- Oversaw project development of audit tool for ComEd's Carbon Free School Assessment Program.

Technical Assistance for Energy Efficiency Program Planning
Green Mountain Power - *Vermont* *(August 2012 – July 2017)*
- Developed multivariable regression model and framework to estimate the cost per kW to address a reliability gap in the St. Albans region with targeted energy efficiency.
- Reviewed and analyzed program proposals for the $20 million Community Energy & Efficiency Development Fund (CEED Fund), including the development of scoring and rebalancing mechanisms;
- Analyzed dataset of 5,000 custom business projects to establish models used for future planning exercises.
- Prepared report on uncounted benefits of renewable generation sources for Vermont.

Analysis of Energy Efficiency in British Columbia
BC Sustainable Energy Association & Sierra Club BC, *British Columbia (May 2011 – June 2014)*
- Provided comments and energy efficiency opportunities report for proceedings on FortisBC Gas and Electric's long-term DSM plans in December of 2013.
- Assisted on research for direct testimony on reasonableness of gas DSM Plan by Fortis Energy Utilities before the British Columbia Utilities Commission, BCUC Project No. 3698627;
- Technical support on assessment of FortisBC Electric's long-term DSM plan and corresponding expert testimony;
- Assistance with direct testimony and technical support on assessment of BC Hydro's long-term DSM plan, before the BCUC.

Energy Efficiency Potential in Oklahoma
Sierra Club, *Oklahoma* *(April 2011 – November 2011, December 2013 – January 2014)*
- Provided updated report for energy efficiency in Oklahoma and additional comments on PUC rulemaking for electric and gas utility programs.
- Preparation of report on energy efficiency potential for Oklahoma;
- Assistance with research and drafting comments on the US regional haze Federal Implementation Plan for the State of Oklahoma;
- Research and formulation of energy efficiency potential projections provided as part of expert testimony for Oklahoma Gas & Electric's rate case before the Corporation Commission of Oklahoma, Cause No. PUD 201100087.

Technical Assistance for Energy Efficiency Programs
Focus on Energy - *Wisconsin* *(June 2011 – August 2013)*
- Developed and customized cost-effectiveness calculators for Wisconsin's Focus on Energy portfolio of energy efficiency programs;
- Trained staff and other consultants on usage of tools and general economic analysis of energy efficiency programs;

- Provided QA/QC on cost-effectiveness analysis of 14 programs spending over $160 million in two years.

Chicagoland Energy Efficiency Portfolio
People's Gas - *Chicago, Illinois* *(September 2008 – January 2013)*

- Providing ongoing regulatory support;
- Provided cost-benefit analysis of various program scenarios and aided in the analysis of contractor bids;
- Customized excel-based portfolio and project cost-effectiveness tools to client's specifications.

Testimony Support for Expanding Gas Energy Efficiency in Pennsylvania
Citizens for Pennsylvania's Future, *Pennsylvania* *(July 2013 – September 2013)*

- Provided support on preparation of testimony regarding Peoples Gas of Pennsylvania's DSM plans, including preparation of benchmarking report and alternative scenario projections.

Energy Efficiency Potential in Texas
Sierra Club, *Texas* *(May 2012 – August 2012)*

- Research and development of alternative energy efficiency potential scenarios for the ten investor owned utilities (IOUs) in Texas;
- Development of comments for the Public Utility Commission of Texas;
- Development of presentation before the Energy Efficiency Incentive Program Committee.

Austin Energy's Energy Efficiency Potential
Austin City Council Consumer Advocate, *Austin, Texas* *(April 2012)*

- Research and development of alternative energy efficiency potential scenarios for Austin Energy.

Nevada Power's Energy Efficiency Potential
Sierra Club, *Nevada* *(November 2011 – June 2012)*

- Research on Nevada Power's Integrated Resource Plan (IRP) and development of alternative energy efficiency potential projections.

Comments on EmPower Maryland Programs
Sierra Club, *Maryland* *(September 2011 – October 2011)*

- Research for and development of comments on EmPower Maryland's energy efficiency programs, including the development of alternative energy efficiency potential projections.

Ontario Power Authority Field Audit Support Tool
Green Communities Canada - *Ontario, Canada* *(January 2011 – May 2011)*

- Collected and implemented specifications for updating the tool used by Ontario Power Authority's low-income program field agents to collect data and determine project net present values;
- Added custom features including customer input forms, saving and closing routines, and database file importing.

Energy Efficiency Potential in Arkansas
Sierra Club/Audubon Society, *Arkansas* *(September 2009 – March 2010)*

- Research and drafting assistance for expert testimony on energy efficiency' as an alternative to the White Bluff Steam Electric Station before the Public Service Commission of Arkansas, Docket No. 09-024-U.

Training for NGOs Working on Energy Efficiency Projects in China
ISC and NRDC – United States and China *(August 2008 – September 2010)*

- Developed training materials and provided remote and in-person training sessions on the economic and financial analysis of industrial retrofit projects for structuring and negotiating financial incentive offers to customers;
    - Worked with the Institute for Sustainable Communities (ISC) to aid its efforts to promote energy efficiency in the Guangdong and Jiangsu Provinces (February 2009 – September 2010);
    - Worked with the National Resource Defense Council (NRDC) to aid in its efforts in China, especially in conjunction with a $100 million revolving loan fund from the Asia Development Bank (August 2008- January 2009).

Incentive Calculations for the Project Cost-effectiveness Analysis Tool (CAT)
Efficiency Vermont – Burlington, Vermont *(November 2008 – June 2010)*

- Aided in the design of a new approach to calculating incentives for custom energy efficiency projects based on financing and reaching a desired rate of return;
- Modified CAT's cash-flow projection engine, an Excel VBA system, to accommodate the new approach to incentives.

Vermont's 20-year Forecast of Electricity Savings from Sustained Investment
Efficiency Vermont – Burlington, Vermont *(December 2008 – October 2009)*

- Provided components of final report relating to long-term trends for the environment (climate change, land-use, and water-use), population growth, and governmental regulation;
- Provided additional technical support on electric demand-side savings potential.

Connecticut's Long Term Acquisition Plan
Connecticut Office of the Consumer Council – Connecticut *(August – October 2008)*

- Provided research and support for expert testimony regarding long-range energy-efficiency procurement plan of the Energy Conservation Management Board, on behalf of the Connecticut Office of Consumer Counsel.

Energy Efficiency Plans of BC Hydro and Terasen Gas
BC Sustainable Energy Association and
The Sierra Club - British Columbia, Canada *(October 2008 – March 2009)*

- Provided research and support for expert testimony and technical support on assessment of BC Hydro's long-term DSM plan, before the BCUC, on behalf of the BC Sustainable Energy Association and Sierra Club Canada (November 2008 – March 2009);
- Provided research and support for expert testimony on assessment of Terasen Gas conservation plans before the BCUC, on behalf of the BC Sustainable Energy Association and Sierra Club Canada (October 2008).

Testimony and Proceeding Participation

Forum	On Behalf Of	Docket/Matter	Date	Issues Addressed
California Public Utility Commission	Small Business Utility Advocates	R. 22-02-005. Application of Pacific Gas and Electric Company for Approval of 2024-2031 Energy Efficiency Business Plan and 2024-2027 Portfolio Plan (U 39 M) and associated Matters.	October-22	Issues related to 3-year Energy Efficiency Business Plan
California Public Utility Commission	Small Business Utility Advocates	R. 22-02-005. Application of Pacific Gas and Electric Company for Approval of 2024-2031 Energy Efficiency Business Plan and 2024-2027 Portfolio Plan (U 39 M) and associated Matters.	September-22	Comments on the phase out of gas incentives.
Nova Scotia Utility and Review Board	The Consumer Advocate of Nova Scotia	Matter No. M10473 An Application by EfficiencyOne for Approval of a 2023 – 2025 Demand Side Management ("DSM") Resource Plan	May-22	Historical performance of portfolio, proposed scenarios, affordability, addressing underserved communities, program design, and avoided costs.
Pennsylvania Public Utility Commission	Columbia Gas of Pennsylvania	Docket No. R-2022-3031211. Columbia Gas of Pennsylvania, Inc. 2022 Rate Case Proceeding	March-22	Three-year energy efficiency plan proposal, including projections for costs, savings, and cost-effectiveness.
Ontario Energy Board	Small Business utility Alliance	EB-2021-0002. Enbridge Gas Inc. – Multi Year Demand Side Management Plan (2022 – 2027)	December-21	Analysis of commercial program goals and program design

Forum	On Behalf Of	Docket/Matter	Date	Issues Addressed
California Public Utility Commission	Small Business Utility Advocates	R. 21-02-014. Rulemaking to Address Energy Utility Customer Bill Debt Accumulated During the COVID-19 Pandemic.	April-21	Report on Analysis of Small Business Utility Bill Arrearages in California during COVID-19
Pennsylvania Public Utility Commission	Philadelphia Gas Works	P-2014-2459362, Petition of Philadelphia Gas Works for Approval of Demand-Side Management Plan for FY 2016-2020	October-20	Historical performance of PGW's DSM Phase II Plan and modifications to program design.
California Public Utility Commission	Small Business Utility Advocates	R. 20-08-022 to Investigate and Design Clean Energy Financing Options for Electricity and Natural Gas Customers	July-20	Comments to address options for small business customer
Nova Scotia Utility and Review Board	The Consumer Advocate of Nova Scotia	Matter No. M09096, Efficiency 1 (E1) Application for Approval of 2020 – 2022 Demand Side Management (DSM) Resource Plan	May-19	DSM Investment Levels and Affordability, Usage of Unspent Ratepayer Funding, Rate and Bill Impacts, Target Setting.
Pennsylvania Public Utility Commission	UGI Gas Utilities Inc. – Gas Division	R-2018-3006814, UGI Gas Utilities Inc. – Gas Division, Rate Case	January-19	Energy Efficiency & Conservation Plan and Total Resource Cost Implementation.
Pennsylvania Public Utility Commission	UGI Utilities, Inc. – Electric Division	M-2018-3004144, Petition of UGI Utilities, Inc. – Electric Division for Approval of Phase III of Its Energy Efficiency and Conservation Plan	August-18	Electric energy efficiency and conservation plan development, projections, implementation, and EM&V.
Pennsylvania Public Utility Commission	Peoples Natural Gas Company	M-2017-2640306, Petition of Peoples Natural Gas Company LLC for Approval of its Energy Efficiency and Conservation Plan	January-18	Energy efficiency study, energy efficiency & conservation plan, and total resource cost implementation.
Pennsylvania Public Utility Commission	UGI Penn Natural Gas, Inc	P-2016-2580030, UGI Penn Natural Gas, Inc. Rate Case	January-17	Energy efficiency & conservation plan and total resource cost implementation.
Pennsylvania Public Utility Commission	UGI Utilities, Inc.	P-2015-2518438, UGI Utilities, Inc.- Gas Division Rate Case	January-16	Energy efficiency & conservation plan and total resource cost implementation.

Forum	On Behalf Of	Docket/Matter	Date	Issues Addressed
Pennsylvania Public Utility Commission	Philadelphia Gas Works	P-2014-2459362, Philadelphia Gas Works Demand-Side Management Plan for FY 2016-2021	May-15	Analysis of Phase I DSM Plan and design of Phase II DSM Plan.

Publications

Love, Theodore. J. Nunley. "Using Smart Thermostats to Engage Residential Customers and Drive Comprehensive Retrofit Projects" In *Proceedings of the ACEEE 2020 Summer Study on Energy Efficiency in Buildings*, Washington, D.C.: American Council for an Energy Efficient Economy.

Love, Theodore. "The Future for Residential Gas Efficiency is Combined". *Strategies*. Association of Energy Service Professionals. January 11, 2019.

Love, Theodore. "Using Open Data to Predict Energy Usage: What tax lot data can tell us about energy usage intensity in New York City". *Behavior Energy, and Climate Change Conference 2015*. Sacramento, CA

Plunkett, John, Theodore Love, Francis Wyatt. "An Empirical Model for Predicting Electric Energy Efficiency Acquisition Costs in North America: Analysis and Application". In *Proceedings of the ACEEE 2012 Summer Study on Energy Efficiency in Buildings*, #906, Washington, D.C.: American Council for an Energy Efficient Economy.

Gold, Elliott, Marie-Claire Munnelly, Theodore Love, John Plunkett, Francis Wyatt. "Comprehensive and Cost-Effective: A Natural Gas Utility's Approach to Deep Natural Gas Retrofits for Low Income Customers." In *Proceedings of the ACEEE 2012 Summer Study on Energy Efficiency in Buildings*, #442, Washington, D.C.: American Council for an Energy Efficient Economy.

Education

Clark University – Worcester, MA
B.A. Magna cum Laude, *Mathematics and Computer Science*, 2006.
Study Abroad Program, Spring Semester 2005 (Kansai Gaidai University: Osaka Japan)

General Assembly: New York City, NY
Data Science Intensive Course, 2015

BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

PETITION OF UGI UTILITIES, INC. – ELECTRIC DIVISION
FOR APPROVAL OF PHASE IV OF ITS
ENERGY EFFICIENCY AND CONSERVATION PLAN

DOCKET NO. M-2023-3043230

REBUTTAL TESTIMONY
OF
THEODORE M. LOVE

UGI ELECTRIC STATEMENT NO. 1-R

December 22, 2023

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I. INTRODUCTION

Q. Please state your full name, occupation, and business address.

A. My name is Theodore M. Love, and I am a Partner at Green Energy Economics Group, Inc. ("GEEG"), an energy consulting firm founded in 2005. My business address is 2534 Downingsville Rd., Lincoln, VT 05443.

Q. Did you previously submit testimony in this proceeding on behalf of UGI Utilities, Inc. – Electric Division ("UGI Electric" or the "Company")?

A. Yes. I submitted my direct testimony, UGI Electric Statement No. 1, on September 21, 2023.

Q. Would you please describe the purpose of your rebuttal testimony in this proceeding?

A. My rebuttal testimony responds to certain portions of the direct testimony submitted by other parties concerning UGI Electric's proposed Phase IV Energy Efficiency and Conservation ("EE&C") Plan ("EE&C Plan" or "Plan"), specifically: (1) OSBA Statement No. 1, the direct testimony of Robert D. Knecht submitted on behalf of the Office of Small Business Advocate ("OSBA"); and (2) OCA Statement 1, the direct testimony of Stacy Sherwood submitted on behalf of the Office of Consumer Advocate ("OCA").

Q. Are you sponsoring any exhibits with your rebuttal testimony?

A. Yes. I am sponsoring UGI Electric Exhibits TML-1R through TML-10R.

II. OSBA WITNESS KNECHT

Q. What recommendations does Mr. Knecht make regarding the Company's Phase IV EE&C Plan?

A. On page 18 of his direct testimony, Mr. Knecht makes the following recommendations:

(1) The Company should modify its forecasts for the Direct Install program to reflect providing EE&C services to businesses of all sizes within the Class 2 rate group;

(2) The Company should reduce utility costs associated with the Class 2 charges by reducing programs, modifying programs to target smaller projects, and shifting cost responsibility to the participants who benefit from the programs;

(3) The Company should retain per-MWh limits on incentive costs and administrative costs for the C&I programs, and apply those costs separately on an average basis to both Class 2 and Class 3; and

(4) The Plan should be modified to reflect reasonable net-to-gross values.

Q. On page 2 of his direct testimony, Mr. Knecht claims that "the number of smaller C&I customers who would benefit from the EE&C Plan remain a tiny fraction of all C&I customers." Do you agree with this assertion?

A. No. The program is not designed to reach all customers at once, which would be extremely expensive for ratepayers. Instead, it is designed to reach approximately 0.5% savings as a percent of sales each year, which is close to Act 129 EDC goals.

I also do not agree with Mr. Knecht's characterization of how few customers the C&I Incentive Program reaches. The Prescriptive Pathway has projections of 330 units per year. Assuming three units per customer, this would be 110 customers served per year, or 550 customers over five years, which would be 7.1% of the approximately 7,700 Class 2 customers. In addition, not every Class 2 customer will be seeking new lighting fixtures every year, which means the C&I Incentive Program would capture a larger portion of eligible customers than implied by the number of total customers in UGI Electric's territory.

The nature of ratepayer funded energy efficiency programs, such as this voluntary program or the Act 129 programs, is to effect sustained, incremental change. The C&I Incentive Program should not seek to flood the market. It should target reasonable incremental goals, such as what the Phase IV Plan is projected to achieve.

Q. Mr. Knecht also states that the "new programs have features that would make it simpler and more economically attractive for smaller customers to take advantage of the EE&C program largesse." (OSBA St. No. 1, p. 2.) Do you have any response to this statement?

A. Ultimately, Mr. Knecht appears to agree with the Company's objective to target smaller customers for program benefits. The Phase IV C&I Incentive Program has been specifically designed and projected to get more savings from, and reach more, small business customers than previous phases. While it may cost more to reach

more small business customers than larger customers, these costs are reasonable and incremental to achieve the Plan's goals.

Q. On pages 5 to 6 of his direct testimony, Mr. Knecht claims that the UGI Electric EE&C program should be subject to additional regulatory scrutiny, compared to other Electric Distribution Companies ("EDC"), "to ensure that costs are prudently incurred" because the Company has "less strong" incentives for economic efficiency as compared to larger EDCs and "is not subject to the strictures of Act 129, notably the target savings levels and the penalties for non-performance." Please respond.

A. I do not agree with Mr. Knecht's assertion that UGI Electric has inadequate incentives regarding the prudent incurrence of costs. Although UGI Electric is not subject to Act 129, the Company has previously agreed to caps on $/MWh spending for incentives and administrative costs and has shown that it is able to stay within these predefined thresholds. Mr. Knecht's own direct testimony acknowledges this fact (OSBA St. No. 1, p. 10). At the end of the day, UGI Electric is still subject to regulatory review and approval of its costs, and, therefore, has sufficient incentive to ensure that its programs are cost effective.

Q. On page 6 of his direct testimony, Mr. Knecht states that the Company's administrative costs "per MWh saved were materially higher than those for other Pennsylvania EDCs, presumably due to the diseconomies of scale for a small utility." Do you agree with this statement?

A. While this might have been true for Phase I or Phase II of UGI Electric's energy efficiency programs, UGI Electric has kept costs considerably lower on a per MWh basis in Phase III, as Mr. Knecht has pointed out (OSBA St. No. 1, p. 10). A large part of keeping costs lower in Phase III has been the participation of the large warehouse projects as described further in Section III of this testimony. UGI Electric anticipates a shift away from these larger individual projects in Phase IV, which will require additional administrative costs.

A. Direct Install Pathway

Q. What modifications does Mr. Knecht recommend for the Direct Install Pathway?

A. Mr. Knecht recommends that the "Company develop an alternative that (a) has lower overall cost, and (b) focuses on smaller customers within the Class 2 rate class group." (OSBA St. No. 1, p. 14.)

Q. Does Mr. Knecht state that the Company's projected incentive costs and administrative costs for the Direct Install Pathway are within the existing limits?

A. Yes. On page 15 of his direct testimony, Mr. Knecht observes that "for the Combined Class 2 and Class 3, both the incentive costs ($99 per MWh) and administrative cost ($98 per MWh) are within the existing limits." In addition, on page 13 of his direct testimony, Mr. Knecht notes that the "Company's proposed Direct Install pathway is a simpler and more economically attractive alternative to the Custom Installation program, limited to customers in Class 2."

Q. On page 14 of his direct testimony, Mr. Knecht states that it "is somewhat surprising" that the Company forecasts the average first-year savings per project will be 118 MWh, considering "the *total* annual load is 5 MWh for an average GS-1 customer, and 49 MWh for an average GS-4 customer." Have you reviewed the Company's forecasted savings per project in light of this statement?

A. Yes, and I have three recommendations based on my review of the Plan's projections:

(1) A correction should be made to a reference error in the formula for calculating the maximum number of small business participants per year in the Direct Install Pathway. The reference error led to an overestimation of the maximum number of participants per year.

(2) The average project size used for the Direct Install Pathway projections should be revised to have savings levels of approximately 24 MWh to reflect potential participants from UGI Electric's Class 2 customer base more accurately.

(3) Administration costs should be updated to reflect the smaller project sizes and lower participation numbers.

Q. Please describe the reference error you found and its implications for the Direct Install Pathway projections.

A. The Company used a formula that estimated the maximum number of direct install projects in a given year based on a specified savings target. Instead of dividing this savings target by the average savings per project, the formula referenced the average incentive per project. This had the effect of estimating many more projects per year than would be implied by the savings target. Correcting this error will significantly reduce the amount of savings projected from the Direct Install Pathway, as well as reduce the cost attributable to Class 2 customers, as Ms. Bassininsky shows in her rebuttal testimony (UGI Electric St. No. 2-R).

Q. Please describe how the Company calculated the 118 MWH per project savings assumption.

A. UGI Electric used an incremental cost per project of $46,521, which was based on the incremental cost of a small C&I "Lighting Improvement" project from PPL

Electric Utilities Corporation's ("PPL") Act 129 Phase IV Plan filing.[1] This was assumed to be the typical project size at PPL for the types of projects that UGI Electric expected to see in its proposed Direct Install Pathway. There were no obvious savings values associated with this incremental cost in the PPL filing.

To calculate savings per project, UGI Electric used an average incremental cost per kWh of $0.395, which was calculated based on historical Class 2 participants in its current C&I Custom Incentive Program. The average project size of $46,521 was then divided by the $0.395 cost per kWh to get the 118 MWH in savings.

Q. Is this a reasonable approach to characterizing a direct install project?

A. Yes, this is a reasonable approach if the Direct Install Pathway is expected to have the same kind of small C&I customer projects as PPL. After closer examination, it appears that PPL's definition for small C&I is larger than what is represented in UGI Electric's Class 2. After confirming Mr. Knecht's calculation of the average usage of Class 2 customers, I agree that the current project size is generally larger than what the UGI Electric Class 2 customers would be pursuing.

Q. What do you recommend that UGI Electric use for kWh savings per project under the Direct Install Pathway then?

A. I believe that 24,121 kWh in savings per project is a reasonable assumption for projection purposes. To arrive at this figure, I analyzed the range of savings from

[1] Docket No. M-2020-3020824. PPL Exhibit 1, Section 3 Program and Component Descriptions, Table 42.

C&I Custom projects performed by Class 2 customers in Phase III to produce the following table.

Table 1.Phase III – Small C&I Project Savings Characteristics.

Annual Savings (kWh)	
Min	1,300
1st Qrt	5,568
Median	10,202
3rd Qrt	24,121
Max	193,595
Avg	21,395

I used the 3rd quartile value for savings of 24,121 kWh, which indicates that 75% of historical projects were smaller than this and 25% were larger. I chose the 3rd quartile since the Direct Install Pathway is intended to serve larger and more comprehensive projects, while smaller projects will be served under the Prescriptive Pathway.

Q. What updates do you suggest for administrative costs?

A. I recommend that the marketing budgets be adjusted downwards to reflect the lower participation and that variable costs associated with the Direct Install Pathway projects be adjusted lower to account for the smaller sizing of the Direct Install Pathway projects.

Q. Have you performed any analysis on the impacts of your two recommendations?

A. Yes. I have modified the portfolio projections to account for the previous recommendations. The recommended updates reduce the overall savings coming

from the Direct Install Pathway and, as a result, from the C&I Incentive Program and overall portfolio as well. The average project size for a Direct Install Pathway project is also lower, as are administrative costs on a per project basis. Under the revised projections, UGI Electric estimates 55 direct install projects over five years, instead of the original 93. I have prepared another workpaper, which compares the projections from the original plan and the updated projections. Below is a high-level comparison of the originally filed C&I Incentive Program projections for Phase IV compared to the updated projections.

Table 2. C&I Incentive Program Projections for Phase IV
(Filed vs. Direct Install Pathway Update)

Benefit/Cost Component	**Filed**	**Updated**
Savings (MWh)	19,804	10,190
Capacity Savings (MW)	3.158	1.718
Total Resource Cost	$8,441,903	$3,526,389
Direct Participant Cost	$4,539,795	$1,599,658
Direct Utility Costs	$3,902,108	$1,926,731
Customer Incentives	$1,969,208	$815,581
Administration	$1,557,900	$986,150
Marketing	$375,000	$125,000

The C&I Incentive Program, if updated, would cost approximately $2.0 million less over five years and save approximately 9,614 less MWh. The large drop in savings and most of the drop in costs are due to the C&I Incentive Program acquiring significantly less savings from the Direct Install Pathway.

The following table shows the change in costs for the overall portfolio.

Table 3. Phase IV Budget Projections (Filed vs. Direct Install Pathway Update)

Customer Class	Filed	Updated
Residential	$4,825,550	$4,825,550
C&I	$3,902,108	$1,926,731
Portfolio-wide	$1,745,000	$1,745,000
Total	**$10,472,658**	**$8,497,281**

The overall portfolio is projected to cost 19% less, given that the Residential portion of the portfolio does not change. This also makes the C&I portion 23% of the overall portfolio spending, down from 37%, which would also reduce the portion of the Portfolio-wide costs allocated to C&I customers.

Q. How do the recommended updates affect the C&I Incentive Program's cost effectiveness?

A. As a result of the changes, the C&I Incentive Program is projected to be more cost-effective, as shown in the following table.

Table 4, C&I Incentive Program Projected TRC Test Results for Phase IV (Filed vs. Direct Install Pathway Update)

TRC Test	Filed	Updated
NPV Benefits	$15,410	$8,129
NPV Costs	$7,082	$2,974
Net Benefits	$8,328	$5,155
TRC Benefit/Cost Ratio	2.18	2.73

The overall Total Resource Cost ("TRC") net benefits drop due to the reduction in overall spending; however, the program-level benefit-cost ratio ("BCR") improves since the C&I Incentive Program is weighted less heavily towards the direct install projects, which have a lower BCR than the prescriptive projects.

The improvement in overall BCR would flow through to the portfolio level, as shown in the following table.

Table 5. Phase IV Budget Projections (Filed vs. Direct Install Pathway Update)

Component	Filed	Updated
TRC Benefits	$31,649,450	$24,369,038
TRC Costs	$14,132,521	$10,024,957
TRC Net	$17,516,929	$14,344,081
TRC BCR	2.24	2.43

Both benefits and costs come down, but the overall BCR for the portfolio improves to 2.43.

Q. How do the recommended updates to the Direct Install Pathway affect rates for Class 2 and Class 3 customers?

A. Ms. Bassininsky outlines the impacts that this update would have on rates in her rebuttal testimony (UGI Electric St. No 2-R) on page 4. Generally speaking, Class 2 would have an approximately 50% drop in the EE&C surcharge, while Class 3 would see a 20% increase due to a higher portion of administrative costs being borne by this rate class. Residential customers would see a small increase due to a higher allocation of portfolio-wide costs.

Q. How do the recommended updates affect savings acquisition costs?

A. The following table compares the nominal cost per MWh over the Phase IV EE&C Plan broken out for the C&I Incentive Program.

Table 6. C&I Incentive Program Projected Savings Acquisition Costs for Phase IV (Originally Filed vs. Direct Install Pathway Update)

Acquisition Costs	Filed	Updated
Total $ / MWh	$197	$189
Incentive $ / MWh	$99	$80
Non-incentive $ / MWh	$98	$109

Overall costs per MWh go down slightly to $189 per MWh due to an increase in non-incentive costs per MWh being offset by a larger drop in incentive costs. The drop in incentive costs comes from the C&I Incentive Program becoming more weighted to the lower incentive levels in the Prescriptive Pathway. Non-incentive costs go up since the variable cost per project from smaller direct install activities is still higher than previously estimated, as well as fixed administration costs being spread out over less savings. The projected costs are also still below the thresholds of $100 per MWh for incentives and $110 per MWh for non-incentive costs that were proposed by Mr. Knecht.

B. Per-MWh Limits on Incentive Costs and Administrative Costs for the C&I Programs

Q. What does Mr. Knecht recommend regarding per-MWh limits on incentive costs and administrative costs for the C&I programs?

A. On page 15 of his direct testimony, Mr. Knecht recommends that, regarding the caps on C&I costs, "that the current restrictions remain in place as a class average limit, and that they be applied individually to Class 2 and Class 3," asserting that "[w]hen viewed on a class basis, the incentive costs exceed the limit for Class 2, due primarily to the relatively higher incentives offered in the Direct Install

Program." He also asserts that the caps on C&I costs are not unreasonable because "the $100 MWh limit on incentives represents a 62 percent increase over the Phase III actual costs, and the $110 per MWh limit on administrative costs is a 40 percent increase over Phase III actual." (OSBA St. No. 1, pp. 15-16.)

Q. Do you agree with these recommendations?

A. No. The proposal for Phase IV is fundamentally different for two reasons. One is an anticipated drop-off in large projects along the I-80 corridor. The second is the introduction of the Direct Install Pathway to address opportunities within the small business sector more comprehensively.

Historically, a large portion of the C&I Custom Program's savings have come from lighting projects at warehouses along the I-80 corridor. Driven by demand for warehousing items for delivery to the greater New York and New Jersey area, UGI Electric has seen a large growth in the amount of warehouse space in its territory. UGI Electric has been able to work closely with developers of these warehouses to make sure that the lighting in these buildings is energy efficient. Given the size of the buildings, each individual project represents a substantial portion of the program's savings activity. Relative to their savings, these projects have had low administrative acquisition costs. Through conversations with stakeholders in the region, UGI Electric believes that there are not many more existing warehouses that can be addressed and that new warehouse construction has slowed down. Given these market trends, the Company anticipates the need to find

new avenues to produce energy savings, which has led to the development of the Prescriptive Pathway and Direct Install Pathway.

As Mr. Knecht has pointed out in his testimony, UGI Electric's nonresidential customer base is generally smaller than many other EDCs in the Commonwealth. Addressing these customers is more challenging and is more costly. Primarily, smaller commercial customers require additional assistance with the upfront cost of efficiency, which means higher incentives. Smaller projects also mean higher administrative costs per project. For example, if 10 smaller projects have the same savings as 1 large project, but all projects have approximately the same administrative costs associated with them, then the administrative cost for the same amount of savings will be about 10 times higher for the small projects in total. As a result of this dynamic, the Phase IV projections anticipate a move towards smaller projects and higher per project administrative costs per MWh saved.

Not only do smaller business customers have smaller projects, these customers also require additional technical assistance. The Direct Install Pathway has an estimated cost of up to $3,000 to provide an assessment report on the savings opportunities within a customer's business. This is a real benefit to the customer, and something that they would need to pay for on their own if they were attempting to do a more comprehensive project. Not only does technical assistance at the beginning of a project assist smaller customers, so does the inspection on the back end. Smaller customers appreciate having a third party inspect the work to make sure that what was promised to be delivered was delivered. The inspection can catch commissioning issues that the customer may not have been aware of and can help

make sure that the actual outcomes of a job are realized. In the updated C&I Incentive Program projections, over 25% of the administrative costs are going to assessments and inspections. Even though these costs are not considered an incentive under Act 129,[2] this is a real and necessary benefit to help smaller customers who lack the time, money, and/or experience to determine this information on their own.

Q. Does Mr. Knecht reconcile his recommendations regarding limits on incentives and administrative costs for the C&I programs with his observation on page 11 of his direct testimony that "the per-MWh incentive costs and administrative costs that will be borne by other ratepayers remain at levels consistent with the past, and with the settlement of the Phase III proceeding"?

A. No. His previous implication that UGI Electric would spend wildly seems to have not been born out. However, if my recommended updates to the C&I Incentive Program projections are made, the projected costs would be higher than the current filed EE&C Plan costs but still within the range of costs to acquire savings projected by the other larger Act 129 EDCs, as previously pointed out.

Q. Do you agree with Mr. Knecht's recommendation to assign incentive caps separately to Class 2 and Class 3 customers?

A. No. I find that this requirement does not square with Mr. Knecht's statement on page 12 of his direct testimony, where he "agree(s) with the Company that it should

[2] The Act 129 TRC Test clearly considers technical assessments an administrative cost (see 2021 Total Resource Cost Test Order dated December 19, 2019. Docket No. M-2019-3006868. Section D.1).

make a greater effort to encourage more small business customers from the EE&C C&I Programs."

Even if there were a cap assigned for the overall program, Mr. Knecht's caps for Class 2 and Class 3 customers do not make sense. He has already shown in Table RDK-1 that the Phase III Program was over these caps for the Small C&I (Class 2) customers. I do not believe that lowering these caps for Class 2 below what the company has already achieved will help get additional Class 2 customers to participate. Instead, I expect those caps will reduce the reach of these programs with small businesses. Furthermore, these caps are lower than the projected cost to achieve from the other EDCs in Pennsylvania, which have much better economies of scale by which to reduce overall costs, as shown by the following table. The following table provides the Act 129 EDCs' projected acquisition costs from their Phase IV EE&C Plans for small C&I.

Table 7. Act 129 EDCs' Projected Phase IV Acquisition costs for Small C&I Sector

EDC	**Acquisition Cost$/MWh**
PECO	$243
PPL	$134
DQL	$275
FE-MetEd	$290
FE-Penelec	$250
FE-PP	$220
FE-WPP	$260
Total (Avg)	**$239**
UGI – C&I Program (Class 2)	**$224**

The average acquisition cost per MWh of $239 is higher than Mr. Knecht's proposed $210 cap for UGI Electric.

Q. Is the overall program cap level proposed by Mr. Knecht reasonable?

A. No. As pointed out, changes in the warehouse market and the shift in programming needed to acquire new savings necessitate both higher incentives and administrative costs. Mr. Knecht also ignores the inflationary pressures placed on acquisition costs, especially given that inflation rates have been significantly elevated since the original Phase III filing. Finally, caps placed on acquisition costs are unnecessary and inconsistent with the principles of Act 129. Even though this is a voluntary program not subject to Act 129, it still follows the same principles, namely that it is shown to be cost-effective on a TRC Test basis and that overall budgets are limited by filed projections. By Mr. Knecht's own testimony, UGI Electric has shown that the Company can deliver on its historical promises regarding cost controls and that future caps, beyond those on overall budgets, are not necessary.

C. Prescriptive Pathway

Q. What modifications does Mr. Knecht recommend for the Prescriptive Pathway?

A. Mr. Knecht recommends that the Company "modify the incentive levels to improve the contribution from participants (and thus reduce the burden on non-participants)," specifically to reduce the incentive to 3 cents per kWh saved and increase the participant cost to about 44% of program cost, which would keep the payback period for the customer at less than 6 months. (OSBA St. No. 1, p. 13.)

Q. What is the basis for Mr. Knecht's recommendation?

A. Mr. Knecht states that he has two concerns about the Prescriptive Pathway, specifically: (1) "the Company has not explained how the program will be different from the Appliance Rebate program in Phase I which proved to be uneconomic"; and (2) "the incentives appear to be unduly generous" because the participant contribution is "unduly low" considering the variable charge for electricity, payback period for the customer, and the lifespan of the investment. (OSBA St. No. 1, p. 13.)

Q. Do you share his concerns with the comparison to the Appliance Rebate Program?

A. No. As explained in my previous testimony, the Prescriptive Pathway will initially address lighting measures, which have been proven to be extremely cost effective, both in UGI Electric's previous program and from other EDC programs in Pennsylvania and beyond. The Appliance Rebate Program referred to by Mr. Knecht was a stand-alone program that addressed non-lighting electric appliances, such as refrigeration and HVAC measures. UGI Electric will be careful to maintain the cost effectiveness of the C&I Incentive Program if additional non-lighting measure incentives are provided.

Q. Do you agree that program costs should be limited, as recommended by Mr. Knecht?

A. No. The greatest barrier to getting smaller customers to pursue energy efficiency is overcoming the incremental up-front cost to do so. UGI Electric's proposed incentive rates are not far off from those offered by other EDCs in Pennsylvania, with PPL, Metropolitan Edison Company ("Met-Ed"), Pennsylvania Electric Company ("Penelec"), Pennsylvania Power Company ("Penn Power"), and West Penn Power Company ("West Penn") all offering $0.05 per kWh for lighting.

In comparison, Mr. Knecht's proposed incentive rate is nearly half of what other EDCs are offering in Pennsylvania. Introducing an incentive limit, as proposed by Mr. Knecht, would not only make it harder for small businesses to pursue energy efficiency, but it would also make them less competitive than other businesses in a neighboring EDC's territory, due to both the ability to pursue energy efficiency and the operational savings from pursuing energy efficiency.

E. Net-to-Gross ("NTG") Values

Q. Does Mr. Knecht make any recommendations for how the Company should modify the plan to reflect reasonable net-to-gross values?

A. Yes. On page 8 of his direct testimony, Mr. Knecht recommends that the Company apply an NTG ratio of 0.7 to align with PPL Electric's current NTG value.

Q. Do you agree with this recommendation?

A. No. For an NTG ratio to provide meaningful results, it should be based on an actual study of the effects from a specific program, not a proxy value from a separate program serving a different customer base. As discussed elsewhere in this testimony, a small business participant in PPL's programs is different from a small business participant in UGI Electric's programs.

Q. If the Company were to adopt the usage of NTG ratios, how should they be utilized?

A. First, it should not be a blanket "modification" to the Plan, as suggested by Mr. Knecht. Instead, to be consistent with how Act 129 uses NTG ratios, both gross and net TRC test results should be presented. Gross results should be used for compliance with plan projections, and net results should only be used for general planning purposes. Second, the NTG ratios that are used should be based on NTG studies of UGI Electric's programs. Until such studies are performed, and to the extent that the Commission deems it necessary to apply an NTG ratio to UGI Electric's voluntary program at this time, UGI Electric should continue to utilize an NTG ratio of 1.0 as agreed to in the settlement of its Phase III Plan.

Q. Are there downsides to calculating NTG ratios for UGI Electric's programs?

A. Yes. There is always a cost to perform these studies, which generally requires direct interviews of both program participants and non-participants. Additionally, acquiring the correct sample size of responses to provide a statistically significant

result can be challenging. UGI Electric's programs are relatively small. The smaller the pool of participants, the larger the portion of that pool must be included in the sample to get results with an acceptable margin of error, and the greater the administrative costs that will be associated with undertaking such a study.[3]

III. OCA WITNESS SHERWOOD

Q. Please summarize Ms. Sherwood's recommendations regarding the Company's Phase IV EE&C Plan.

A. On pages 27 to 29 of her direct testimony, Ms. Sherwood makes the following recommendations:

(1) Should the Company want to continue offering the programs as proposed, it should justify the continuation of energy efficiency kits, provide evidence of how it will achieve the forecasted higher participation levels of the Appliance Rebate Program and the Low-Income Program, and provide justification for the decreased program administration costs from historical levels;

(2) The Commission should not approve the proposed Plan due to the overreliance on energy kits and unrealistic savings projections. In the alternative, the Company should be required to include a weatherization audit and rebate program in its Plan or address in rebuttal testimony the alternative measures it would support;

(3) The Company should discontinue offering natural gas efficiency measures to promote electric to natural gas fuel switching. The Commission should not approve

[3] For example, targeting a 90% confidence at +/-10% precision for a population of 100 requires a sample size of at least 41, or 41%, a population of 1,000 requires a sample size of at least 64, which is only 6.4% of the population.

the Plan with fuel switching measures that move customers away from electricity to natural gas; or in the alternative, the Commission should disallow fuel switching measures as part of the Plan approval;

(4) The Company should encourage customers to consider weatherization measures, particularly those seeking heating, ventilation, and air conditioning ("HVAC") upgrades, regardless of whether the program offers weatherization rebates or audits to promote proper sizing of HVAC equipment, and the promotion of weatherization should be provided via marketing materials, including the Company's website and the rebate application;

(5) The Company should provide contractor training on the importance of properly sizing equipment and promoting weatherization to occur prior to the installation of HVAC equipment, and encourage contractors to convey this information to participants as part of the sales pitch for the HVAC equipment, and consider providing an incentive to contractors to ensure that weatherization occurs prior to the installation of the rebated HVAC equipment;

(6) Approval of the Plan should be conditioned on an evaluation of whether the Appliance Rebate Program measures are eligible for tax credits or rebates under the Inflation Reduction Act ("IRA"). If so, the Company should notify customers through its website and any marketing and rebate materials that they are eligible to receive IRA tax credits or rebates. The Company also should be directed to identify those measures that do not meet IRA eligibility requirements and notify participants that they are not eligible to receive tax credits or rebates for those measures;

(7) The Company should conduct a sensitivity analysis of the Plan to reflect historical participation, spending levels, and the potential popularity of electrification measures as an impact on IRA funding. This analysis should indicate the impact on cost, savings, program cost-effectiveness, and overall portfolio cost-effectiveness;

(8) The Company should highlight the means by which it will achieve the forecasted participation levels, with specific language on how it plans to expand program eligibility to address low-income and disadvantaged customers within its service territory. The Company also should consider offering a more comprehensive program for low-income customers, such as offering weatherization measures, and/or expand the measure offerings to include heat pumps for homes with electric resistance heating; and

(9) For a potential Phase V Plan, the Company should be required to evaluate actual Plan IV results using a formal evaluation, measurement, and verification ("EM&V") process and file a report once per plan term on a predetermined cycle; specifically, the first two years of the Phase IV programs should be conducted in time for the results to inform the Phase V plan development.

Ms. Sherwood also expresses some general concerns regarding the Plan's cost-effectiveness and ability to meet future goals. However, nearly all of her recommendations would provide additional impediments to the portfolio's long-term cost-effectiveness. These include removing kit programs, providing additional contractor training, and moving towards weatherization rebates. Thus, I find it

difficult to reconcile Ms. Sherwood's recommendations for the Plan with her concerns about the Plan's cost-effectiveness.

A. Projected Participation Levels for Residential Programs

Q. Please summarize Ms. Sherwood's concerns related to the Company's energy savings goals for its Phase IV EE&C residential programs based on current and past participation. (OCA St. 1, pp. 9-11.)

A. Ms. Sherwood has two main concerns outlined on pages 9 to 11 of her testimony regarding the Company's energy savings goal projections. First, Ms. Sherwood believes that the participation forecasts for the Appliance Rebate Program are too optimistic and should be adjusted downward, while still maintaining overall cost effectiveness. And second, Ms. Sherwood argues that money spent on energy saving kits is not beneficial because of the lower in-service rates for the measures within the kits.

Q. What does Ms. Sherwood recommend regarding the Company's projected participation levels for residential programs?

A. Ms. Sherwood recommends that the Company revise projections to be lower and more in line with historical program participation trends.

Q. Do you agree with Ms. Sherwood's concerns and recommendation regarding the Company's projected participation levels for the residential programs?

A. No. I believe the projections for participation in the residential programs are reasonable and obtainable, as I explain below.

Q. How does the Company plan to achieve its projected higher participation levels of the Low-Income Program?

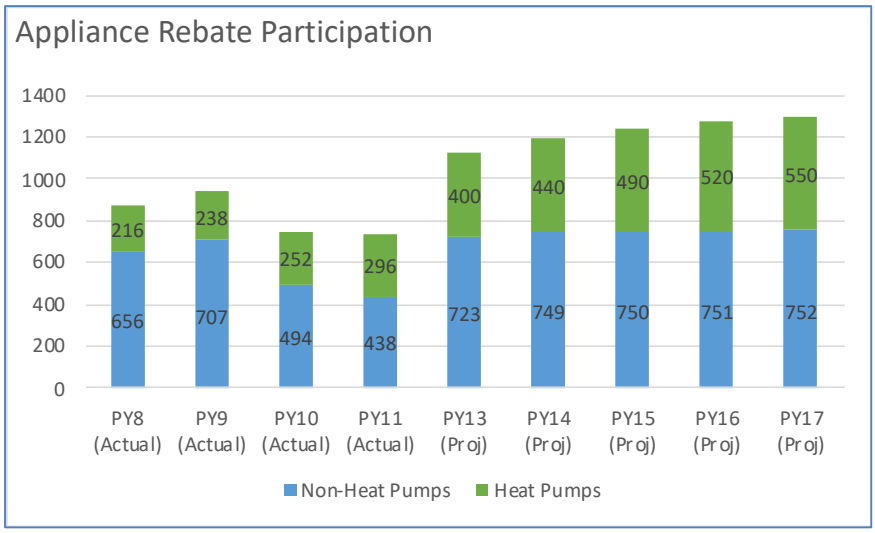
A. The Low-Income Program is projected to achieve ten participants per year, which is the same level of participation that the Company has experienced in the past. Ms. Sherwood asserts on page 24 of her testimony that the Company has only installed a single heat pump water heater ("HPWH") in PY10 and PY11. This is true for PY10. However, while reviewing this claim for PY11, the Company found an inadvertent error where the number of heat pump installations and smart thermostat installations were transposed in the PY11 Annual Report. UGI Electric Exhibit TML-1R provides a corrected page from the PY11 Annual Report showing there were actually ten HPWHs installed and only one Smart Thermostat. The error did not impact any cost or savings value.

While the Company was only able to find a single participant in PY10, UGI Electric has since increased its engagement with the Community-Based Organizations ("CBOs") implementing the program and has increased participation levels in PY11. As such, the Company fully anticipates reaching projected participation in PY12 and onward.

Q. Where does the growth in participation projections for the Appliance Rebate Program come from?

A. The main change in program participation levels is due to the growth in rebates for heat pump measures as shown in the following graph.

Figure 1. Appliance Rebate Participation – Heat Pump vs. Other Measures[4]

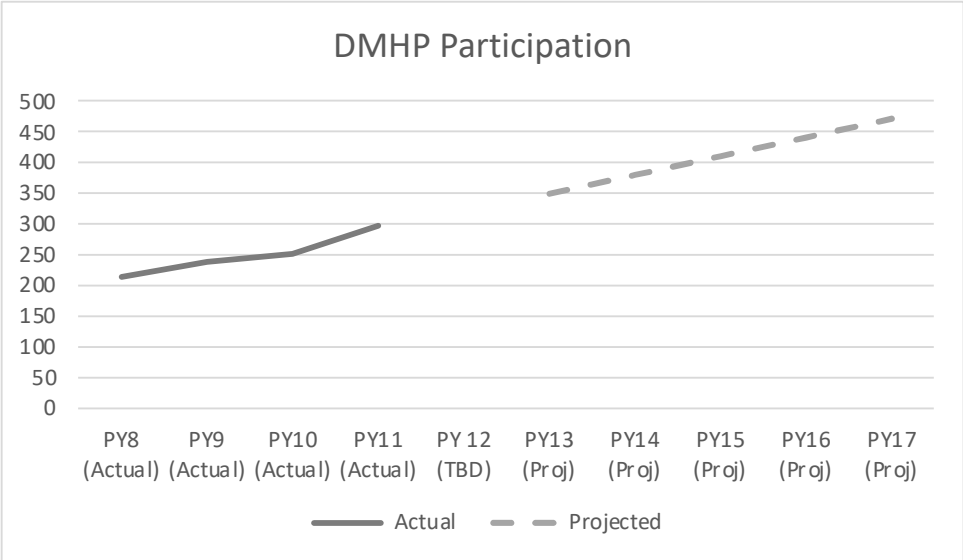


Non-heat pump participation levels are projected to be similar to historical levels, which is in line with Ms. Sherwood's suggestions, and hold steady through Phase IV. Max participation for non-heat pump rebates in PY17 is 752, which is 6% higher than the PY9 level of 707.

The real growth in participation comes from heat pump measures that include ductless mini-split heat pumps ("DMHPs") and two new measures, HPWHs and air-source heat pumps ("ASHPs"). DMHPs have been very popular in UGI Electric's territory and have seen significant growth, a trend that UGI Electric projects to continue, as shown in the following figure.

[4] PY12 data is not yet available.

Figure 2. Actual and Projected Participation for Ductless Minisplit Heat Pumps



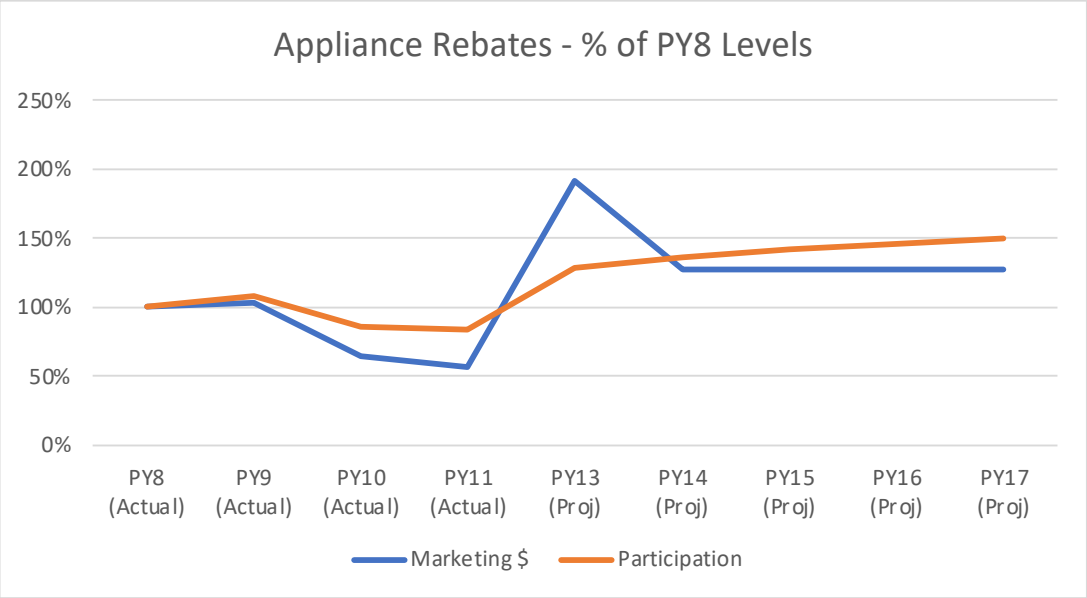
Ms. Sherwood also acknowledges in her response to UGI to OCA-I-9 (UGI Electric Exh. TML-2R) that heat pump technology could be the exception for reaching higher participation numbers due to the IRA.

Q. Are there other factors that support the projected participation levels?

A. Yes. The Company will reach these projected participation levels by utilizing marketing budgets and leveraging tax credits and other incentives offered by the IRA.

Marketing is how customers hear about the rebates offered through the Company's Appliance Rebate Program, which in turn drives participation in the program. It would be expected that marketing spend would correlate with participation rates. This is true for UGI Electric's Appliance Rebate Program, as shown in Figure 3, below, which compares the marketing spend and participation counts as a percentage of PY8 levels.

Figure 3. Comparison of Marketing and Participation Levels in the Appliance Rebate Program[5]



PY9 showed very similar levels of marketing spending and participation levels compared to PY8. As marketing spending dipped in PY9 and PY10, so did the corresponding number of participants. UGI Electric projects a significant jump in marketing spending in PY13, the first year of the new plan, which will be used to launch its expanded heat pump rebate offerings, including educating customers on tax credits offered through the IRA. In PY14 and onward, marketing spending and participation levels return to their historic relationship, with overall higher levels than previous years, as would be expected to achieve higher participation.

As mentioned in the response above, the main drivers of higher participation are the three heat pump measures: DMHPs, ASHPs, and HPWHs. All three of these measures have tax credits of up to $2,000 available under the IRA. I believe it is reasonable to assume that this will increase interest in these measures in UGI

[5] PY12 data has not been reported yet.

Electric's service territory and aid the Company in reaching its projected participation levels.

Q. How does the Company plan to achieve its projected higher participation levels for the Appliance Recycling Program?

A. There have been struggles industry wide for maintaining Conservation Service Providers ("CSP") for Appliance Recycling Programs. Much of UGI Electric's struggles with meeting past participation goals have been due to the past two service providers going out of business mid-plan. UGI Electric is in discussions with a new service provider and expects to be able to deliver on the Appliance Recycling Program in Phase IV with the help of the new service provider.

Q. How does the Company plan to achieve its projected higher participation levels of the School Energy Program?

A. As discussed in my direct testimony, the School Energy Program will be expanding to an additional high school, which has already been identified.

Q. How does the Company plan to achieve its projected participation levels for the Energy Kits Program?

A. As described in Section 2.1.3 of the proposed EE&C Plan (UGI Electric Exh. 1), UGI Electric will launch a website for customers to learn about energy savings opportunities and to allow them to sign up to receive a free energy kit. Also, additional marketing efforts will be utilized to get customers to visit the website.

Q. Ms. Sherwood also asks the Company, as part of its rebuttal testimony, to "indicate how it plans to increase the level of customer incentives spent per year or revise its projections to reflect historical performance." (OCA St. 1, p. 11.) How does the Company plan to increase the level of customer incentives to meet the Plan's projected participation levels?

A. The level of spending on customer incentives will come down to the participation levels projected for the program. As discussed previously in this rebuttal testimony, the largest driver of the incentive level spending will come from the heat pump rebates.

Q. On page 11 of her direct testimony, Ms. Sherwood argues that "[w]hile the Company is currently forecasting the Plan to be cost-effective, changes to participation, spending, and in-service rates could negatively impact the Plan enough to render it not cost-effective." Do you agree?

A. No. First, Ms. Sherwood provides no analysis to support this claim as shown by her response to UGI to OCA-I-1 (UGI Electric Exh. TML-3R). In-service rates are already utilizing evaluated results, as discussed further below, or Act 129 approved assumptions. While a decrease in participation may decrease cost-effectiveness, the Company's plans are currently exceedingly cost-effective. It would require dramatic decreases in both participation and in-service rates to render the EE&C Plan not cost-effective.

Q. Ms. Sherwood claims that "it seems unlikely that the programs will be able to achieve the incentives vs non-incentive ratios projected by the Company for the Plan, particularly if the participation trends from Phase III continue." (OCA St. 1, p. 11.) Do you agree?

A. As I have just described, the projections for the residential programs are all reasonable and attainable. Ms. Sherwood references the impacts of the IRA several times throughout her testimony. The heat pump and electrification incentives being provided by the IRA and the tax credits for such measures included in the IRA are two of the main drivers to the Company's higher levels of participation over historical program participation. The risk may actually be to the upside for participation levels because most of the growth comes from these heat pump measures.

B. Energy Efficiency Kits

Q. Why does Ms. Sherwood recommend that the Company reduce the role of energy efficiency kits in the Plan (OCA St. 1, pp. 22-24)?

A. Ms. Sherwood outlines three concerns that lead her to recommend the Company reduce the role of energy efficiency kits in the Plan. First, Ms. Sherwood argues that the in-service rates being lower than 50% for each measure in the kit is not a good use of rate payer funds because the majority of the money for the kits is being spent on measures that do not end up being installed in the home. Second, Ms. Sherwood argues that the kits rely on secondary savings such as water savings and not electricity savings. Third, Ms. Sherwood is concerned about the saturation level

of energy kits in this service territory given that the Energy Kits Program has already been active for 12 years in the Company's previous EE&C Plans.

Q. Has Ms. Sherwood previously recommended that UGI Electric include energy kits in its Plan?

A. Yes. In her direct testimony in the UGI Electric Phase III Plan filing, at Docket No. M-2018-3004144, she recommended that the Company "(i)nclude initiatives such as home energy reports, **energy efficiency kits targeted for low-income customers**, and online audits as full-fledged program offerings . . ." (OCA St. 1, p. 18) (emphasis added).

Q. Has Ms. Sherwood identified why she is taking a different position in this proceeding regarding energy kits?

A. Ms. Sherwood has not identified the specific reasons for changing her position on energy kits. She may have wanted the chance to evaluate such a program on its own. However, I believe that the many benefits from a standalone Energy Kits Program are clearly provided in this filing, including significant energy savings, water savings, net economic benefits, and a low-cost way for customers to engage with UGI Electric's energy efficiency programs through the cross-promotion of other beneficial customer programs offered by the Company in marketing materials that will be included in the kits.

Q. Has Ms. Sherwood provided any analysis related to the potential impact of reducing the role of energy efficiency kits in the Plan?

A. No, as shown by her response to UGI to OCA-I-3 (UGI Electric Exh. TML-4R).

Q. Do you agree with Ms. Sherwood's concerns regarding the Company's inclusion of energy efficiency kits in its Plan?

A. No. Energy savings kits are a good way to reach many customers with energy saving measures at a lower cost. They are a current part of every Act 129 EDC's EE&C Plan and have had great success and are a standard part of energy efficiency programs across North America. Furthermore, the issue of saturation is not a concern for the UGI Electric program. Yes, it is true that the Company has offered energy saving kits for 12 years. However, the lifetime of the measures provided in the kits is only six years. This means that only the kits provided to customers within the past six years would still be within their measure lifetime, and each year beyond that a new set of customers can receive benefits from energy saving kits.

Q. On pages 21 to 22 of her direct testimony, Ms. Sherwood argues that the Plan is "heavily reliant on kits that have low in-service rates, which means that most of the measures funded through the program are never utilized." Do you agree?

A. No. I would not consider 21% of residential savings to be "heavily reliant," nor does Ms. Sherwood have a specific definition in mind.[6] The Energy Kits Program

[6] *See* response to UGI to OCA-I-18 (UGI Electric Exh.TML-5R).

is only contributing 3.3% of the residential savings, has in-service rates based on Act 129 assumptions, and is included in all the Act 129 EDC portfolios. The School Energy Program has a decade of history of meeting its goals. An evaluation was completed in March of 2023, and the program's projections are based on the evaluated results, as I discuss further in this section. Ms. Sherwood ignores the full range of benefits that both programs provide, especially in performing outreach and educational services around energy efficiency and funneling customers to additional energy saving opportunities. Said differently, this program has widespread benefits that Ms. Sherwood's narrow measurement of efficacy does not fully acknowledge.

Q. Ms. Sherwood recommends that the Company shift resources away from energy efficiency kits to offset other programs such as energy audit costs, weatherization rebates, IRA initiatives, or electrification measures. (OCA St. 1, p. 24.) Do you agree with this recommendation?

A. No. The Energy Kits Program is a modest portion of the overall portfolio budget. Moreover, the program plays an important role in getting customers without school age children to engage with UGI Electric and achieve energy savings, all at a low cost to ratepayers. By contrast, energy audit and weatherization rebate programs generally have lower cost-effectiveness than energy efficiency kit programs due to the costs associated with the level of savings. Secondly, the Company is already providing rebates for the appliance measures included in the IRA. Beyond weatherization, the only additional residential electrification equipment not being

incentivized in the Plan includes EV charging, induction cooktops, and electrical panel upgrades.

Q. On page 8 of her direct testimony, Ms. Sherwood states that "the Company appears to perform an evaluation for its School Energy Program but does not discuss the method for verifying results nor does it file that evaluation with its annual results or in the associated plan docket." How does the Company evaluate the School Energy Program?

A. The Company evaluated the program using the in-service rates, which are calculated based on actual program activity. Specifically, the School Energy Program was evaluated in 2023 and included a review of in-service rate calculations. The evaluation report's section on the School Energy Program is provided as UGI Electric Exhibit TML-6R. The evaluation was performed by a well-known, national third-party evaluation firm, AEG. This is a reasonable method for evaluating the efficiency of this program.

Q. On pages 22 to 23 of her direct testimony, Ms. Sherwood alleges that the Company is not properly evaluating the in-service rate of the School Energy Kits because "there is potential for measures to be installed outside of the service territory or not installed at all but still marked as installed," or later uninstalled "due to low satisfaction with the measure or for other reasons." Do you agree with this statement?

A. While the underlying ideas may have merit, I do not agree with Ms. Sherwood's conclusion. Ms. Sherwood has highlighted some concerns, but does not acknowledge that any attrition may also be offset by spillover within the Company's service territory, or additional energy efficiency actions encouraged by the educational components of the School Energy Program curricula that are not captured under the Act 129 Technical Reference Manual ("TRM"). I recommend that Ms. Sherwood review the evaluation provided as UGI Electric Exhibit TML-6R and provide any further recommendations for future evaluation efforts to be included in the next evaluation scheduled for PY14.

Q. On page 23 of her direct testimony Ms. Sherwood claims that "if it is assumed that a minimum of 50% of the measures are not installed under the two [energy efficiency kit] programs, that would mean approximately $850,000 of the two program budgets fund measures that are not utilized and providing energy savings." What is your response?

A. I disagree with Ms. Sherwood's calculation because it considers administrative costs that may be required regardless of the number of kits installed. Given her 50% assumption, I only calculate $45,000 for kits in the Energy Kits Program and $519,150 for kits in the School Energy Program over five years for kits that have no savings counted due to in-service rates. This comment, again, ignores the educational and marketing benefits that these programs provide, as pointed out previously and acknowledged by Ms. Sherwood.[7] An in-service rate is similar to

[7] *See* response to UGI to OCA-I-17 (UGI Electric Exh. TML-7R).

free-ridership[8] in that the in-service rate alone does not reflect the full savings associated with program activity. Moderate in-service rates alone do not indicate that the program is ineffective. Even with the in-service rates provided, the program still proves to be very cost-effective and provides significant net economic benefits to UGI Electric's service territory.

Q. On page 23 of her direct testimony, Ms. Sherwood asserts that spending on measures with in-service rates lower than 50% is not a reasonable use of ratepayer funds. Please respond.

A. I disagree. Energy efficiency kit programs are the best way to cost-effectively get these lower cost measures into customers' homes. The alternative method to this is to have contractors directly install these measures in a customer's home to ensure higher in-service rates. This method has much higher costs and proves to not be cost-effective. Kit programs are a successful program model utilized across Pennsylvania and North America.

Q. Ms. Sherwood states that she is "concerned about the saturation level of the energy efficiency kit offerings, given the program's longevity and the number of households within the service territory." (OCA St. 1, p. 23.) Do you agree with Ms. Sherwood's concern?

A. No. The School Energy Program kits will only be sent to homes that have school-aged children, which is not the entirety of UGI Electric's residential population.

[8] PPL's School Energy Efficiency Education ("SEEE") program currently has an NTG ratio of 1.0 (PPL PY13 Annual Report. Appendix J-6).

While there may be some overlap with school children in the same household, the implementation CSP rotates through the schools between years to avoid some of this overlap. The School Energy Program has not seen any dramatic downswing in in-service rates over the years, which indicates that there is still a viable market to address with these programs.

For its part, the Energy Kits Program has a very modest projection of 500 kits maximum per year. Over five years, that equates to only 2,500 kits, or 4.5% of UGI Electric's approximately 55,000 residential accounts. Over the 10-year lifetime of the kits, the program would provide kits to less than 10% of UGI Electric's customers if current levels were maintained. I do not believe that this program presents any danger of oversaturating UGI Electric's residential customers.

Q. Ms. Sherwood recommends that energy efficiency kits should be limited to 1 kit per account every 10 years, rather than every 5 years as currently offered by the Company. (OCA St. 1, pp. 23-24.) Do you agree with this recommendation?

A. No. The existing useful lifetime of a measure is the date at which 50% of the installed measures are still assumed to be operational. This means that a not-insignificant portion of customers may want to replace their low-flow devices before the 10-year mark, or they may have changed residences and want to improve the efficiency of their new home. The concern with the 5-year limit is more to make sure that limited program funds go to a wider array of participants. If after five years

the Energy Kits Program still exists, UGI Electric should track the number of repeat customers and it may want to examine their reasons for participating in the program again.

Q. Do you agree with Ms. Sherwood that the inclusion of energy efficiency kits shows that the Plan "focus[es]on secondary methods to achieve electric energy savings, such as through water saving measures and fuel switching"? (OCA St. 1, p. 23.)

A. No. I am not sure what is secondary about water energy savings. Water heating is still an important part of the building sector's load profile. While energy efficiency kits do provide water savings, they also provide electric savings. As described below, fuel switching is also a small part of the overall portfolio.

Q. Ms. Sherwood criticizes the inclusion of water saving measures in the energy efficiency kits, asserting that water saving measures do not result in "deep, long-term energy savings" as compared to weatherization measures or rebating electrification measures. (OCA St. 1, p. 23.) Please respond.

A. While water saving measures do not have as "deep, long-term energy savings" as weatherization or electrification measures, they are still real, important energy savings that last for years. The water savings from low-flow devices are also important benefits in their own rights. Water conservation helps reduce water bills for customers, avoids water infrastructure costs (including energy from waste-water

treatment), and protects water supplies. Ultimately, the kits provide cost-effective energy savings, which is the overall objective of the Company's Plan.

Q. Ms. Sherwood recommends that "the Company should evaluate the potential benefits of offering a more comprehensive program, even if it addresses less customers, to capture the most savings through one program interaction, such as an audit and subsequent installation, rather than through efficiency kits." (OCA St. 1, p. 24.) Do you agree with this recommendation?

A. No. While it is true that other programs may offer more savings per interaction, the overall aggregate savings offered by an energy efficiency kit program are far greater. Furthermore, energy efficiency kit programs serve as a gateway measure to introduce a broad range of customers to the other programs offered by the Company. This will also lead to customers participating in other programs and achieving greater savings offered by the Company.

If the Company were to explore offering additional audit and weatherization measures, it should not be at the expense of the proposed Energy Kits Program. These offerings would be a natural extension of the initial educational interaction from the Energy Kits and School Energy Programs. Eliminating the initial step will make customer acquisition more expensive and may increase free ridership percentages.

C. Fuel Switching Measures

Q. Please explain whether you agree with Ms. Sherwood's general opposition to natural gas fuel switching measures and her recommendation to remove them from the Plan. (OCA St. 1, pp. 17, 19-20.)

A. I disagree and am not aware of any state or Act 129 policy that would prevent fuel switching measures from being included in the Plan.

Q. Has Ms. Sherwood provided any analysis on the potential impact of removing fuel switching measures from the Plan?

A. No.

Q. Are fuel switching measures included in the Commission's current TRM?

A. Yes. Fuel switching measures are outlined in the Commission's current TRM for HVAC on page 71 and Domestic Hot Water Heating on page 142.

Q. On pages 18 to 19 of her direct testimony, Ms. Sherwood claims that "there is no basis for utilizing electric ratepayer dollars to fund conversion from electric to natural gas measures, particularly in a voluntary electric EE&C program." Do you agree with this statement?

A. No. There is a basis for this as it is included in the statewide Act 129 plans and is included in the programs offered by other EDCs, including PPL, as acknowledged by Ms. Sherwood in the response to discovery question UGI to OCA-I-11 (UGI Electric Exh. TML-8R).

Q. Ms. Sherwood also claims that "incentivizing electric to natural gas fuel switching contradicts the effort of the IRA to support and incentivize electrification." (OCA St. 1, p. 19.) Do you agree?

A. While a large portion of the IRA does support and incentivize home electrification through the Home Electrification and Appliance Rebates programs, there is also a portion of the IRA that can incentivize natural gas HVAC equipment and insulation and air sealing measures for natural gas heated homes through the 25C tax credits and the Home Efficiency Rebate program. To state that the IRA solely supports and incentivizes electrification measures is not accurate. Further, there is no basis or requirement that a program offered pursuant to Act 129 must align with federal initiatives such as the IRA.

Q. On page 19 of her direct testimony, Ms. Sherwood recommends that the Company should focus on "providing higher incentives to customers with electric resistance heating . . . to adopt a mini-split heat pump or central heat pump system," rather than fuel switching measures. Do you agree with this recommendation?

A. No, I do not. As always, the Company seeks to propose a range of energy efficiency measures that are cost effective, beneficial to customers, and popular with customers. It is appropriate for the Company to offer programs that reduce customer bills, increase the efficiency of customer behavior, and are based on long-standing analysis, which includes both heat pumps and fuel switching.

Q. Ms. Sherwood claims that "the Company could achieve significant savings by providing higher incentives to customers with electric resistance heating, such as baseboard heating, to adopt a mini-split heat pump or central heat pump system." (OCA St. 1, p. 19.) Do you agree with this statement?

A. Perhaps when it comes to net energy savings when looking exclusively at electric options that may be accurate. However, if the goal of the Plan is to reduce electric usage, then removing the heating load from the electric system entirely would provide even more savings towards that goal. It is also a larger administrative burden to verify that a customer's baseline conditions are electric resistance heating, compared to providing a rebate for the type of energy efficiency equipment.

D. <u>Weatherization Measures</u>

Q. Why does Ms. Sherwood recommend that the Company include additional weatherization measures in its Plan (OCA St. 1, p. 13)?

A. Ms. Sherwood states that the Company's residential programs "do not offer any comprehensive measures to allow for whole home efficiency, like weatherization." (OCA St. 1, p. 13.) She also argues that the Plan's "limited measure offerings do not provide a comprehensive suite of programs for residential customers" like most other utility EE&C programs, "such as in-home audits, air sealing, and attic insulation." (OCA St. 1, p. 13.)

Q. In developing the Phase IV EE&C Plan, did UGI Electric consider including weatherization measures, such as home audits, air sealing, and attic insulation?

A. Weatherization measures were not considered a priority in the planning process because past experience with these measures indicated that they were not cost-effective for a small, electric-only program administrator with limited weatherization contractors in UGI Electric's service territory.

Q. Ms. Sherwood acknowledges that "[c]omprehensive measures [like weatherization] tend to be costly and more time-consuming than rebating an appliance." (OCA St. 1, p. 13.) Has Ms. Sherwood provided any analysis on the potential impacts of incorporating further weatherization measures into the Plan?

A. No, Ms. Sherwood did not provide any analysis on the potential impact of incorporating weatherization measures into UGI Electric's Plan. Further, it does not appear that she has undertaken such an analysis. See response to UGI to OCA-I-1 (UGI Electric Exh. TML-3R).

Q. On page 20 of her direct testimony, Ms. Sherwood claims that the UGI Electric website "fails to inform its customers of the benefits of weatherization or suggest that it should be completed prior to the adoption of new HVAC equipment." Does UGI Electric currently include information for customers regarding weatherization measures?

A. The Company does not currently include information for customers regarding weatherization measures on its rebate application. Given that the Company does not provide rebates for weatherization measures, providing this information could lead to customer confusion.

Q. Ms. Sherwood recommends that the Plan should include weatherization measures or, alternatively, the Company should educate its customers on the importance of weatherization related to the installation of HVAC equipment. (OCA St. 1, p. 20.) Do you agree with this recommendation?

A. In part. I recommend that the website that would be developed for the Energy Kits Program include information about the benefits of weatherization and could point customers to additional resources for doing weatherization projects, such as the IRA and other Pennsylvania-based programs.

However, I find Ms. Sherwood's recommendation to provide this education to customers at odds with her recommendation to move away from the Energy Kits Programs. The savings provided by the Energy Kits Programs help "pay" for the education component from a cost-effectiveness perspective. The energy kits then provide a tangible link back to the recommendations provided in educational

settings, such as the classroom or a website, that will create more lasting impressions with customers.

Q. Ms. Sherwood further recommends that the Company promote the use of IRA rebates to address weatherization efforts. (OCA St. 1, p. 20.) Do you agree with this recommendation?

A. In part. I agree that the Company should be aware of and look for ways to make customers aware of IRA rebates. However, any further detailed approach should not be addressed as part of this proceeding because Pennsylvania is still finalizing its plan at this time. It is my understanding that the Company does plan to provide a link on its website to information about available tax credits.

Q. Ms. Sherwood also recommends that the Company "[p]rovide contractor training on the importance of properly sizing equipment and promoting weatherization to occur prior to the installation of HVAC equipment" and "[e]ncourage contractors to convey this information to participants as part of the sales pitch for the HVAC equipment." (OCA St. 1, pp. 5, 27.) Do you agree with this recommendation?

A. I agree that contractor training on the proper sizing of HVAC equipment is valuable, but I find her recommendation to be improper for inclusion in the Phase IV Plan at this time. I do not believe that contractors who are trying to sell HVAC equipment will find instructing customers to first weatherize their homes before purchasing their product to be beneficial to their business. It is my opinion that

training of this nature should be directed at a separate audience, such as directly to customers or vendors that could perform both weatherization and HVAC installation services. In her response to UGI to OCA-I-23 (UGI Electric Exh. TML-9R), Ms. Sherwood does not provide any specific details of how this training should be facilitated.

Q. Ms. Sherwood further recommends that the Company "[c]onsider providing an incentive to contractors when they ensure that weatherization occurs prior to the installation of the rebated HVAC equipment." (OCA St. 1, pp. 5, 27.) Do you agree with this recommendation?

A. No, not in the context of UGI Electric's programs. There may be some leeway for larger program implementors with a broader contractor, geographical, and customer base to provide more comprehensive weatherization training and incentive structures. The challenge for a small service territory, like UGI Electric's, is that there are few contractors providing service in the territory. For some of these contractors, UGI Electric's territory represents a small portion of the territory that they service. Those few contractors would likely not want the administrative burden of ensuring weatherization has occurred before installing rebated HVAC equipment for only a small portion of their customer base. From a program administration perspective, the additional administrative costs to verify that the weatherization has occurred puts additional pressure on cost-effectiveness.[9]

[9] I am only aware of one contractor that would be able to provide both weatherization and HVAC services in UGI Electric's service territory. UGI Electric's service territory would also represent only a small portion of its total service area.

Q. Does Ms. Sherwood provide any analysis related to the costs of and resultant savings from her recommendations for training and/or incentivizing HVAC contractors?

A. No. Ms. Sherwood has not performed any analysis on the impacts of this recommendation. Further, she acknowledges that this is not her area of expertise.[10]

E. Appliance Rebate Program

Q. Please summarize Ms. Sherwood's concerns related to the Appliance Rebate Program.

A. On page 17 of her direct testimony, Ms. Sherwood states that she is concerned that: (1) participation forecasts are higher than achieved in prior phases for continued measures; (2) there may be a higher uptick on HVAC appliances with the emphasis from the IRA; (3) fuel switching measures should not be a part of the program; and (4) a lack of weatherization measures could result in the oversizing of HVAC equipment installations.

Q. Do you agree with Ms. Sherwood's concerns regarding participation in the Appliance Rebate Program?

A. No. Please see my response in Section III.A on how projection assumptions for the Appliance Rebate Program were developed and represent a reasonable estimate of future participation levels.

[10] *See* response to UGI to OCA-I-23 (UGI Electric Exh. TML-9R).

Q. On page 20 of her direct testimony, Ms. Sherwood recommends that the Company runs a sensitivity analysis "to determine how historical levels of participation and increasing interest in electrification measures may impact the [Appliance Rebate Program's] costs and cost-effectiveness." Do you agree with this recommendation?

A. No. Ms. Sherwood provided additional clarification on her request for a sensitivity analysis in her response to UGI to OCA-I-15 (UGI Electric Exh. TML-10R), which leads me to conclude that the requested analysis is unnecessary. First, the Company already examined different projected levels of participation while it was developing its Plan projections. Second, the Plan is meant to provide a reasonable target level of savings and spending, not to provide a range of options for stakeholders to pick from. Third, there is no clear benefit from delaying proceedings to perform an additional analysis that may not provide differing participation projections. As explained previously in this testimony, the projections for the Appliance Rebate Program are reasonable based on current market conditions and recent program experience, and despite Ms. Sherwood's allegations to the contrary, are rooted in historical trends and already adequately consider future impacts from the IRA.

Q. On pages 15 to 16 of her direct testimony, Ms. Sherwood recommends that in order to take advantage of IRA incentives, the Company should (1) identify which measures meet the IRA eligibility requirements and evaluate whether it should make any changes based on the evaluation to meet IRA efficiency

requirements; and (2) partner with an EDC for processing and documentation related to IRA program participation to lower the administrative burden of recovering IRA rebates. Do you agree with these recommendations?

A. No. The Company has already identified which measures meet IRA eligibility requirements. All heat pump and heat pump water heater measures currently meet eligibility requirements for the IRA. However, the Company cannot make any further commitments relating to the IRA at this time because it is unknown if EDCs will play any part in recovering IRA rebates, or what the processing and documentation requirements for EDCs will be to recover IRA rebates. This information will not be known until the Pennsylvania Department of Environmental Protection files its final application plan and receives approval from the United States Department of Energy. Committing to this recommendation at this time would be premature.

Q. Please respond to Ms. Sherwood's recommendation that fuel switching measures should not be part of the Appliance Rebate Program.

A. Please see my discussion of this issue in Section III.C of this rebuttal testimony addressing the basis for including fuel switching measures as part of EE&C Plans under Act 129.

Q. Please respond to Ms. Sherwood's claim that a lack of weatherization measures could result in the oversizing of HVAC equipment installations undertaken as part of the Appliance Rebate Program.

A. To my knowledge, this type of requirement is not present in any other EE&C program offered in Pennsylvania.

F. Low-Income Program

Q. What concerns does Ms. Sherwood raise regarding the Low-Income Program?

A. She is concerned that: (1) heat pump waters do not fit all homes; and (2) smart thermostats require a Wi-Fi connection, which "cannot be guaranteed."

Q. Do you share Ms. Sherwood's concerns regarding the Low-Income Program?

A. No. While heat pump water heaters are not appropriate for all home settings, the CBO implementing the program is given a long list of eligible customers, and then works to find homes that are appropriate targets for a HPWH.

Regarding the smart thermostat program, Wi-Fi is never guaranteed, but 2019 data from United States Department of Health and Human Services finds that 62% of customers at or below 100% of the federal poverty level have access to broadband internet in Pennsylvania.[11] Given that UGI Electric only plans to install 10 thermostats per program year, it is unlikely that a lack of Wi-Fi would prohibit the Company from successfully meeting its objectives.

[11] Report available at https://aspe.hhs.gov/reports/low-income-internet-access.

Q. On pages 24 to 25 of her direct testimony, Ms. Sherwood argues that "low-income customers are paying into the program but have limited opportunities to participate" because of participation levels and measure offerings. Do you agree?

A. No. The Energy Kits Program and the School Energy Program are two programs that customers can participate in at no cost, and they have some of the broadest participation projections in the entire Plan. If Ms. Sherwood is concerned about having a variety of options for low-income customers to participate in, then she should approve of the inclusion of the Energy Kits and School Energy Programs.

Q. What recommendations does Ms. Sherwood make regarding the Low-Income Program?

A. Ms. Sherwood recommends that: (1) the Company should have explored other measures for the Low-Income Program; and (2) the program eligibility be re-evaluated to potentially include offerings to non-LIURP customers who are also income-qualified and that would not be dependent on customer's usage (particularly a high-usage threshold).

Q. Do you agree with Ms. Sherwood's recommendations?

A. No. The Company did not consider offering other measures for low-income customers as part of its EE&C Plan, as the Company believes it has sufficient funding within its Universal Services and Energy Conservation Programs to assist low-income customers.

Q. How does the Company plan to achieve the forecasted participation in the Low-Income Program?

A. As discussed in Section III.A of my rebuttal testimony, the Program achieved its participation targets for HPWH in PY11 and plans to continue doing so. The Company will continue working with the two CBOs in its service territory by providing them with a list of customer prospects who are confirmed low income, but not eligible for LIURP. The CBO strategies may include, but will not be limited to, email, direct mail, phone calls, as well as community outreach and events in order to increase awareness of program availability.

G. Evaluation, Measurement, and Verification Process

Q. Ms. Sherwood recommends that the Plan undergo a full EM&V process once per EE&C Plan term in addition to filing annual program year results. (OCA St. 1, p. 12.) Do you agree?

A. Yes. As described on page 30 of the proposed EE&C Plan (UGI Electric Exh. 1), the Company plans to evaluate the Residential Programs in PY14 and nonresidential programs in PY15 and has included a budget of $270,000 in the "Evaluation" line item for portfolio wide costs to do so.

Q. Ms. Sherwood further states that the Company's annual program year results do not discuss "the verification of measure installs and in-service rates for the UGI service territory." (OCA St. 1, p. 12.) Please respond.

A. The Company utilizes the same TRM calculations as the statewide Act 129 TRM which undergoes rigorous EM&V each year. As discussed above, UGI Electric plans to perform an evaluation on each of its programs as part of the Phase IV Plan. The Company incorporates any adjustments made as a result of these EM&V findings to ensure accuracy of savings.

Q. Ms. Sherwood also maintains that the Company "should file any evaluations performed on a program and include as part of its plan the description of the evaluation if that evaluation will be utilized in lieu of the TRM." (OCA St. 1, p. 8.) Please respond.

A. UGI Electric does not believe that this requirement is necessary, as parties can adequately access the evaluations through the discovery process during the Phase V EE&C proceeding.

Q. Does this conclude your rebuttal testimony?

A. Yes, it does. I reserve the right to submit supplemental testimony during the course of the proceeding. Thank you.

UGI Electric Exhibit TML-1R

3.3 Residential Low-Income Program

(Low-Income Customers)

Program Objectives:
The objectives of the Residential Low-Income Program included:

1. Providing UGI Electric's confirmed low-income customers with an array of no-cost energy-saving equipment and/or education to help reduce their energy costs, such as the direct installation of HPWHs, ENERGY STAR smart thermostats, and additional and/or different measures than those offered through the Company's Low-Income Usage Reduction Program ("LIURP");
2. Achieving high customer satisfaction through impactful program offerings; and
3. Achieving a total reduction in energy use of 124 MWh over the life of the Phase III EE&C Plan.

Program Description:
Through the Residential Low-Income Program, UGI Electric offers a direct installation, at no cost to the participant, of an ENERGY STAR HPWH, smart thermostats, and additional and/or different measures than those offered through the Company's LIURP to eligible low-income customer residents.

Program Review:
The Residential Low-Income Program launched on June 1, 2020. The UGI Electric EE&C team partnered with CBOs Agency for Community EmPOWERment (ACE) of Northeastern PA (NEPA) and the Commission on Economic Opportunity (CEO) to identify eligible participants and perform customer installations. The program completed ten HPWHs and one smart thermostat installation. The program was cost-effective, as the TRC BCR was 1.22 and net benefits were $5,190. See Tables 17-19 below.

Table 17. Program Participation:

Total Measures		
Measure	**PY11 Actual**	**PY11 Budget**
ENERGY STAR Smart Thermostat	~~1~~01	9
Heat Pump Water Heater	~~1~~10	9
Total	**11**	**18**

UGI Electric Exhibit TML-2R

UGI Utilities, Inc. – Electric Division
Phase IV of its Energy Efficiency and Conservation Plan
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UGI TO OCA – SET I

OCA-I-9

Please reference OCA Statement 1, p. 18. Please explain in detail whether Ms. Sherwood is concerned that UGI Electric will exceed its projected participation levels or will not reach its projected participation levels.

Response:

Ms. Sherwood is concerned that for a majority of the measures, the Company will not meet the Company's projected levels, particularly given the historically low participation levels. One exception may be the rebates for heat pump technology if the technology aligns with eligible measures for IRA. However, at this time it is unclear how the IRA will drive program participation as the program has not been fully designed and 2023 results are not available. If the IRA does drive participation for heat pump measures, the Company may experience higher levels than the limited projections provided in the Phase IV plan.

UGI Electric Exhibit TML-3R

UGI Utilities, Inc. – Electric Division
Phase IV of its Energy Efficiency and Conservation Plan
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UGI TO OCA – SET I

OCA-I-1

Please reference OCA Statement 1. For each recommendation made in OCA Statement 1:

(a) Please explain whether Ms. Sherwood has studied or evaluated her recommendation's impact on:

(i) The individual programs' cost-effectiveness;

(ii) The overall portfolio's cost-effectiveness;

(iii) The savings for all customer sectors and programs; and

(iv) The costs for all sectors and programs.

(v) If so, please provide those studies or evaluations, including all documents, reports, and workpapers that Ms. Sherwood relied upon in performing those studies or evaluations, in their native format (e.g., Microsoft Excel).

(b) Please identify where the dollars in the budget for the proposed Phase IV EE&C Plan will come from to implement this recommendation.

(c) If the recommendation is the addition of a new measure or program, please provide its projected budget, participation level, and savings for each Program Year of Phase IV.

(d) If the recommendation is the addition of a new measure or program, please provide its TRC benefit-cost ratio.

(e) Please provide all documents, reports, and workpapers relied upon by Ms. Sherwood in providing the information requested in subparts (c) and (d) above.

Response:

(a) Ms. Sherwood did not perform a cost-effectiveness analysis of either individual programs, or the overall portfolio, nor has Ms. Sherwood studied or evaluated the savings and costs for all program and sectors. Ms. Sherwood has not been retained to design the Company's energy efficiency portfolio. She has made recommendations based on best practices and successful measure and program implementations in other jurisdictions.

(b) Please see response to 1a.

(c) Please see response to 1a.

(d) Ms. Sherwood does not have any documents, reports, or workpapers to provide responses to the above subparts.

UGI Electric Exhibit TML-4R

UGI Utilities, Inc. – Electric Division
Phase IV of its Energy Efficiency and Conservation Plan
Docket No. M-2023-3043230
UGI TO OCA – SET I

OCA-I-3

Please reference OCA Statement 1, p. 11.

(a) Has Ms. Sherwood evaluated whether changes to in-service rates could positively affect the cost-effectiveness of the proposed Phase IV EE&C Plan?

(b) If Ms. Sherwood has performed the evaluation described in subpart (a), please explain in detail how changes to in-service rates could positively affect the cost-effectiveness of the proposed Phase IV EE&C Plan and provide all supporting documents used to perform the evaluation.

(c) Please explain in detail whether Ms. Sherwood believes that the Inflation Reduction Act ("IRA") will increase program participation and provide all documents relied upon by Ms. Sherwood to reach that conclusion.

(d) Please provide any analysis performed by Ms. Sherwood on the effect of the IRA on energy efficiency program participation.

(e) Please explain in detail Ms. Sherwood's understanding of how IRA tax credits and rebates should be treated under the Act 129 TRC Test.

(f) Please provide any analysis performed by Ms. Sherwood that demonstrates how the Company's projected participation, spending, and in-service rates "could negatively impact the Plan enough to render it not cost-effective."

Response:

(a) Ms. Sherwood did not conduct a specific analysis of the in-service rates in this case. However, if in-service rates were to increase, it would likely have a positive impact on the cost-effectiveness. This would occur due to an increase in the adoption rate increasing the level of savings recognized which can offset the cost to deliver the program that are accounted for as part of the cost-effectiveness test.

(b) See response to part a.

(c) The IRA will likely drive participation for the measures rebated under IRA; it is unclear what level that will have on utility programs. With that said, the IRA serves as an additional marketing source for energy efficiency and electrification measures which will likely translate to contractors who implement those measures to share additional rebate and monetary savings opportunities with its customers to increase sales and encourages IRA rebate participants to seek additional funding for their projects.

(d) It is unclear whether the reference is to IRA tax credits or rebates. Evaluations on the impact of both IRA opportunities have not been completed yet as 2023 is the first year for the tax credits and the IRA rebates have not yet been rolled out. Therefore, the impact of these opportunities on energy efficiency programs is unclear.

(e) According to the PA PUC Order on the 2021 Total Resource Cost Test, the IRA tax credits and rebates are considered as outside incentives and therefore are treated as a reduction in the incremental cost for the EDCs Act 129 Phase IV plans if they are reasonably quantifiable. It is unclear at this time whether the Commission will issue guidance related specifically to the IRA tax credits and rebates for Phase V plans, as these offerings were not known at the time of the Phase IV Order. While this is the current methodology for treatment of outside incentives, it is unclear what would be considered reasonably quantifiable at the time of project/measure being recorded, as the person claiming the IRA tax credit would need a tax liability to credit against and its unknown if the tax credit will be transferred to another party. For the IRA rebates, most are based upon income qualification, and it may be difficult to reasonably estimate which moderate income customers are utilizing the IRA rebates unless the utility is one of the processors; however, it is unclear at this time how Pennsylvania will implement IRA rebates.

(f) Ms. Sherwood did not perform specific analysis related to this plan. There are several scenarios that could negatively impact the cost-effectiveness of the plan. Some examples include low levels of participation resulting in decreased recognized savings, high fixed program costs, decreased in-service rates and realization rates, inflation, and unexpected changes to deployment of a program.

UGI Electric Exhibit TML-5R

UGI Utilities, Inc. – Electric Division
Phase IV of its Energy Efficiency and Conservation Plan
Docket No. M-2023-3043230
UGI TO OCA – SET I

OCA-I-18

Please reference OCA Statement 1, pp. 23-24.

(e) At what precise percentage of "residential energy savings" would the proposed Phase IV EE&C Plan no longer be "heavily reliant on energy efficiency kits"? Please provide all documents relied upon by Ms. Sherwood in reaching that conclusion and in responding to this interrogatory.

(f) Is it Ms. Sherwood's position that EE&C program administrators should be permitted to realize benefits beyond 15 years?

Response:

(a) Ms. Sherwood does not have a precise percentage to meet this statement, as that assessment would require consideration of the overall measure mix and program offerings.

(b) This question is unclear as to what the 15 years is in reference to. Recognition of benefits should be limited to the measure life assumption.

UGI Electric Exhibit TML-6R

7

SCHOOL ENERGY EDUCATION

Process Evaluation Results

This section presents the results of AEG's process evaluation for the School Energy Education Program.

Home Energy Worksheet Survey

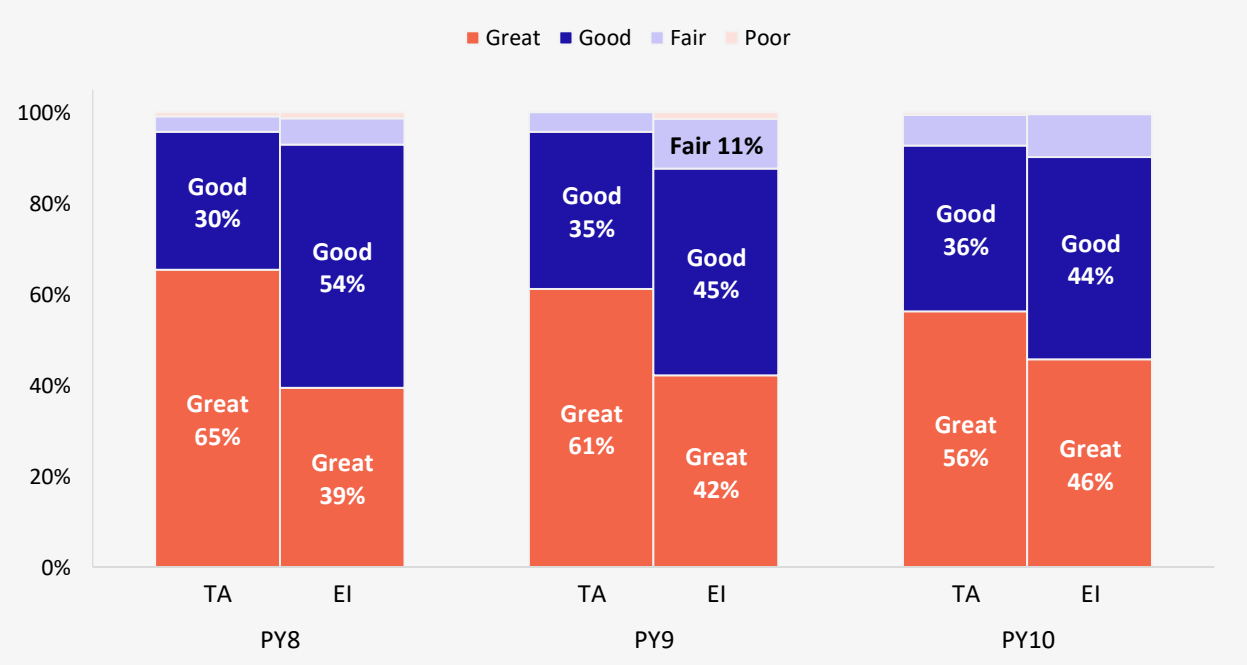
Students participating in the program receive a take home energy efficiency kit and complete and return home energy worksheets (HEWs), or surveys that the implementer designs to assess such things as each measure's ISR and how students and parents rate the program. The next sections show the process results of the HEWs.

In the figures below, we group the kits together by year and present the results. The Take Action (TA) and Energy Innovation (EI) kits contain slightly different measures[26] and are given to students in different grades. We do not perform statistical tests to compare the kits but only present the broader trends across PY8-PY10.

Program Ratings

Figure 7-1 shows participating students' and parents' ratings of UGI's School Energy Education Program by kit and by year. In general, the sum of *great* and *good* ratings each year and for each kit is quite high—generally above 90%—except for Energy Innovation PY9 where the sum of *great* and *good* was 88%.[27]

Figure 7-1 School Energy Education—Ratings of Program by Kit and by Year (Responses of less than 10% are not shown; may not match due to rounding)



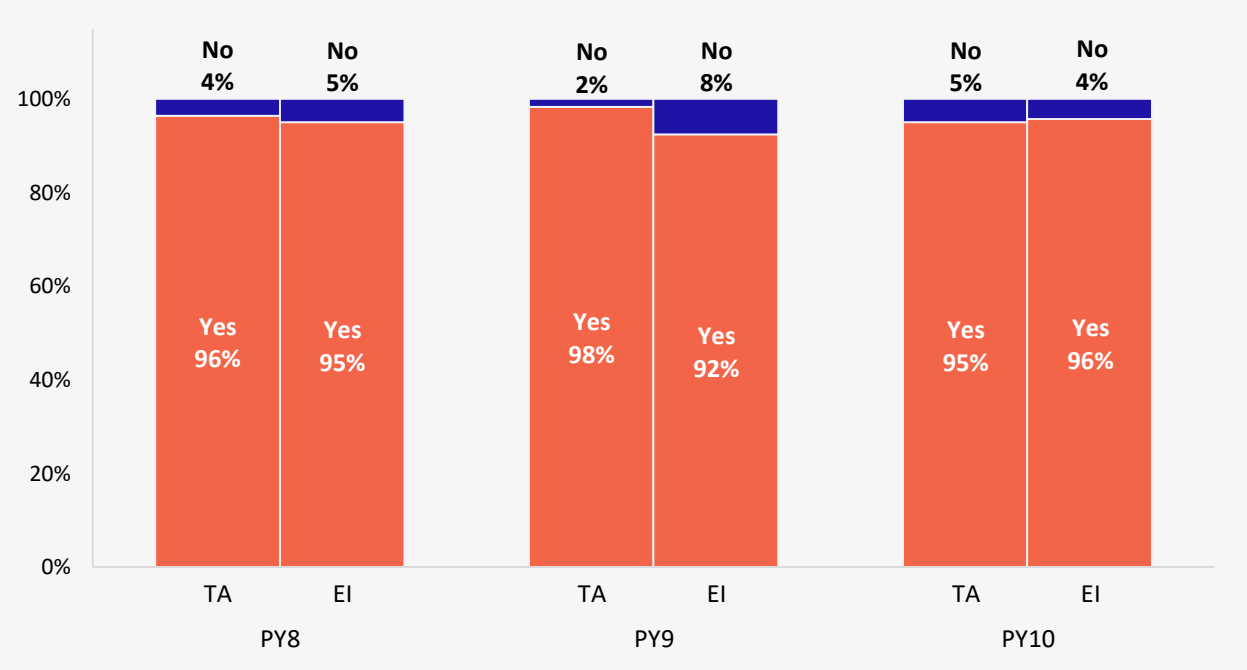
[26] Depending on the year, Energy Innovation kits contain tier 2 smart strips, more LED bulbs, and extra aerators. See Table 7-3 and Table 7-4 for the full measure list of each kit in each year.

[27] Result does not match reported values in Figure 7-1 due to rounding.

AEG did not find statistically significant differences in *good* and *great* ratings between the same kits in all iterations of program years.[28] The surveys did not have explanations for any variances in satisfaction between years, but, statistically, we can consider the variation noise.

Across both kits and all years, students and parents overwhelming want to see the program continue, as shown in Figure 7-2.

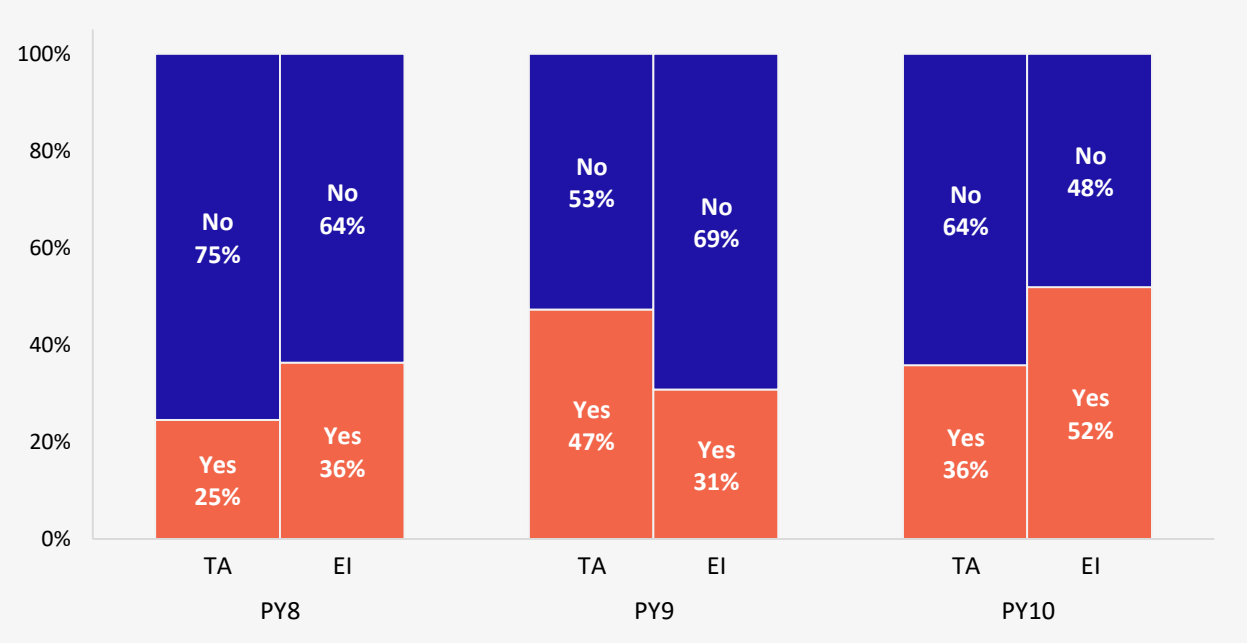
Figure 7-2 School Energy Education—Would you Like to See this Program Continue in Local Schools?



One consistent finding across kits and years was that students and parents generally have not visited UGI's website to learn more about other energy efficiency programs. However, 52% of Energy Innovation Respondents in PY10 said they had, as shown in Figure 7-3.

[28] AEG used a pooled-proportion z-test at the 90% confidence level testing TA PY8 vs TA PY9, TA PY9 vs TA PY10, and TA PY8 vs TA PY10. Likewise for the Energy Innovation kits. In all tests, none were found to be different. We did not test the two different kits against each other because they are different kits given to different populations.

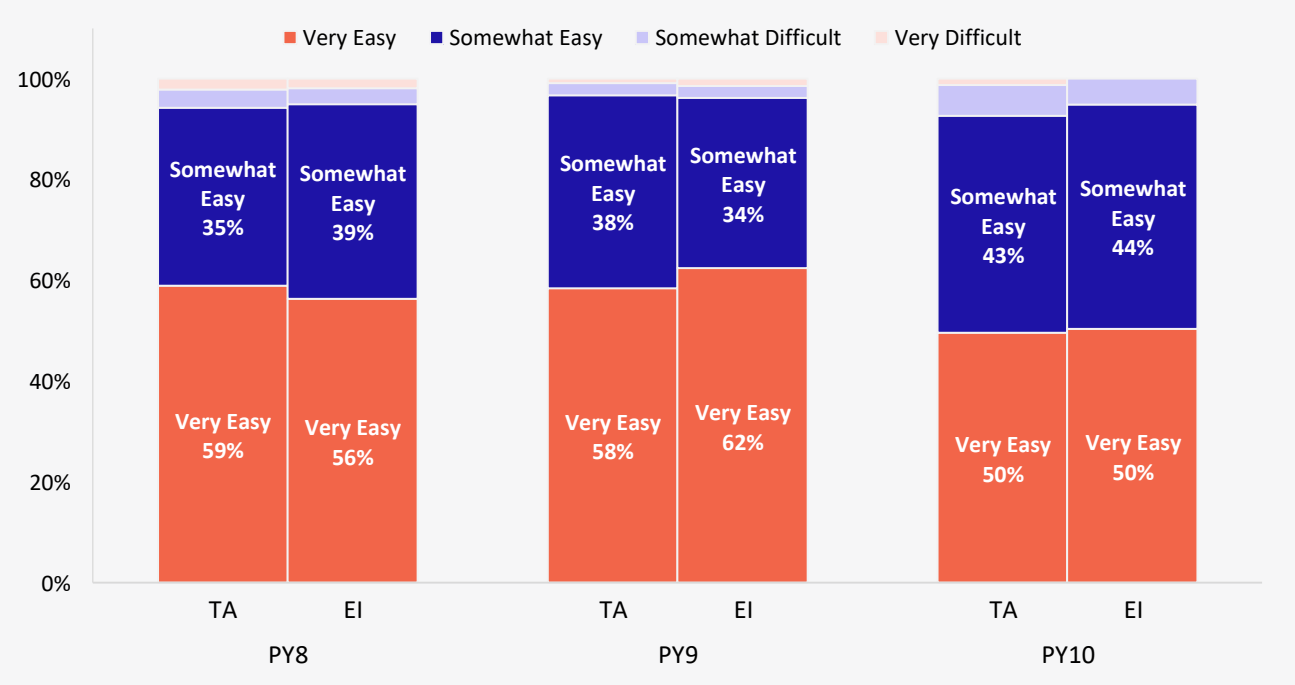
Figure 7-3 School Energy Education—Have You Visited UGI's Website to Learn About Other Energy Efficiency Programs?



Kit Details

Figure 7-4 shows that students and parents, across all years, generally found it *very easy* or *somewhat easy* to install the items in the kit—with the sum of *very easy* and *somewhat easy* being over 90% in all years.

Figure 7-4 School Energy Education—How Easy to Install Kit Items (Responses of less than 10% not shown)



Respondents also generally stated that the program changed the way that they use energy in their home, as shown in Figure 3-5. In all years except Take Action in PY10, 70% or more of respondents said that the program changed the way they use energy in their home.

Figure 7-5 School Energy Education—Has Program Changed Way You Use Energy in Your Home?

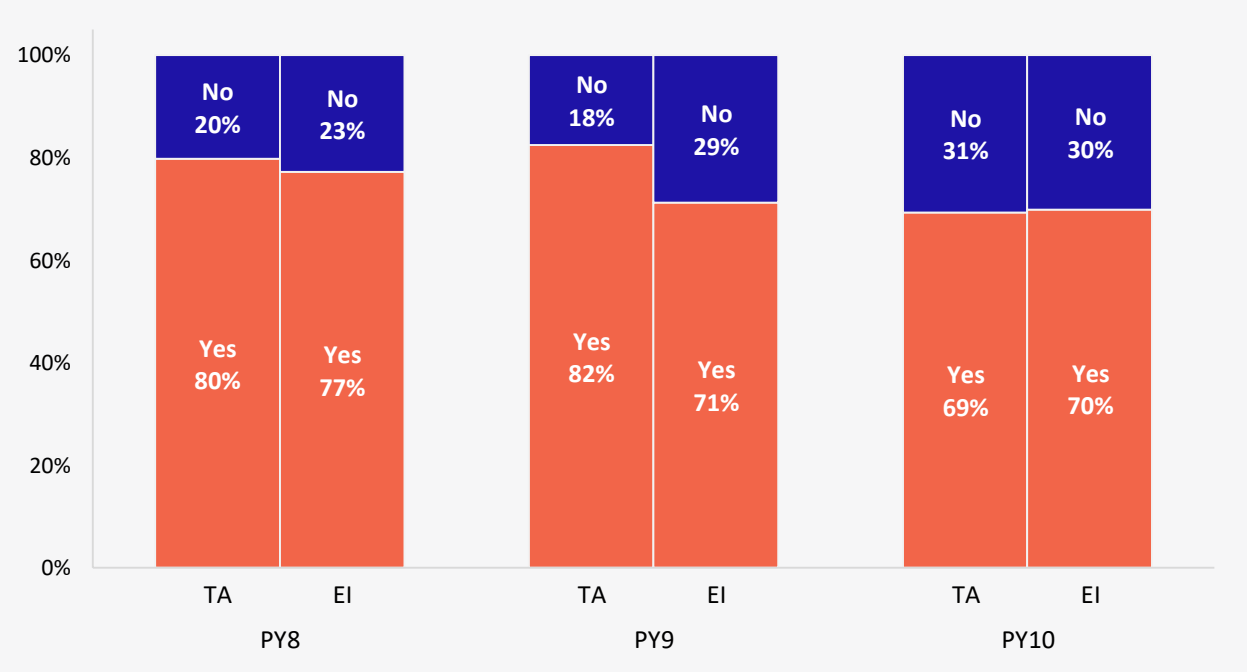
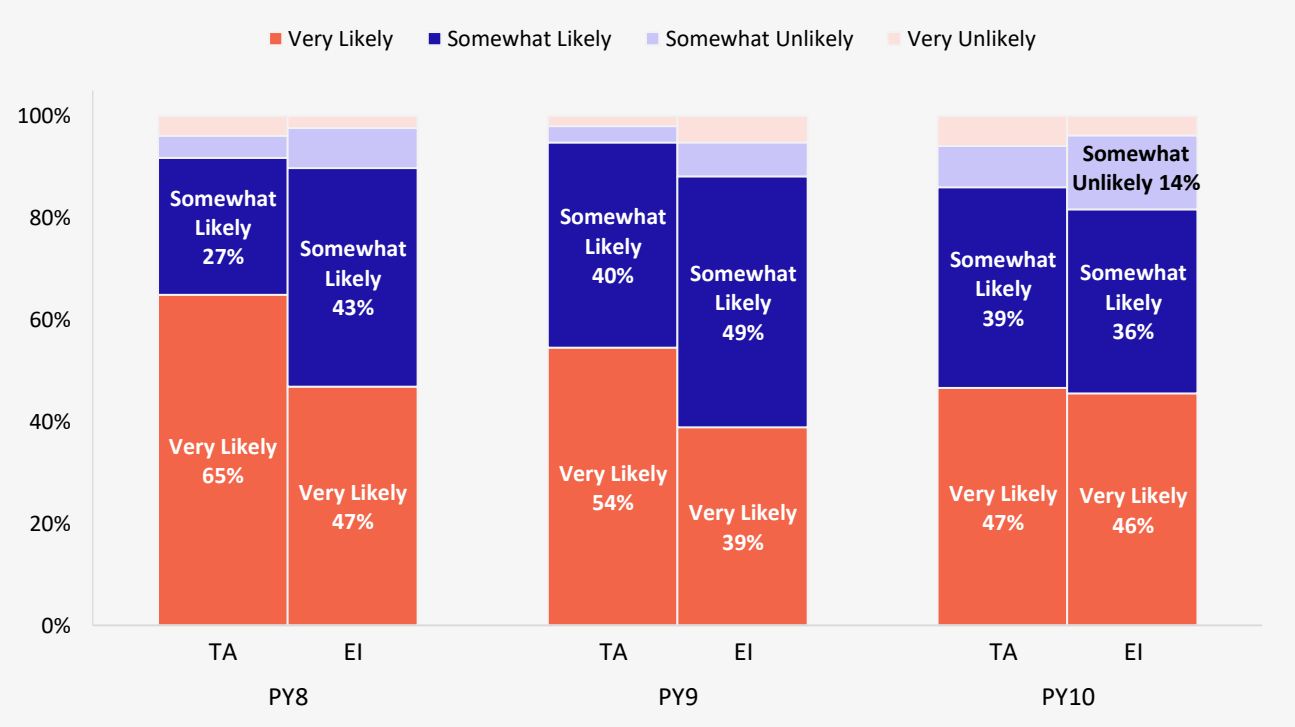


Figure 7-6 shows respondents' likelihood to continue using the kits' measures after the program. Respondents' likelihood to continue using the measures dropped slightly in PY10—with Energy Innovation PY10 respondents having the lowest overall sum of *very likely* and *somewhat likely*: 82%. Though, the likelihood to continue using the kit measures is quite high and, overall, responses of *very unlikely* were quite low (around 5% or lower in all years).

Figure 7-6 School Energy Education—Likelihood to Continue Using Kit Measures (Responses less than 10% not shown)



Implementer Interview

NEF is the program implementer. AEG spoke with representatives from NEF to talk about NEF's communications with UGI, program operations, and the strengths and challenges of the program.

Both NEF and UGI were satisfied with their level of communication with each other. Communication occurs throughout the year and increases when the program is active in May and in the fall of each year. NEF works with many of the same schools each year, and one challenge they listed was that the service territory is quite small. Likewise, not every school can participate every year—so as not to oversaturate parents with multiple children.

NEF has stated teacher satisfaction is high. Teachers generally appreciate having lesson plans covered for them, and they like hands-on activities. NEF asks for teacher feedback, and NEF stated that they have received no *fair* or *poor* responses from teachers.

Impact Evaluation Results

This section presents the results of the impact evaluation of the School Energy Education Program in PY8-PY10. These results include the results from our savings replication and engineering analysis.

Total Program Savings

In this section, we show the total program savings by year and by kit. In the next section, we discuss the summary of differences between claimed and adjusted savings. Appendix D has the details by measure and by kit.

Table 7-1 shows the total evaluation claimed, replicated, and adjusted electric kWh savings by year and kit and Table 7-2 shows the total peak demand savings by year and kit. AEG found the overall energy realization rate

across PY8-PY10 to be 93% with total adjusted energy savings of 1,410,086 kWh and the overall peak demand realization across to be 100% with total adjusted peak demand savings of 149.78 kW.

Table 7-1 School Energy Education—PY8-PY10 Electric Energy Savings by Year and by Kit

Year	Kit	Kits Delivered	Claimed kWh	Replicated kWh	Adjusted kWh	Realization Rate (Adjusted/ Claimed)
PY8	Take Action	1,076	336,281	337,327	298,578	89%
	Energy Innovation	454	280,202	275,854	246,660	88%
PY9	Take Action	836	214,661	208,599	185,192	86%
	Energy Innovation	450	236,139	231,525	219,860	93%
PY10	Take Action	1,072	281,703	281,715	287,537	102%
	Energy Innovation	484	171,025	171,030	172,259	101%
Total		**4,372**	**1,520,011**	**1,506,051**	**1,410,086**	**93%**

Table 7-2 School Energy Education—PY8-PY10 Peak Demand Savings by Year and by Kit

Year	Kit	Kits Delivered	Claimed kW	Replicated kW	Adjusted kW	Realization Rate (Adjusted/ Claimed)
PY8	Take Action	1,076	35.03	35.74	31.43	90%
	Energy Innovation	454	29.49	29.43	26.04	88%
PY9	Take Action	836	16.37	22.59	19.98	122%
	Energy Innovation	450	22.15	24.16	22.74	103%
PY10	Take Action	1,072	28.60	30.06	30.86	108%
	Energy Innovation	484	18.40	18.61	18.73	102%
Total		**4,372**	**150.04**	**160.59**	**149.78**	**100%**

Overall, there were several small differences between the claimed and adjusted savings that we summarize in the next section and detail in Appendix D. However, the largest driver for the difference between claimed and adjusted savings is that the ISR for LED bulbs was calculated incorrectly.

According to the Uniform Methods Project[29] (UMP), the ISR for LED bulbs should be projected over a three-year period. Some proportion of uninstalled bulbs will get installed each year for three years. The claimed savings' ISR assumed that all LED bulbs that were marked as "will be installed" will get installed. This overstates LED bulb savings—especially in a kit program where participants are given bulbs and not purchasing them. Overall, AEG followed the UMP which decreased the ISR of LED bulbs and decreased the overall savings.

Table 7-3 shows the contents of the Take Action Kits in each year, and Table 7-4 shows the contents of the Energy Innovation Kits each year. The next section summarizes the differences between claimed and adjusted savings by measure.

[29] Dimetrosky, S.; Parkinson, K.; Lieb, N. (2017). *Chapter 6: Residential Lighting Evaluation Protocol, The Uniform Methods Project: Methods for Determining Energy-Efficiency Savings for Specific Measures*. Golden, CO; National Renewable Energy Laboratory. NREL/SR-7A40-68562. http://www.nrel.gov/docs/fy17osti/68562.pdf

Table 7-3 School Energy Education—Take Action Kit Contents by Year

Measure	PY8	PY9-PY10
Low flow showerhead	1	1
Low flow kitchen aerator	1	1
Low flow bathroom aerator		1
9W LED	3	
11W BR30		2
Water heater setback	1	1

Table 7-4 School Energy Education—Energy Innovation Kit Contents by Year

Measure	PY8	PY9-PY10
Low flow showerhead	1	1
Low flow kitchen aerator	1	1
Low flow bathroom aerator	1	1
9W LED	3	
11W BR30	2	2
Tier 2 Smart Strip	1	1
Water heater setback	1	1

Reasons for Differences between Claimed and Adjusted Savings

Summary

Table 7-5 shows the summary of all the differences between the claimed and adjusted savings. Appendix D goes into detail—year-by-year, kit-by-kit, and measure-by-measure—but this represents all the changes that AEG found. The two most meaningful differences were AEG calculating LED bulbs' ISRs by using the methodology in the UMP (decrease) and AEG correcting LED baseline bulb calculations in PY10 (increase). All other changes had minor effects on the program's savings.

Red arrows pointing down (↓) indicate a decrease in savings, green arrows pointing up (↑) indicate an increase in savings, and arrow pointing left and right (↔) indicate that the savings increased or decreased depending on the specific measure, but, overall, the effect was mostly neutral.

Table 7-5 School Energy Education—PY8-PY10 Summary of All Differences between Claimed and Adjusted Savings

Year	Kit	LED ISR Methodology Different	LED Baseline Bulb Calculation Different	ISR Slightly Different	WH Fuel Saturation Slightly Different	People per Home Slightly Different	Tier 2 Smart Strip Survey Results Different	Corrected TRM Inputs
PY8	Take Action	↓		↔		↔		↔
	Energy Innovation	↓		↔		↔		↔
PY9	Take Action	↓		↔	↑			↔
	Energy Innovation	↓		↔				↔
PY10	Take Action	↓	↑	↔	↑	↔		↔
	Energy Innovation	↓	↑	↔	↑	↔	↓	↔

In summary, each of the differences are due to the following:

- AEG followed the UMP's methodology for calculating LED bulbs' ISRs—see Table D-14, Table D-15, and Table D-17; this decreased the savings and was the driving factor in the difference in claimed and adjusted savings
- AEG corrected the LED baseline bulb calculations in PY10—see Table D-20 and Table D-21; this increased the savings
- AEG's survey analysis found slightly different results in the—see Survey Inputs Comparison—
    - ISRs (increased and decreased depending on the measure)
    - Electric water heater fuel saturations (slight increase)
    - People per home (increased and decreased depending on the measure)
    - Tier 2 smart strip locations (slight decrease)
- AEG corrected the TRM inputs of—see Per-Unit Savings Comparison—
    - Distribution of electric water heater types (slight decrease)
    - Low flow bathroom faucet aerators (decrease)
    - Low flow showerheads (large increase but only for peak demand savings)
    - LED bulbs (slight increase)
    - Tier 2 smart strips (slight increase)

School Energy Education

Impact Evaluation

The impact evaluation found that the program has met 163% of its savings goal and that the realization rate is 93%.

Table 9-5 School Energy Education—PY8-PY10 Impact Evaluation Results

Program	PY8-PY10 kWh Savings Goal	PY8-PY10 Claimed kWh Savings	Kits Distributed	Adjusted kWh Savings	Adjusted Savings as % of Savings Goal	Realization Rate
School Energy Education	864,000	1,520,011	4,372	1,410,086	163%	93%

Process Evaluation

The process evaluation found the following strengths and challenges for the program.

Program Strengths

- Parents, students, and teacher satisfaction with the program is very high.
- Parents and students rated the kit measures as easy to install.
- The program has consistently changed the way parents and students use energy in their home.
- Parents and students overwhelmingly would like to see the program continue.
- The program has already exceeded its Phase III savings goals.

Program Challenges

- Parents and students have generally not visited UGI's website to learn about other energy efficiency programs after participating in the School Energy Education Program.
- Parents' and students' likelihood to continue using the kit items post-completion of the program dropped in PY10. It remains quite high, overall, but that should be monitored in future program years.

School Energy Education Recommendations

AEG recommends the following actions to improve the Appliance Rebate program:

Recommendation 1: UGI and NEF should continue to deliver the School Energy Education at a high level.

The program is operating exceedingly well. UGI and NEF deserve credit for their excellent delivery, and overall, they should continue to do what they are doing.

Recommendation 2: To increase the accuracy in claimed savings, follow the UMP's guidance for forecasting LED bulbs' ISR.

Currently, LED bulbs' claimed ISR is being overstated. While LED bulbs do tend get installed, studies have shown that it is not at the rate assumed in the claimed savings.

> **Rationale:** Best practice is to follow the UMP. Likewise, it is important to track first-year ISRs (see Table D-15 and Table D-17) as those are the bulbs that are directly installed through the program. For the adjusted savings, AEG will continue to use the methodology outlined in the UMP.

Recommendation 3: LED baseline bulb type estimates should be normalized.

Even though federal lamp standards have changed, program home energy worksheets show there are still existing inefficient bulbs. Claimed savings in PY10 did not normalize LED baseline bulb estimates which understated LED bulbs' savings.

> **Rationale:** Home energy worksheet data can be noisy but normalizing the LED baseline bulb estimates and then applying an ISR is the simplest solution. Claimed savings calculations were effectively double-counting the uninstalled bulbs. See Table D-20 for an example of how AEG normalized the baseline blub types.

Recommendation 4: Since the 2021 PA TRM does not directly estimate tier 2 smart strip savings installed outside of entertainment centers (such as in a home office), consider piloting a kit with a tier 1 smart strip (either added to the kit or by replacing the tier 2 smart strip) to see the overall effect on savings.

> **Rationale:** AEG's analysis, shown in Figure D-1, that as long as 42% of the Energy Innovation Kit's smart strips are installed in entertainment centers, then tier 2 smart strips generate more savings on average than tier 1 smart strips. In PY10, 61% of installed smart strips were installed in entertainment centers—which is greater than the threshold needed, but a decrease compared to previous years. Likewise, the ISR could be higher for tier 1 smart strips compared to tier 2 smart strips. Tier 1 smart strips are easier to install and affect the user less as tier 2 smart strips detect idleness and tier 1 smart strips only respond to the power being turned off.

D

SCHOOL ENERGY EDUCATION IMPACT DETAILS

Per-Unit Savings Comparison

Take Action Kits

Table D-1, Table D-2, and Table D-3 show the units per kit, claimed per-unit energy savings, and adjusted per-unit energy savings for the measures in the Take Action kits in PY8, PY9, and PY10, respectively. The per-unit savings in these tables include only TRM inputs—except for LED bulbs in PY10 where survey inputs cannot be reasonably decoupled from the TRM inputs. In other words, the per-unit savings do not include ISRs, water heater fuel saturations, surveyed people per home, or surveyed showers per home. In Table D-3, the Take Action PY10 table, LED bulbs' per-unit savings include (claimed and adjusted)[31] surveyed baseline bulb type.

Also, in the following tables, we have a column labeled "Per-Unit Ratio." This is the ratio of the adjusted per-unit savings to the claimed per-unit savings. This is not the realization rate as the realization rate includes all adjustments such as ISR, water heater fuel type, etc. Its purpose is to quickly show the scale of the differences in per-unit savings.

Table D-1 School Energy Education—Take Action PY8 Per-Unit Energy Savings

Kit	Measure	Units Per Kit	Claimed Per-Unit kWh	Adjusted Per-Unit kWh	Per-Unit Ratio
Take Action PY8	Low flow showerhead	1	194.18	183.70	95%
	Low flow kitchen aerator	1	80.98	76.61	95%
	9W LED	3	35.00	35.02	100%
	Water heater setback[1]	1	165.90	155.94	94%

[1] Water heater setback is a recommended behavioral measure; participants indicate on the survey if they lowered the temperature on their water heater.

Table D-2 School Energy Education—Take Action PY9 Per-Unit Energy Savings

Kit	Measure	Units Per Kit	Claimed Per-Unit kWh	Adjusted Per-Unit kWh	Per-Unit Ratio
Take Action PY9	Low flow showerhead	1	195.05	183.70	94%
	Low flow kitchen aerator	1	81.34	76.61	94%
	Low flow bathroom aerator	1	28.92	16.32	56%
	11W BR30 LED	2	55.58	55.62	100%
	Water heater setback[1]	1	165.90	155.94	94%

[1] Water heater setback is a recommended behavioral measure; participants indicate on the survey if they lowered the temperature on their water heater.

[31] AEG re-calculated all the survey results using the raw data as provided by the implementer.

Table D-3 School Energy Education—Take Action PY10 Per-Unit Energy Savings

Kit	Measure	Units Per Kit	Claimed Per-Unit kWh	Adjusted Per-Unit kWh	Per-Unit Ratio
Take Action PY10	Low flow showerhead	1	207.77	195.68	94%
	Low flow kitchen aerator	1	87.76	82.65	94%
	Low flow bathroom aerator	1	26.62	25.07	94%
	11W BR30 LED	2	25.48	44.33	174%
	Water heater setback[1]	1	104.20	92.67	89%

[1] Water heater setback is a recommended behavioral measure; participants indicate on the survey if they lowered the temperature on their water heater.

Small differences in the claimed and adjusted energy savings are because:

- AEG accounted for the recovery efficiencies of heat pump water heaters in our adjusted savings.
    - About 2% of the population in Pennsylvania[32] have heat pump water heaters and savings for water heater measures—showerheads, aerators, and water heater setback—and heat pump water heaters are more efficient than standard electric water heaters and for homes with heat pump water heaters, savings from the aforementioned measures will be slightly lower.
- AEG corrected the inputs for low flow bathroom aerators in Take Action PY9 (as discussed in Table 2-12).
- AEG followed the PA TRM and used 365.25 as the days per year for LED bulb savings as opposed to 365 days per year.
- AEG corrected the surveyed baseline bulb type calculations for 11W BR30 LED bulbs in Take Action PY10 (see Table D-21) as the claimed survey results double-counted the uninstalled bulbs.

Table D-4, Table D-5, and Table D-6 show the claimed and adjusted per-unit peak demand savings for Take Action kits in PY8, PY9, and PY10.

Table D-4 School Energy Education—Take Action PY8 Per-Unit Peak Demand Savings

Kit	Measure	Units Per Kit	Claimed Per-Unit kW	Adjusted Per-Unit kW	Per-Unit Ratio
Take Action PY8	Low flow showerhead	1	0.0156	0.0147	95%
	Low flow kitchen aerator	1	0.0109	0.0103	95%
	9W LED	3	0.0038	0.0040	105%
	Water heater setback[1]	1	0.0133	0.0125	94%

[1] Water heater setback is a recommended behavioral measure; participants indicate on the survey if they lowered the temperature on their water heater.

[32] NMR Group, Inc. *2018 Pennsylvania Statewide Act 129 Residential Baseline Study.* February 12, 2019. https://www.puc.pa.gov/Electric/pdf/Act129/SWE-Phase3_Res_Baseline_Study_Rpt021219.pdf.

Table D-5 School Energy Education—Take Action PY9 Per-Unit Peak Demand Savings

Kit	Measure	Units Per Kit	Claimed Per-Unit kW	Adjusted Per-Unit kW	Per-Unit Ratio
Take Action PY9	Low flow showerhead	1	0.0261	0.0147	56%
	Low flow kitchen aerator	1	0.0109	0.0103	94%
	Low flow bathroom aerator	1	0.0039	0.0022	56%
	11W BR30 LED	2	0.000007	0.0064	87739%
	Water heater setback[1]	1	0.0133	0.0125	94%

[1] Water heater setback is a recommended behavioral measure; participants indicate on the survey if they lowered the temperature on their water heater.

Table D-6 School Energy Education—Take Action PY10 Per-Unit Peak Demand Savings

Kit	Measure	Units Per Kit	Claimed Per-Unit kWh	Adjusted Per-Unit kWh	Per-Unit Ratio
Take Action PY10	Low flow showerhead	1	0.0167	0.0157	94%
	Low flow kitchen aerator	1	0.0118	0.0111	94%
	Low flow bathroom aerator	1	0.0036	0.0034	94%
	11W BR30 LED	2	0.0022	0.0051	232%
	Water heater setback[1]	1	0.0084	0.0075	89%

[1] Water heater setback is a recommended behavioral measure; participants indicate on the survey if they lowered the temperature on their water heater.

All the differences in energy savings (as described above) also apply to demand savings. However, there are a few other small differences for demand savings:

- AEG used the correct coincidence factor LED bulbs in Take Action PY8.
  - Correct value was 0.106.
- AEG used the correct energy to demand factor for showerheads in Take Action PY9.
  - Correct value was 0.00008013.
- AEG corrected major issue of LED bulb demand savings being underreported by several orders of magnitude in Take Action PY9.

Energy Innovation Kits

Table D-7, Table D-8, and Table D-9 show the units per kit, claimed per-unit energy savings, and adjusted per-unit energy savings for the measures in the Energy Innovation kits in PY8, PY9, and PY10, respectively. The per-unit savings in these tables do not include ISRs, water heater fuel saturations, surveyed people per home, surveyed showers per home, and distribution of smart strip location. They do however include (claimed and adjusted)[33] surveyed baseline bulb type in PY10 as that input could not be reasonably decoupled.

[33] AEG re-calculated all the survey results using the raw data as provided by the implementer.

Table D-7 School Energy Education—Energy Innovation PY8 Per-Unit Energy Savings

Kit	Measure	Units Per Kit	Claimed Per-Unit kWh	Adjusted Per-Unit kWh	Per-Unit Ratio
Energy Innovation PY8	Low flow showerhead	1	195.05	183.70	94%
	Low flow kitchen aerator	1	81.34	76.61	94%
	Low flow bathroom aerator	1	28.92	16.32	56%
	9W LED	3	35.00	35.02	100%
	11W BR30	2	55.58	55.62	100%
	Tier 2 smart strip – entertainment[1]	1	307.42	307.42	100%
	Tier 2 smart strip – unspecified[1]		204.18	204.18	100%
	Water heater setback[2]	1	165.90	155.94	94%

[1] Each kit included one tier 2 smart strip. Savings depended on where it was installed. Both iterations are shown, and then the location distribution is applied later.
[2] Water heater setback is a recommended behavioral measure; participants indicate on the survey if they lowered the temperature on their water heater.

Table D-8 School Energy Education—Energy Innovation PY9 Per-Unit Energy Savings

Kit	Measure	Units Per Kit	Claimed Per-Unit kWh	Adjusted Per-Unit kWh	Per-Unit Ratio
Energy Innovation PY9	Low flow showerhead	1	195.05	183.70	94%
	Low flow kitchen aerator	1	81.34	76.61	94%
	Low flow bathroom aerator	1	28.92	16.32	56%
	11W BR30	2	55.58	55.62	100%
	Tier 2 smart strip – entertainment[1]	1	307.42	307.42	100%
	Tier 2 smart strip – unspecified[1]		204.18	204.18	100%
	Water heater setback[1]	1	165.90	155.94	94%

[1] Each kit included one tier 2 smart strip. Savings depended on where it was installed. Both iterations are shown, and then the location distribution is applied later.
[2] Water heater setback is a recommended behavioral measure; participants indicate on the survey if they lowered the temperature on their water heater.

Table D-9 School Energy Education— Energy Innovation PY10 Per-Unit Energy Savings

Kit	Measure	Units Per Kit	Claimed Per-Unit kWh	Adjusted Per-Unit kWh	Per-Unit Ratio
Energy Innovation PY10	Low flow showerhead	1	207.77	195.68	94%
	Low flow kitchen aerator	1	87.76	82.65	94%
	Low flow bathroom aerator	1	26.62	25.07	94%
	11W BR30	2	23.95	47.95	200%
	Tier 2 smart strip – entertainment[1]	1	190.66	190.66	100%
	Tier 2 smart strip – unspecified[1]		0	19.98	N/A
	Water heater setback[2]	1	104.20	92.67	89%

[1] Each kit included one tier 2 smart strip. Savings depended on where it was installed. Both iterations are shown, and then the location distribution is applied later. In PY10, claimed savings did not account unspecified tier 2 smart strips, but AEG did calculate savings for them.
[2] Water heater setback is a recommended behavioral measure; participants indicate on the survey if they lowered the temperature on their water heater.

The reasons for the differences in claimed and adjusted per-unit were similar for Energy Innovation and Take Action, but we repeat them here—

- AEG accounted for the recovery efficienciesA-9 of heat pump water heaters in our adjusted savings.
    - About 2% of the population in Pennsylvania have heat pump water heaters and savings for water heater measures—showerheads, aerators, and water heater setback—and heat pump water heaters are more efficient than standard electric water heaters and for homes with heat pump water heaters, savings from the aforementioned measures will be slightly lower.
- AEG corrected the inputs for low flow bathroom aerators in Energy Innovation PY8 and PY9 (as discussed in Table 2-12).
- AEG followed the PA TRM and used 365.25 as the days per year for LED bulb savings as opposed to 365 days per year.
- AEG corrected the surveyed baseline bulb type calculations for 11W BR30 LED bulbs in Energy Innovation PY10 (see Table D-21) as the claimed survey results double-counted the uninstalled bulbs.
- AEG estimated savings for tier 2 smart strips installed outside of entertainment centers (see Table D-24)

Table D-10, Table D-11, and Table D-12 show the claimed and adjusted per-unit peak demand savings for Energy Innovation kits in PY8, PY9, and PY10.

Table D-10 School Energy Education—Energy Innovation PY8 Per-Unit Peak Demand Savings

Kit	Measure	Units Per Kit	Claimed Per-Unit kW	Adjusted Per-Unit kW	Per-Unit Ratio
Energy Innovation PY8	Low flow showerhead	1	0.0156	0.0147	94%
	Low flow kitchen aerator	1	0.0465	0.0437	94%
	Low flow bathroom aerator	1	0.0165	0.0093	56%
	9W LED	3	0.0038	0.0040	105%
	11W BR30	2	0.0061	0.0064	105%
	Tier 2 smart strip – entertainment[1]	1	0.0316	0.0316	100%
	Tier 2 smart strip – unspecified[1]		0.0194	0.0194	100%
	Water heater setback[2]	1	0.0133	0.0125	94%

[1] Each kit included one tier 2 smart strip. Savings depended on where it was installed. Both iterations are shown, and then the location distribution is applied later.
[2] Water heater setback is a recommended behavioral measure; participants indicate on the survey if they lowered the temperature on their water heater.

Table D-11 School Energy Education—Energy Innovation PY9 Per-Unit Peak Demand Savings

Kit	Measure	Units Per Kit	Claimed Per-Unit kW	Adjusted Per-Unit kW	Per-Unit Ratio
Energy Innovation PY9	Low flow showerhead	1	0.0261	0.0147	56%
	Low flow kitchen aerator	1	0.0464	0.0442	95%
	Low flow bathroom aerator	1	0.0165	0.0094	57%
	11W BR30	2	0.000014	0.0064	47228%
	Tier 2 smart strip – entertainment[1]	1	0.0316	0.0316	100%
	Tier 2 smart strip – unspecified[1]		0.0194	0.0194	100%
	Water heater setback[1]	1	0.0133	0.0125	94%

[1] Each kit included one tier 2 smart strip. Savings depended on where it was installed. Both iterations are shown, and then the location distribution is applied later.
[2] Water heater setback is a recommended behavioral measure; participants indicate on the survey if they lowered the temperature on their water heater.

Table D-12 School Energy Education— Energy Innovation PY10 Per-Unit Peak Demand Savings

Kit	Measure	Units Per Kit	Claimed Per-Unit kW	Adjusted Per-Unit kW	Per-Unit Ratio
Energy Innovation PY10	Low flow showerhead	1	0.0167	0.0157	94%
	Low flow kitchen aerator	1	0.0493	0.0463	94%
	Low flow bathroom aerator	1	0.0150	0.0140	94%
	11W BR30	2	0.0021	0.0055	267%
	Tier 2 smart strip – entertainment[1]	1	0.0238	0.0219	92%
	Tier 2 smart strip – unspecified[1]		0	0.0023	N/A
	Water heater setback[2]	1	0.0084	0.0075	89%

[1] Each kit included one tier 2 smart strip. Savings depended on where it was installed. Both iterations are shown, and then the location distribution is applied later. In PY10, claimed savings did not account unspecified tier 2 smart strips, but AEG did calculate savings for them.
[2] Water heater setback is a recommended behavioral measure; participants indicate on the survey if they lowered the temperature on their water heater.

Like the Take Action Kits, all the differences in energy savings for Energy Innovation Kits also apply to demand savings. However, there are a few other small differences for demand savings:

- AEG used the correct energy to demand factor for showerheads in Energy Innovation PY9
    - Correct value was 0.00008013
- AEG corrected major issue of LED bulb demand savings being underreported by several orders of magnitude in Energy Innovation PY9
- AEG applied the default realization rate factor for tier 2 smart strips installed in entertainment centers in PY10. Claimed savings applied this factor for energy savings but not for demand savings.

Survey Inputs Comparison

AEG redid the survey analysis of each kit in each year. For the most part, our results were similar, but we did find minor differences—except for one major methodological change involving LED bulbs' ISRs. The following include all the survey inputs examined in this section:

- ISRs of all measures
- Water heater fuel saturation
- People per home
- Number of showers per home
- Baseline LED bulb type
- Tier 2 smart strips installation location

ISRs

Table D-13 shows claimed and adjusted ISRs for all the Take Action Kits' measures in PY8-PY10—with differences between years highlighted. Except for LED bulbs where we followed the methodology in the UMP[34], most of the time the differences were minimal and likely due to rounding or other miscellaneous smaller errors.

[34] Dimetrosky, S.; Parkinson, K.; Lieb, N. (2017). *Chapter 6: Residential Lighting Evaluation Protocol, The Uniform Methods Project: Methods for Determining Energy-Efficiency Savings for Specific Measures*. Golden, CO; National Renewable Energy Laboratory. NREL/SR-7A40-68562. http://www.nrel.gov/docs/fy17osti/68562.pdf

Table D-13 School Energy Education— Take Action Kits' Measure ISRs Comparison (Differences Highlighted)

Measure	PY8		PY9		PY10	
	Claimed	Adjusted	Claimed	Adjusted	Claimed	Adjusted
Low flow showerhead	56.1%	56.1%	36.4%	36.4%	43.0%	43.2%
Low flow kitchen aerator	58.9%	58.9%	37.7%	37.7%	40.0%	40.5%
Low flow bathroom aerator	N/A	N/A	37.4%	37.4%	41.0%	41.4%
9W LED[1]	96.5%	73.6%	N/A	N/A	N/A	N/A
11W BR30[1]	N/A	N/A	93.5%	75.5%	87.5%	66.9%
Water heater setback	12.4%	13.9%	25.4%	25.4%	11.0%	11.5%

[1] We are showing the simple average claimed and average adjusted ISRs for all LED bulbs in each year.

Table D-14 shows the derivation of the LED bulb ISRs using the methodology in the UMP using Take Action PY8 data for one of the LED bulbs. The UMP assumes that all uninstalled bulbs have a 24% of getting installed each year, for three years. The process is the same for all bulbs, and the result is in Table D-15 and reads as the final ISR for the Take Action PY8 LED bulb equals 78% and the percentage of uninstalled bulbs is 22%. AEG assumed that all uninstalled bulbs had a chance of getting installed.

Table D-14 School Energy Education— Example of LED Bulb ISR using Take Action PY8 Bulb[1]

Year	ISR	Cumulative Storage Rate	Source
First Year	61%	39%	Survey data
Second Year	61% + (39% * 24%) = 71%	39% - (39% * 24%) = 29%	Calculated
Third Year (Final ISR)	71% + (29% * 24%) = 78%	29% - (29% * 24%) = 22%	Calculated

[1] Table inputs are rounded and equations may not equal the final values to the right of the equal sign. The values to the left of the equal sign in the table are the rounded, final values based on actual calculations.

Table D-15 shows the claimed ISR compared to the adjusted savings' first year and final ISR of all Take Action LED bulbs in all years. The first year ISR of the bulbs represented about half of the claimed ISRs in all years.

Table D-15 School Energy Education— Take Action LED Bulbs' ISR Comparison

Kit and Year	Bulb	Claimed ISR	Adjusted ISR	
			First Year ISR	Final ISR
Take Action PY8	9W LED - 1	97%	61%	78%
	9W LED - 2	97%	54%	73%
	9W LED - 3	96%	48%	70%
Take Action PY9	11W BR30 - 1	94%	59%	76%
	11W BR30 - 2	93%	56%	74%
Take Action PY10	11W BR30 - 1	88%	44%	67%
	11W BR30 - 2	87%	42%	66%

Table D-16 shows the claimed and adjusted ISRs for all Energy Innovation measures.

Table D-16 School Energy Education— Energy Innovation Kits' Measure ISRs Comparison (Differences Highlighted)

Measure	PY8		PY9		PY10	
	Claimed	Adjusted	Claimed	Adjusted	Claimed	Adjusted
Low flow showerhead	58.9%	58.9%	57.9%	57.9%	56.0%	55.8%
Low flow kitchen aerator	48.7%	48.7%	52.3%	52.3%	52.0%	51.1%
Low flow bathroom aerator	50.2%	50.1%	55.1%	55.1%	56.0%	55.7%
9W LED[1]	95.5%	71.1%	N/A	N/A	N/A	N/A
11W BR30[1]	92.0%	62.4%	91.1%	59.0%	96.5%	55.9%
Tier 2 smart strips[2]	80.2%	83.8%	81.3%	81.3%	48.0%	77.0%
Water heater setback	6.0%	14.2%	8.5%	10.8%	10.0%	10.3%

[1] We are showing the simple average claimed and average adjusted ISRs for all LED bulbs in each year.
[2] For tier 2 smart strips, the ISR is the sum of all installed smart strips in each location (entertainment center or other)

Note that for tier 2 smart strips in PY10, the claimed savings did not include smart strips installed in non-entertainment centers in the total ISR because the 2021 PA TRM's residential smart strip section does not calculate savings for non-entertainment center tier 2 smart strips. However, AEG adapted the 2021 PA TRM's commercial tier 2 smart strip calculations (see Table D-24) and, thus, included it in the ISR.

Table D-17 shows Energy Innovation's LED bulbs' claimed, first year and final ISRs by year.

Table D-17 School Energy Education— Energy Innovation LED Bulbs' ISR Comparison

Kit and Year	Bulb	Claimed ISR	Adjusted ISR	
			First Year ISR	Final ISR
Energy Innovation PY8	9W LED - 1	96%	55%	74%
	9W LED - 2	96%	51%	72%
	9W LED - 3	95%	44%	67%
	11W BR30 - 1	93%	37%	63%
	11W BR30 - 2	91%	33%	61%
Energy Innovation PY9	11W BR30 - 1	91%	29%	59%
	11W BR30 - 2	91%	29%	59%
Energy Innovation PY10	11W BR30 - 1	97%	28%	57%
	11W BR30 - 2	96%	25%	55%

Water Heater Inputs

The water heater survey inputs are water heater fuel type saturations, people per home, and surveyed showers per home. Table D-18 shows Take Action's and Energy Innovation's claimed and adjusted electric water heater fuel saturations in all years.

Table D-18 School Energy Education— Electric Water Heater Comparison (Differences Highlighted)

Kit	Year	%Electric Water Heater	
		Claimed	Adjusted
Take Action	PY8	39.5%	39.5%
	PY9	40.7%	40.7%
	PY10	48.0%	48.5%
Energy Innovation	PY8	39.2%	39.2%
	PY9	37.9%	41.5%
	PY10	39.0%	39.4%

Table D-19 shows the comparison of claimed and adjusted people per home and showers per home.

Table D-19 School Energy Education— People per Home and Showers per Home Comparison (Differences Highlighted)

Kit	Year	People per home		Showers per home	
		Claimed	Adjusted	Claimed	Adjusted
Take Action	PY8	4.45	4.43	1.60	1.60
	PY9	4.14	4.16	1.82	1.82
	PY10	4.55	4.55	1.74	1.74
Energy Innovation	PY8	4.26	4.26	1.96	1.96
	PY9	4.26	4.31	1.69	1.69
	PY10	4.19	4.18	1.69	1.63

Again, these differences are generally quite small. However, when multiplied by the number of measures in each kit, the differences do accumulate.

LED Baseline Bulb Types

In PY8 and PY9, AEG and the implementer used the EISA baseline tables in the 2016 PA TRM to determine the baseline LED wattage. In PY10, the implementer used a survey determine the baseline bulb type. The implementer double-counted uninstalled bulbs the baseline bulb calculation and in the ISR. AEG fixed this, which increased the savings. Table D-20 shows an example of the claimed baseline bulb type calculations compared to AEG's baseline bulb calculations. The implementer did this for all PY10 program bulbs. Table D-21 compares claimed and adjusted PY10 baseline wattages for Take Action and Energy Innovation kits.

Table D-20 School Energy Education— PY10 Baseline Bulb Derivation Comparison

Kit and Year	Bulb	Survey Response—Baseline Wattage Estimate	Assumed Baseline Wattage	Survey Response
Take Action PY10	11W BR30 - 1	9 – 26	17.5	8%
		40	40	16%
		60	60	34%
		75	75	7%
		Greater than or equal to 100	100	3%
		Claimed Baseline Average	**36.41[1]**	**69%**
		Adjusted Baseline Average (survey results normalized to 100%)	**53.91**	**100%**

[1] Actual reported baseline average shown. The calculations in this table yield a baseline wattage of 37.08 W. The difference is likely due to rounding or to different assumed baseline wattages from mapping the survey responses to a numerical value (i.e., in the first row AEG used the median of 9 to 26 or 17.5).

Table D-21 School Energy Education— PY10 Baseline Bulb Comparison of All Bulbs

Kit	Bulb	Claimed Baseline Wattage	Adjusted Baseline Wattage
Take Action PY10	11W BR30 - 1	36.41	53.91
	11W BR30 - 2	35.09	54.23
Energy Innovation PY10	11W BR30 - 1	34.97	49.80
	11W BR30 - 2	33.57	65.37

Tier 2 Smart Strip Locations

The final survey inputs used were for tier 2 smart strips. The survey asked where participants installed the tier 2 smart strip—entertainment center or unspecified—and the ISR was calculated as the sum of those. Table D-22 shows the summary of claimed and adjusted tier 2 smart strip survey results.

Table D-22 School Energy Education— Energy Innovation Tier 2 Smart Inputs Comparison (Differences Highlighted)

Kit	Location	Distribution		Total ISR	
		Claimed	Adjusted	Claimed	Adjusted
Energy Innovation PY8	Entertainment center	56.8%	56.8%	80.2%	80.2%
	Unspecified	23.4%	23.4%		
Energy Innovation PY9	Entertainment center	48.1%	48.1%	81.3%	81.3%
	Unspecified	33.2%	33.2%		
Energy Innovation PY10	Entertainment center	48.0%	47.2%	78.0%	77.0%
	Unspecified	30.0%	29.8%		

Tier 2 Smart Strips in the 2021 PA TRM

Savings Derivation

The 2021 PA TRM no longer has explicitly defined savings for tier 2 smart strips installed outside of entertainment centers in residential applications. Because some of the Energy Innovation PY10 smart strips were installed outside of entertainment centers, AEG adapted section 3.9.3 of the 2021 PA TRM—C&I advanced

power strips—which has savings iterations for smart strips installed in offices. AEG made conservative assumptions as C&I office loads are typically higher than residential office loads. Table D-23 shows the default savings that AEG used from section 3.9.3 of the 2021 PA TRM.

Table D-23 School Energy Education— Tier 2 Smart Strips in 2021 PA TRM

Strip Type	Use	Energy Savings (kWh)	Demand Savings (kW)	Reason for Selection
Tier 2	Workstation with power management (network or local)	21.72	0.0025	Most conservative option

Likewise, AEG applied the default realization rate factor in the residential section of the TRM to the adapted smart strip iteration in Table D-23. This means that we multiplied savings by 92% which yielded the results in Table D-24.

Table D-24 School Energy Education— PY10 Tier 2 Smart Strips Final "Unspecified" Savings

Strip Type	Use	Default RR	Energy Savings (kWh)	Demand Savings (kW)	Reason for Selection
Tier 2	Unspecified	92%	19.98	0.0023	Most conservative option multiplied by default residential realization rate

Effect on Program Savings

Because AEG's estimate of tier 2 smart strips in unspecified locations is conservative, it changes the optimal savings calculus compared to the 2016 PA TRM. In the 2016 PA TRM, where tier 2 smart strips had per-unit deemed savings of about 300 kWh (entertainment centers) and 200 kWh (unspecified), tier 2 smart strips saved much more than tier 1 smart strips—regardless of the distribution of smart strips in entertainment centers vs unspecified did not matter. Now, it could matter.

Table D-25 compares tier 1 and tier 2 smart strip savings in the 2021 PA TRM.

Table D-25 School Energy Education— 2021 PA TRM Smart Strip Comparison

Application	Tier 2 Energy Savings (kWh)	Tier 1 Energy Savings (kWh)
Entertainment centers	190.66	116.98
Unspecified	19.98	77.09

Figure D-1 compares tier 2 and tier 1 energy savings based on the distribution of smart strips installed in entertainment centers. For instance, if 100% of smart strips are installed in entertainment centers, that would mean 0% are installed in unspecified and all the savings on the graph would come from entertainment centers. Likewise, this figure does not consider ISRs. It could be the case the tier 1 smart strips have different ISRs than tier 2 smart strips. We did not consider that in this analysis.

Figure D-1 Comparison of Tier 2 and Tier 1 Smart Strips in the 2021 PA TRM

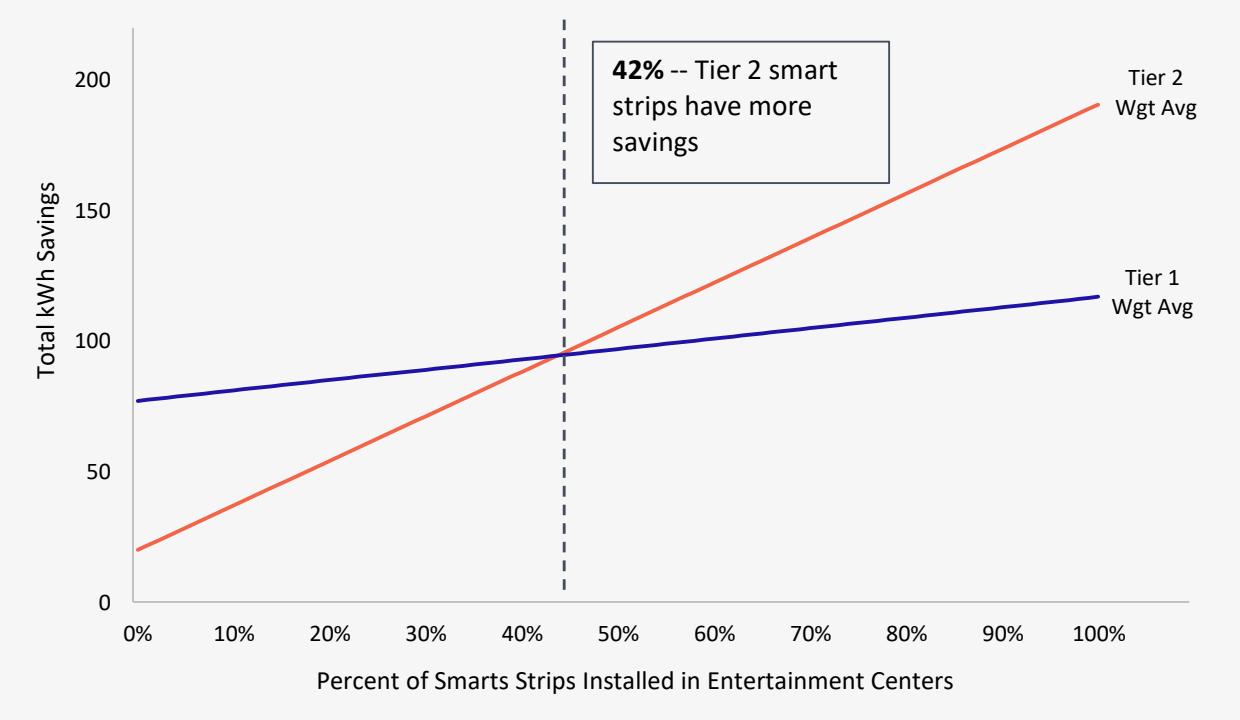


Figure D-1 shows that once 42% of the installed smart strip in the kit is installed in entertainment centers, then the total savings of tier 2 smart strips would be higher than tier 1 smart strips. If less than 42% of smart strips are installed in entertainment centers, then it would have been more optimal to give students tier 1 smart strips. If we attributed no savings to tier 2 smart strips installed outside of entertainment centers, then the point at which tier 2 smart strips have more total savings than tier 1 smart strips is 53% of installed smart strips must be installed in entertainment centers.

Based on past program data, this has not been an issue. Table D-26 shows the average distribution of entertainment centers and others. However, going forward, it should be closely monitored.

Table D-26 School Energy Education— Energy Innovation Past Tier 2 Smart Strip Install Data

Year	% Entertainment Center	%Unspecified
PY8	71%	29%
PY9	59%	41%
PY10	61%	39%

UGI Electric Exhibit TML-7R

UGI Utilities, Inc. – Electric Division
Phase IV of its Energy Efficiency and Conservation Plan
Docket No. M-2023-3043230
UGI TO OCA – SET I

OCA-I-17

Please reference OCA Statement 1, p. 23.

(a) Please explain in detail whether Ms. Sherwood believes that the only benefit from the School Energy Program is derived from the measures within the kits provided.

(b) Please explain in detail whether Ms. Sherwood believes that the only benefit from the Energy Kits program comes from the measures within the kits provided.

(c) Is Ms. Sherwood aware of other Pennsylvania EDCs that provide energy efficiency kits as part of their EE&C programs? If so, please provide a list of the other Pennsylvania EDCs, of which she is aware, that provide energy efficiency kits.

(d) Please explain in detail whether Ms. Sherwood believes that all energy efficiency program administrators should not offer energy efficiency kits and provide all documents relied upon her to reach that conclusion and in responding to this interrogatory.

Response:

(a) The primary benefit of the School Energy Program is the savings derived from measures provided in the kits, particularly as this is an energy efficiency program. There are other benefits, such as education on energy and associated benefits captured as part of the TRC test.

(b) Please see response to (a).

(c) Ms. Sherwood is generally aware that the program offerings exist in other EDCs' Plans, but does not know the specifics related to those programs. It is her understanding that the following EDCs offer an energy efficiency kit in some capacity: PPL Electric Utilities Corporation (PPL), Duquesne Light, Metropolitan Edison Company, Pennsylvania Electric Company, Pennsylvania Power Company, West Penn Power Company, and PECO.

(d) Ms. Sherwood is offering her recommendations based upon the Company's Phase IV Plan discussed in this proceeding and will not make a blanket statement on energy efficiency kits, as it is dependent on several factors, including overall measure mix in

a portfolio, the service territory in which it is offered, potential saturation levels, and historical participation levels.

UGI Electric Exhibit TML-8R

UGI Utilities, Inc. – Electric Division
Phase IV of its Energy Efficiency and Conservation Plan
Docket No. M-2023-3043230
UGI TO OCA – SET I

OCA-I-11

Please reference OCA Statement 1, p. 18.

(a) Is Ms. Sherwood aware of other Pennsylvania electric distribution companies ("EDCs") that offer fuel switching measures? If so, please provide a list of the other Pennsylvania EDCs, of which she is aware, that offer fuel switching measures.

(b) Does Ms. Sherwood agree that fuel switching measures are included in the Commission's current TRM?

Response:

(a) Ms. Sherwood is aware that PPL Electric Utilities Corporation (PPL) has an electric-to-gas fuel switching in its residential program that was approved as part of a settlement approved by the Commission at Docket No. M-2020-3020824. In that settlement, PPL agreed to cap or limit the number of customers to 75 in each measure.

(b) Ms. Sherwood does agree that fuel switching measures are included in the current TRM.

UGI Electric Exhibit TML-9R

UGI Utilities, Inc. – Electric Division
Phase IV of its Energy Efficiency and Conservation Plan
Docket No. M-2023-3043230
UGI TO OCA – SET I

OCA-I-23

Please reference OCA Statement 1, p. 27.

(a) Has Ms. Sherwood spoken with HVAC companies regarding the level of training their technicians receive and whether or not that training entails how to properly size HVAC equipment?

(iii) If yes, please provide a detailed description of those communications and all supporting documents relied upon in providing the response.

(iv) If no, why not?

(b) Please provide any analysis performed by Ms. Sherwood on the level of training HVAC technicians receive regarding how to properly size HVAC equipment.

(c) Please provide the applicable entity and anticipated costs related to providing contractor training on properly sizing HVAC equipment.

(d) Please provide the applicable entity and anticipated costs related to promoting weatherization.

Response:

(a) No, Ms. Sherwood has not spoken with HVAC companies in the UGI Electric service territory. Her statement does not indicate that HVAC companies are not trained on properly sizing equipment. Rather, the statement here is about properly sizing equipment for the home by following an order of measure installation, which involves tightening the envelope of the home to reduce air leakage, as it can change the sizing of the HVAC equipment.

(b) Ms. Sherwood did not perform an analysis on training levels of HVAC technicians.

(c) Ms. Sherwood is not qualified to offer this information.

(d) Ms. Sherwood is not qualified to offer this information.

UGI Electric Exhibit TML-10R

UGI Utilities, Inc. – Electric Division
Phase IV of its Energy Efficiency and Conservation Plan
Docket No. M-2023-3043230
UGI TO OCA – SET I

OCA-I-15

Please reference OCA Statement 1, p. 20. Ms. Sherwood states, "The Company should run a sensitivity analysis to determine how historical levels of participation and increasing interest in electrification measures may impact the program's costs and cost-effectiveness."

(a) What does Ms. Sherwood deem to be "historical levels of participation"?

(b) How would "historical levels of participation" be determined for measures that have not had rebates offered in the UGI Electric Appliance Rebate Program?

(c) Should weatherization measures be included in this sensitivity analysis? Why or why not?

(d) How should the sensitivity analysis be used?

(e) Please provide anticipated costs and the applicable entity that should perform the "sensitivity analysis" that Ms. Sherwood recommends.

Response:

(a) Historical levels of participation should consider prior program participation averages and trends, including declining or inclining levels of participation from recent program years.

(b) For rebates that have not previously been offered, the Company could develop low, medium, and high participation scenarios. However, in this reference, the sensitivity analysis could be limited to measures that have been previously offered.

(c) The Company does not offer weatherization levels, but as noted in response to (b), it could develop various levels of participation.

(d) A sensitivity analysis should be used to propose reasonable levels of participation.

(e) The analysis could be conducted by the Company and its current entity that supports the plan development. This analysis should have been considered as part of the development of the plan. Anticipated costs are dependent on several factors, including the entity that would perform the work and scope of work. The Company could perform a sensitivity analysis in-house or issue a request for proposal or request for information to evaluate the entities that are appropriate to perform this work.

BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

PETITION OF UGI UTILITIES, INC. – ELECTRIC DIVISION
FOR APPROVAL OF PHASE IV OF ITS
ENERGY EFFICIENCY AND CONSERVATION PLAN

DOCKET NO. M-2023-3043230

REJOINDER TESTIMONY
OF
THEODORE M. LOVE

UGI ELECTRIC STATEMENT NO. 1-RJ

January 11, 2024

I. INTRODUCTION

Q. Please state your full name, occupation, and business address.

A. My name is Theodore M. Love, and I am a Partner at Green Energy Economics Group, Inc. ("GEEG"), an energy consulting firm founded in 2005. My business address is 2534 Downingsville Rd., Lincoln, VT 05443.

Q. Did you previously submit testimony in this proceeding on behalf of UGI Utilities, Inc. – Electric Division ("UGI Electric" or the "Company")?

A. Yes. I submitted my direct testimony, UGI Electric Statement No. 1, on September 21, 2023, and my rebuttal testimony, UGI Electric Statement No. 1-R, on December 22, 2023.

Q. Would you please describe the purpose of your rejoinder testimony in this proceeding?

A. My rejoinder testimony responds to certain portions of the surrebuttal testimony submitted concerning UGI Electric's proposed Phase IV Energy Efficiency and Conservation ("EE&C") Plan ("EE&C Plan" or "Plan"), specifically: OCA Statement 1SR, the surrebuttal testimony of Stacy Sherwood submitted on behalf of the Office of Consumer Advocate ("OCA"). I have already commented extensively on the issues raised by OCA in this proceeding, so my failure to address an issue in the rejoinder is not an indication of my agreement with their position. My rejoinder testimony is intended to focus exclusively on issues and arguments that have not previously been addressed in my direct and rebuttal testimony. In

addition, my rejoinder testimony makes certain further modifications to the Company's filed Plan.

II. OCA WITNESS SHERWOOD

Q. OCA Witness Sherwood alleges that the Company "seemed to ignore the performance in Program Year ("PY") 10 and PY 11, where participation in the Appliance Rebate Program dropped significantly." (OCA St. 1SR, p. 2.) Is that correct?

A. No. PY 10 and PY 11 performance was extensively examined in my rebuttal testimony (UGI Electric St. No. 1-R) on pages 27 through 29. While overall participation counts related to the Appliance Rebate Program dipped along with lower marketing spends, PY 10 and PY 11 saw significant growth in ductless mini-split heat pump ("DMHP") participation compared to previous years, which led to an overall increase in incentive spending across those two years. This upward trend in DMHP, combined with newly added rebates for heat pump water heaters ("HPWH") and air source heat pumps ("ASHP"), and the utilization of additional marketing budget, formed the basis for the Company's total projected participation rates in the Appliance Rebate Program. I would note that Ms. Sherwood does not address these factors in her surrebuttal testimony.

Q. Ms. Sherwood also alleges that participation was explored only for "HVAC and non-HVAC" measures (OCA St. 1SR, p. 3). Is that correct?

A. No. Figure 1 from my rebuttal testimony compares "heat pumps" and "non-heat pumps." Heat pumps include some HVAC measures, ASHP and DMHP, water heaters, HPWHs. Heat pumps do not include other HVAC measures like central air conditioners or room air conditioners or HVAC controls, or measures such as Wi-Fi-enabled thermostats. Furthermore, I discussed in detail projections for DMHP, which account for 72% of the projected incentive spending and 78% of projected first year energy savings for the Appliance Rebate Program.

Q. Ms. Sherwood continues to recommend that the Company perform a sensitivity analysis to determine how historical levels of participation and increasing interest in electrification measures may impact the Appliance Rebate Program's costs and cost-effectiveness. Do you have any further response to this recommendation?

A. I continue to believe that a sensitivity analysis is unnecessary. In addition to the reasons I've already enumerated on page 50 of my rebuttal testimony (*see* UGI Electric St. No. 1-R), I would also note that requiring the Company to perform a sensitivity analysis would increase the administrative costs and tasks related to administering the Appliance Rebate Program and result in additional costs to the consumers, all in service to an analysis with no clear benefit or mandate. In particular, as related to the impacts of increasing interest in electrification measures, Ms. Sherwood has not specified what areas of interest would be explored as part of

any sensitivity analysis. A broad and generalized analysis of "increasing interest" can be quite extensive and expensive and have no clear linkage or impact on the Company's programs. For example, IRA tax credits and rebates are still in the roll-out phase and without some level of results in hand, determining the level of impact and interest would be largely a function of guessing at this early stage.

Q. Ms. Sherwood continues to oppose the Company's inclusion of fuel switching measures in its Plan. What reasons does Ms. Sherwood provide for her opposition to the fuel switching program in her surrebuttal testimony?

A. Ms. Sherwood provides the following arguments against the inclusion of fuel switching in UGI Electric's Plan on pages 5 through 7 of her surrebuttal testimony:

(1) Inclusion of a measure in the Technical Reference Manual ("TRM") is not a sufficient basis to be included as part of a portfolio;

(2) Comparison to the "fuel switching pilot" offered by PPL Electric Utilities Corporation ("PPL") is not a reasonable reference to support including fuel switching measures in UGI Electric's Plan because UGI Electric is not subject to penalties for failing to achieve savings targets, while PPL is;

(3) The priority of the national Inflation Reduction Act ("IRA") is not to incentivize natural gas equipment, but rather to reduce the usage of fossil fuels;

(4) DMHP are more popular than fuel switching measures;

(5) The Company's gas division, UGI Gas, would be the beneficiary of switching from electric heating to natural gas heating; and

(6) UGI Electric's ratepayers could be harmed by the permanent removal of electric heating load from the system because it reduces sales.

Q. Do you agree with these concerns?

A. No. To address Ms. Sherwood's first point, I agree that the inclusion of a measure in the TRM does not also require that measure be implemented in energy efficiency programs. However, its inclusion in the TRM does show that it has a valid and approved methodology for calculating savings that can be counted under an energy efficiency plan, and that it is therefore one of a number of measures which are appropriate to consider for inclusion within a portfolio of programs targeting energy efficiency goals. Thus, while the Commission's TRM forms the basis for numerous measures that can be considered as part of an EE&C plan, it does not prescriptively specify that inclusion in the TRM *requires* inclusion in an EE&C plan; EDCs are provided a level of discretion as to which individual plan measures are included, subject to overall TRC criteria. Moreover, if it was the Commission's desire to exclude fuel-switching programs from EE&C plans, the Commission could remove those measures from the TRM.

Q. Are measures related to switching fuels from electricity to natural gas only a "pilot" at PPL, as Ms. Sherwood states on page 5 of her surrebuttal?

A. No. PPL, and UGI Electric, have offered fuel switching rebates for customers switching to natural gas space heating since the establishment of their energy efficiency portfolios over a decade ago. Fuel switching has never been a "pilot"

program, and after a decade of experience these measures are well beyond the realm of "pilot" status. In addition, the Commonwealth has a rich history of electric rate payers funding the switch to natural gas for combined-heat and power ("CHP") projects, which have much higher incentives and budget impacts than those offered for the residential space heating fuel-switching measures due to the significant benefits of CHP applications. CHP projects are currently, or have been, part of the plans offered by PPL, PECO Energy Company ("PECO"), FirstEnergy Pennsylvania Electric Company ("First Energy") (formerly, Metropolitan Edison Company, Pennsylvania Electric Company, Pennsylvania Power Company, and West Penn Power Company), and Duquesne Light Company.

Q. Is it reasonable for UGI Electric to reference PPL's program as support for offering a similar program?

A. Yes. While it is true that UGI Electric will not be penalized like PPL would be for missing savings targets, UGI Electric is still following the main principle of Act 129, which is to reduce electric energy consumption and demand. *See* 66 Pa. C.S. § 2806.1(a). Fuel switching clearly does this, and it has approved methodologies for calculating these reductions in the Act 129 TRM.

Q. Do you agree with Ms. Sherwood's characterization of the priorities of the Inflation Reduction Act?

A. No. Ms. Sherwood states that the IRA "rebates are focused on supporting home energy efficiency electrification projects and reducing the reliance on fossil fuels."

(OCA St. 1SR, p. 6). While the individual rebate programs focus on heat pumps and weatherization, this is a feature of the program and not necessarily the overall policy goal for the IRA.

Q. Do UGI Electric's fuel switching measures align with the goals of the IRA?

As related to the IRA, a Whitehouse statement purports that "[t]he Inflation Reduction Act is a transformative law that is helping the United States meet its climate goals and strengthen energy security, investing in America to create good-paying jobs, reducing energy and health care costs for families, and making the tax code fairer."[1] Specifically, as related to customers electing to participate in UGI Electric's fuel-switching program, a conversion from electric to natural gas heating helps meet climate goals as total carbon emissions are reduced, as I will describe later in my testimony. Energy security is strengthened as natural gas is a domestically produced energy source, with Pennsylvania being second in the nation in natural gas production. As use of natural gas expands, the United States can reduce dependence on foreign energy sources such as oil and move toward greater energy security. Good paying jobs are supported where decisions are being made to engage HVAC contracting resources in particular to perform fuel switching appliance work. Lastly, and of material importance, customers who fuel switch are anticipated to see significant reductions in their energy costs from home heating. The U.S. Department of Energy determined that natural gas costs are 3.3 times

[1] *See* https://www.whitehouse.gov/briefing-room/statements-releases/2023/08/16/fact-sheet-one-year-in-president-bidens-inflation-reduction-act-is-driving-historic-climate-action-and-investing-in-america-to-create-good-paying-jobs-and-reduce-costs/#:~:text=The%20Inflation%20Reduction%20Act%20is,making%20the%20tax%20code%20fairer.

more affordable than electricity and other residential fuels.[2] Thus, as is demonstrated above, UGI Electric's fuel-switching program is fully supportive of stated IRA goals. Ms. Sherwood's arguments related to the IRA are incomplete and misleading and do not support the termination of the Company's fuel switching program.

Q. Do you have any further comments on this?

A. Yes. At this time, electric heating is not necessarily the lowest source of greenhouse gas emissions for space heating for residential customers in Pennsylvania. More than 60% of the Commonwealth's electric generation mix is from fossil fuels.[3] Electrical system energy losses (*i.e.*, the loss of British Thermal Units that occurs from the conversion of fuel to electricity at the generator and losses associated with transportation/distribution activities to deliver electricity to a customer) are approximately 65% of the potential energy of any fossil fuel generation source.[4] As a result, electric home heating in Pennsylvania is significantly less energy efficient than high efficiency natural gas heating equipment when all required energy use is considered.

[2] *See* https://www.aga.org/news/news-releases/doe-announces-natural-gas-is-3-3-times-more-affordable-than-electricity/.
[3] *See* https://www.eia.gov/state/?sid=PA,
[4] *See* https://www.eia.gov/energyexplained/us-energy-facts/images/consumption-by-source-and-sector.pdf.

Q. When considering emissions impacts, what is the effect of Ms. Sherwood's proposal related to fuel switching?

A. All else being equal, Ms. Sherwood's analysis would deprive customers of the ability to reduce their emissions footprint and lower their bills. Customers switching to natural gas heating reduce their CO2 emissions, and, moreover, also experience dramatically lower winter heating bills. For example, for a family of four living in a house that is 1,900 square feet, with average insulation and existing equipment that is between 3 and 15 years old, switching to natural gas would save approximately 19,000 pounds of CO2 per year compared to electric baseboard heat.[5] That same household would save approximately $1,400 per year by switching from electric baseboard heat to natural gas.

Q. Are DMHP upgrades more popular than fuel switching?

A. Yes. As the Company has projected and as Ms. Sherwood points out, there are significantly more DMHP rebates projected than those for fuel switching to gas space heating.

Q. Does that mean that fuel switching measures are not popular and should not be offered?

A. No. There is room for both offerings in a comprehensive Appliance Rebate program and this program supports real world decisions being made by UGI Electric customers, albeit smaller in number.

[5] *See* https://www.ugi.com/gas-for-homes/savings-calculator.

Q. Ms. Sherwood's fifth reason for opposing the fuel switching program is that UGI Electric's affiliate, UGI Gas, is the only natural gas company that will see an increase in customers (OCA St. 1SR, p. 7). Is this a legitimate basis for criticizing the program?

A. No. The Plan only projects eight conversions a year, however the impact of these conversions will decrease UGI Electric's revenue by more than the added customers will increase UGI Gas's revenue. Ultimately, the net effect of the fuel switching program on UGI Utilities, Inc., which includes both UGI Electric and UGI Gas, is a reduction in overall revenue.

Q. Ms. Sherwood suggests that UGI Electric's ratepayers potentially would be harmed by the permanent removal of electric heating load from the system because it will permanently reduce sales across which the electric utility company's fixed costs can be spread for determining base rates. (OCA St. 1SR, p. 7.) How do you respond? ?

A. Ms. Sherwood's argument is in error for two clear reasons. First, these customers will all continue to be UGI Electric customers and fixed costs can continue to be spread to these customers through the customer charge of the rate schedule. Fuel switching customers do not cease to have other electric needs, they simply lower their winter heating bills through more efficient energy use. Second, to the extent Ms. Sherwood believes that a reduction in load associated with this program has a negative rate impact, that is universally true of all of the Company's EE&C

measures. Every measure in the portfolio reduces that customer's overall electric consumption, marginally shifting the allocation of distribution rates. Ms. Sherwood's criticism of the rate impacts associated with fuel switching resulting in lower energy use would undermine the entire purpose of Act 129.

Q. Ms. Sherwood claims the fuel switching program is not cost effective in support of suggesting it be eliminated. (OCA St. 1SR, p. 7.) Please respond.

A. As related to fuel-switching measures, Ms. Sherwood appears to advocate an approach that because the cost-effectiveness Benefit Cost Ratio ("BCR") is less than 1.0, that it should not be part of UGI Electric's program. However, Ms. Sherwood is not advocating the same approach for other measures where BCR values are less than 1.0 (such as heat pump water heaters), and in fact criticizes UGI Electric for not offering more programs that may be cost-ineffective based on the TRC but provide value to customers. Her position is inconsistent and does not support the elimination of UGI Electric's fuel switching program.

Further, I am advised by counsel that across four phases of Act 129 and UGI Electric's own voluntary EE&C plan, the Commission has never required individual measures to be cost-effective. The cost-effectiveness requirement is for the whole EE&C portfolio, not individual programs or individual measures, and UGI Electric's overall EE&C portfolio, as Ms. Sherwood admits on page 9 of her surrebuttal, is cost-effective even with the inclusion of these fuel switching measures.

Q. Ms. Sherwood also criticizes the fuel switching measures because they allegedly have "excessive" rebate amounts and insufficient efficiency requirements. (OCA St. 1SR, pp. 7-8.) Please respond.

A. Ms. Sherwood provides no basis for her position that the rebates are excessive. After criticizing UGI Electric's reference to PPL's program, she relies exclusively on PPL's program as the basis for the size of the rebates. If, as Ms. Sherwood suggests, the rebates were excessive, UGI Electric would see excessive numbers of participants to the fuel switching program. The fact that there remains a steady and modest level of participation is evidence that Ms. Sherwood's assertion is incorrect.

Further, the Company notes that it has had $1,500 rebates since the outset of its Phase I program more than ten years ago. In that time, customers have experienced many cost-increasing impacts. For example, inflation has increased substantially, the cost of equipment has increased, and the costs associated with installation have gone up. It is not logical or appropriate to reduce the level of equipment rebates at this time, and Ms. Sherwood has not provided any credible basis for doing so.

Q. If the Commission approves the inclusion of fuel switching measures in the Plan, Ms. Sherwood recommends that certain parameters be imposed for the Company's fuel switching measures. Can you please summarize her recommendations?

A. Ms. Sherwood claims that UGI Electric offers fuel switching rebates for equipment that has lower efficiency levels compared to other programs with furnace and boiler

offerings. (OCA 1SR, p. 8). She states that "other states have requirements that equipment be equal to or greater than 97% Annual Fuel Utilization Efficiency ("AFUE") for natural gas furnaces and 95% AFUE for natural gas boilers."

Q. Do you agree with Ms. Sherwood that the Company's required efficiency levels should be increased?

A. No, I do not. UGI Electric's program requires customers to install ENERGY STAR certified equipment. ENERGY STAR is a federal program that helps consumers to identify highly energy efficient equipment. Utilizing this well-known and trusted government program as the basis for the fuel switching program provides customers with easy to understand rebate eligibility criteria, and maintains a broad range of products and price ranges to choose from, all while ensuring that qualifying customers will experience reduced energy consumption. Also, increasing the efficiency threshold for qualifying equipment will increase participant costs and may price this equipment out of reach for low and moderate income customers who are least likely to be able to afford the significant out of pocket costs associated with installing a 97% or higher AFUE, but would also be most likely to benefit from lowering their winter heating bills. Finally, I note that Ms. Sherwood does not identify any Pennsylvania EDCs using more narrow parameters for determining the eligibility of fuel switching equipment than those relied upon by UGI Electric, and she does not identify which states she is referencing for their higher efficiency standards. As a result, I cannot verify the efficiency levels used or evaluate the policy and operating differences that may exist between those other states and

Pennsylvania. Moreover, there are significant energy savings to be achieved at the as-specified appliance efficiency levels contained within UGI Electric's programs.

Q. Do you agree with her concerns with free ridership for this measure?

A. No, I do not. I find Ms. Sherwood's concerns regarding free ridership to be at odds with her request to reduce incentive levels. In my experience, decreasing rebate levels significantly would lead to higher rates of free ridership. A lower rebate would cover less of the incremental cost, which would make it harder for customers to overcome the first cost barrier, unless they were already going to pursue the action.

Q. Ms. Sherwood also proposes additional language be included in marketing materials and on the Company's website. Do you think this is appropriate?

A. No, I do not. There is no basis for UGI Electric to identify that customers who seek a fuel switching rebate will be subject to UGI Gas's Commission-approved tariff for two reasons. First, the UGI Electric program is tied specifically to equipment, and not to the service or servicing surrounding the equipment. For example, UGI Electric does not include additional language with its Energy Efficiency Kits in order to note "the installation of a low flow water saving showerhead or faucet may subject you to fees for a qualified plumber" or that as related to the installation of any new heating equipment "the installation of new heating equipment may subject you to costs related to electric service panel upgrades or electric upgrades related to code compliance." Second, as part of signing up for service with UGI Gas,

customers will be introduced to the rules surrounding their gas service. Ms. Sherwood's proposal would needlessly add language to UGI Electric's website and program materials that would be duplicative, voluminous, and ultimately not of material use to program participants.

Q. Do you have any final comments on the OCA's position on fuel switching?

A. I do. Based on its testimony, OCA's position on fuel switching appears driven primarily by federal activities. Nowhere in Ms. Sherwood's testimony does she ground her proposal in the plain language of Act 129 or any of the Commission's past treatment of fuel switching programs, nor does she even tie her proposal to Pennsylvania specific policies. As I have shown, Ms. Sherwood misinterprets federal policy, and then misapplies that errant policy to the facts surrounding fuel switching. Further, the OCA's position would deprive UGI Electric customers of an avenue for achieving significant cost savings, significant electric usage reductions, and significant carbon emissions reductions. Her position should not be adopted by the Commission.

Q. Ms. Sherwood continues to support the inclusion of a weatherization program. She criticizes the Company's position regarding weatherization measures and alleges that "it is unclear what the Company means by" the weatherization measures being "not successful" in the past. (OCA St. 1SR, pp. 10-11.) Please respond.

A. UGI Electric had a home energy audit program that was implemented as part of its Phase II EE&C Plan. The Residential Home Energy Assessment Program provided customers with opportunities to reduce their energy costs and increase their energy savings by offering a comprehensive home energy audit and providing energy saving solutions, installing energy saving measures, and encouraging customers to install high-efficiency HVAC, lighting equipment, and electric appliances. As part of the program UGI Electric paid for and installed six LEDs, two faucet aerators, one smart strip plug, water pipe insulation and water heater thermostat setback. As proposed in Phase II, the program was unsuccessful in achieving any meaningful participation. For example, in Program Year 5 only 12 customers participated, with a TRC of 0.02. After consulting with the parties to the Phase II EE&C, the parties agreed that UGI Electric could make temporary modifications to more effectively run the program through the end of Phase II. Ultimately without those modifications in place, the weatherization program would not be successful and the parties were unwilling to continue with the modifications. In addition, since Phase II, costs for weatherization have increased beyond the level of costs that were included in the Company's original program. Finally, limited contractor resources for weatherization are available in the Company's service territory, and this lack of

resources limits UGI Electric's ability to undertake a comprehensive weatherization program.

Q. Ms. Sherwood criticizes the Company's kits program on page 13 of her surrebuttal testimony on the basis that oversaturation is a concern. Please respond.

A. Over the life of the School Energy Kits program, UGI Electric has provided approximately 13,000 kits to students. With a total of approximately 55,000 residential customers, the market saturation of these kits is less than 25% of the Company's total residential customer base. It is clearly not true that the Company's use of energy kits has reached the point of oversaturation.

Q. Ms. Sherwood argues on page 14 that water saving measures included in the Company's kits are not appropriate because energy savings are a secondary benefit, with low in-service rates. Do you agree?

A. No, I do not agree with either of these points. First, I do not understand Ms. Sherwood's concerns that energy efficiency savings are a secondary benefit after water savings. Low-flow faucets provide both water savings and energy savings – a dual benefit to customers. The kit in the Energy Kit Program is projected to provide more than twice the electric benefits than the incremental cost of the kit. Second, these measures have the dual benefit of being both low in cost to the Company and easy to install for the customer, with no need for additional installation time or costs.

The in-service rates used for the Energy Kits program are based on default values from the Act 129 TRM. UGI Electric plans to evaluated in-service rates for the Energy Kits program and may well find in service rates higher than what is prescribed in the TRM as a default value due to program design considerations. Specifically, the Energy Kits program will require customers to request kits, and will only allow kits if the customers indicate that they use electricity for water heating, as explained on page 12 of my direct testimony (UGI Electric St. 1).

Q. Does Ms. Sherwood provide any analysis to support her conclusion that the in-service rates for these measures are low?

A. No, she does not.

Q. Does Ms. Sherwood provide any alternative energy savings equipment for inclusion in the kits?

A. No.

Q. Do other EDCs use kits with water savings measures?

A. Yes. In Pennsylvania, kits with water saving measures are offered by PPL and First Energy. Many of the leading energy efficiency portfolios in the region also offer kits with water saving measures, including Mass Save in Massachusetts, Efficiency Vermont, and Efficiency Maine.

Q. Ms. Sherwood quotes survey results included in the Company's program evaluation on page 11 and concludes that the energy kits program is not successful in educating customers about the existence of UGI Electric's website and other programs. Please respond to this assertion.

A. First, Ms. Sherwood misunderstands the survey process associated with the School Energy kits program. The surveys themselves are included with the School Energy kits and are taken home by students. They are completed at the time the kits are received. Therefore, if anything, these results show that many UGI Electric customers are not aware of the Company's website and programs at the time that the School Energy kit is obtained. The survey results do not, however, measure the post-kit experience of these households, and it does not measure whether customers visit the Company's website or participate in other EE&C programs after they are introduced to these programs via the School Energy kit.

Further, UGI Electric's Phase IV includes a new energy kits program that is specifically intended to drive customers to engage directly with the Company's website, its programs, and its educational content in order to receive a low-flow faucet. In this proceeding, Ms. Sherwood has consistently opposed a program that is designed to do the very customer outreach and education she seeks in her surrebuttal testimony.

Q. Ms. Sherwood recommends "that the Company shift funds from the Energy Kits Program to the Low-Income Program to allow for increased participation, either through an increased number of HPWH or an addition of measure(s)." (OCA St. 1SR, p. 15.) Do you agree?

A. No. I do not believe that the Energy Efficiency Kit program should be defunded. As I have stated previously, there are significant benefits for the inclusion of this program, including improvements to the overall EE&C Plan that Ms. Sherwood appears to be seeking. More critically, shifting the funding for this program to increase HPWH installations, or other heat pumps, will reduce the number of customers served by UGI Electric's portfolio due to the much higher cost per customer (the Energy Efficiency Kit program cost per customer is $40, the HPWH cost per customer is $3,500). Ms. Sherwood's proposal will also reduce low-cost ways in which UGI Electric's customers can participate in the Plan.

Q. Ms. Sherwood concludes her testimony by setting forth her "overarching concerns" about the Company's Plan. What do these include? (OCA St. 1SR, pp. 17-18.)

A. Ms. Sherwood identifies the following new concerns in this portion of her testimony that she did not raise elsewhere in her surrebuttal testimony:

(1) The Company focuses on programs with short measure lives rather than long-term savings;

(2) The Plan focuses too much on cost-effective programs and does not use cost-effective programs to offset less cost-effective programs;

(3) The Plan ignores best practices;

(4) The Company maintains the status quo; and

(5) The Company must design its EE&C Plan around the IRA and should market IRA benefits to its customers.

Q. Please address Ms. Sherwood's claim that the Company's plan focuses on programs with short measure lives.

A. This assertion is incorrect. UGI Electric offers many programs that have long-term measure lives, including programs encouraging the adoption of high efficiency equipment with 15 year life spans. The Company's Phase IV Plan offers a range of measures to reach as broad a range of customers as possible, from the energy kits and education efforts to major home repairs.

Q. Ms. Sherwood is concerned that the Company's program is overly focused on cost-effectiveness, to the exclusion of other programs that might benefit customers. Please respond.

A. The Company's program is, of course, focused on overall cost-effectiveness, because that is required by Act 129 and the Commission. However, contrary to Ms. Sherwood's claims, the Company does offer a range of programs that reflect different levels of cost-effectiveness, and does leverage very cost-effective programs, such as those offered to C&I customers, to provide less cost-effective programs, such as those targeting low-income customers.

Q. Ms. Sherwood states that UGI Electric's Plan ignores best practices. (OCA St. 1SR, p. 17.) Do you agree?

A. No, I do not. UGI Electric's EE&C Plan is similar to the EE&C plans of other Pennsylvania EDCs and has been updated and improved to leverage current program experience and reach additional customers.

Q. Ms. Sherwood's next concern is that the Company's Plan maintains the status quo. What is your response?

A. The Company's Phase IV Plan does continue many of the programs included in its earlier EE&C plans. However, it has also expanded programs, modified programs, and narrowed programs to reflect ongoing anticipated participation. It has also added new programs to target unmet needs, such as the new energy kits program and the programs targeting small businesses. There is no rational basis for discontinuing programs that are successful, cost-effective, and where there is still unmet demand for energy savings.

Q. Finally, Ms. Sherwood argues that UGI Electric's EE&C Plan must be designed around the federal funding made available through the IRA and that UGI Electric is responsible for marketing the IRA to its customers. Do you agree?

A. No, I do not. Ms. Sherwood does not explain with any specificity what changes UGI Electric should make or what portions of its programs must be changed to conform to the IRA. The IRA is more than 700 pages long. It is being implemented

at both the federal and the state level through numerous agencies. There are provisions relating to efficiency standards, to tax credits, and to income eligibility, amongst many other things. However, Ms. Sherwood has not identified any section, program, or specific element of the IRA for UGI Electric to address. Nor has she identified ways in which UGI Electric's Plan does not align with the IRA. Finally, unmentioned in her testimony is the fact that while the tax credits have gone into effect, many of the IRA's programs – and specifically those most likely to impact consumers in Pennsylvania – have not yet been implemented and will not be implemented for at least one more year.

Q. Do you have any final thoughts on the import of the IRA in this proceeding?

A. Yes. Act 129 was passed in 2008 and has been in effect in Pennsylvania for more than 15 years. UGI Electric has had a successful EE&C Plan for 12 years. Act 129 pre-existed the IRA by more than a decade. The regulations and policies surrounding Act 129 were fully formed and implemented long before the IRA was signed into law. Further, the objective of Act 129 – the reduction of electric use in Pennsylvania – does not align with the broad reaching objectives of the IRA. There is no reason to conclude that UGI Electric's EE&C Plan, seeking to accomplish the objectives of Act 129, should be designed only to fall within the parameters and to serve the objectives of the IRA. These are separate legislative mandates with separate goals and separate implementation and effectuation processes. It is common for Pennsylvania state actions and policies to differ from federal Congressional actions and policies. While the IRA and Act 129 may overlap, the

main programs that do so are not yet fully designed or approved. Forcing Act 129 Plans to fall within the scope of programs from the IRA that are not yet finalized will needlessly deprive customers of cost saving and energy efficiency benefits and would undermine the legislative intent and goals established by Act 129 for the state of Pennsylvania.

III. FURTHER MODIFICATIONS TO THE COMPANY'S PLAN

Q. In her rejoinder testimony, Ms. Sherwood continues to recommend that the Company file its evaluation of its programs at this docket. Do you have an update to your position on this recommendation?

A. Yes. In past phases of its EE&C Plan, UGI Electric relied on an evaluation Conservation Service Provider ("CSP") to conduct an evaluation of the effectiveness of its programs. UGI Electric will continue this practice of using a CSP to evaluate its Phase IV programs, and will file the results of its evaluation of the residential programs in PY 14 and non-residential programs in PY 15.

Q. Does the Company have any further modifications to its Plan regarding reporting?

A. Yes, it does. In past phases of its EE&C Plan, the Company has reported its results for the Commercial and Industrial ("C&I") Incentive Program on a gross and net basis. As part of this reporting, UGI Electric applied a Net-to-Gross ratio of 0.7 for the C&I Incentive Program. The Company has also tracked and evaluated actual project savings for the C&I Incentive Program's projects so that the Company is

able to determine estimated annual pre-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. As part of this analysis, the Company has used three methods to determine pre- and post-usage: raw usage comparison; baseload usage comparison; and adjusted usage comparison. The Company believes that it is appropriate to continue these reporting practices in Phase IV of its EE&C Plan.

Q. Are there modifications to its Phase III reporting practices that should be made?

A. Yes. The Company's annual EE&C Plan reports previously consolidated Class 2 and Class 3 customer program results. In Phase IV of its reporting, UGI Electric will segregate results for the C&I programs between the Class 2 and Class 3 customer rate class groups. During Phase IV, for each rate class group, the Company will present costs, savings and participation results for each of its proposed pathways, (*i.e.*, the Prescriptive, Custom Incentive and Direct Install pathways). For the Prescriptive pathway, the standard results will include the number of customers served, as well as the number of units. In addition, the Company will include the annual and Phase IV to-date incentive and non-incentive spending values on a per first year MWh basis for each rate class group of the C&I Incentive Program in its annual reports.

Q. Are there any other Phase III modifications that should be carried forward into the Company's Phase IV Plan?

A. Yes. In Phase III of its Plan, UGI Electric agreed to cost limits on the C&I Incentive Program that applied over the five-year term of the Phase III EE&C Plan. First, overall incentive spending was limited to $100 per first year MWh. Second, overall non-incentive spending was limited to $110 per first year MWh. In using these cost limits, UGI Electric's internal EE&C staff expenses were not assigned to the C&I Incentive Program and, therefore, were not included in the calculation of the annual non-incentive spending cost limit. These cost limits remain prudent and, therefore, should be applied to UGI Electric's Phase IV EE&C Plan.

Q. Does this conclude your rejoinder testimony?

A. Yes, it does. Thank you.

BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

PETITION OF UGI UTILITIES, INC. – ELECTRIC DIVISION
FOR APPROVAL OF PHASE IV OF ITS
ENERGY EFFICIENCY AND CONSERVATION PLAN

DOCKET NO. M-2023-_____

_____

TESTIMONY
OF
KIMBERLY M. BASSININSKY
_____

UGI ELECTRIC STATEMENT NO. 2

September 21, 2023

Q. Please state your name and business address.

A. My name is Kimberly M. Bassininsky, and my business address is UGI Utilities, Inc., 1 UGI Drive, Denver, Pennsylvania 17517.

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

A. I am employed by UGI Utilities, Inc. as a Principal Analyst – Rates.

Q. What is your educational background?

A. I have a Bachelor of Science Degree in Business Administration (Finance) from San Diego State University and a Master of Business Administration Degree from Alvernia University.

Q. Please describe your professional experience.

A. Prior to being hired by UGI Utilities, Inc. ("UGI"), I worked in financial analyst and finance business partner roles within the hospitality and service industries. I was hired in 2015 by UGI as a Senior Analyst Operations Analysis. Over the next five years, within the Financial Planning & Analysis department of UGI, I was promoted and worked in various positions supporting the financial analysis, forecasting, and budgeting functions for UGI with the last position being Manager Financial Planning & Analysis. In 2020, I accepted a Senior Analyst position within the Rates department of UGI. I have since been promoted and am currently a Principal Analyst Rates. I have supported and/or been responsible for various rate filings for both UGI Utilities, Inc. – Gas Division ("UGI Gas") and UGI Utilities, Inc. – Electric Division ("UGI Electric")

over the past three years. Currently, I am significantly involved and/or primarily responsible for the preparation of the following tariff filings and related computations:

- Annual 1307(f) Purchased Gas Cost ("PGC") filings on behalf of UGI Gas.
- Universal Service Program Rider, State Tax Adjustment Surcharge, Energy Efficiency and Conservation ("EEC") Rider, and Generation Supply Rate filings on behalf of UGI Electric.

Finally, I am primarily responsible for the development and preparation of the Purchased Gas Adjustment ("PGA") and Actual Cost Adjustment ("ACA") surcharge filings for UGI Gas's Maryland division, along with testifying in annual hearings concerning these charges before an administrative law judge at the Maryland Public Service Commission.

Q. Have you previously testified before the Pennsylvania Public Utility Commission ("Commission")?

A. Yes. I testified before the Commission in UGI Gas's PGC 1307(f) proceedings at Docket Nos. R-2021-3025652, R-2022-3032242, and R-2023-3040290. I also have testified before the Maryland Public Service Commission in UGI Gas's PGA hearings for the past two years at Case Numbers 9516(d) and 9516(e).

Q. What is the subject matter of your testimony in this proceeding?

A. I will describe how UGI Electric is proposing to recover the costs for developing and implementing its five-year Phase IV Energy Efficiency and Conservation Plan ("Phase

IV EE&C Plan" or "Plan"), which is being proposed to become effective, to the extent possible, on June 1, 2024, and last through May 31, 2029.

Q. Are you sponsoring any exhibits in this proceeding?

A. Yes. I am primarily responsible for and am sponsoring: (1) UGI Electric Exhibit 2, the pro forma tariff supplement for the Phase IV Energy Efficiency and Conservation Rider ("Phase IV EEC Rider"), which is attached to the Petition for Approval of the Phase IV EE&C Plan; (2) UGI Electric Exhibit KMB-1, which is attached to my testimony and shows the calculation of the proposed annual Phase IV EEC Rider; and (3) UGI Electric Exhibit KMB-2, which is attached to my testimony and is a copy of my curriculum vitae. In addition, as explained in the written direct testimony of Mr. Love (UGI Electric Statement No. 1), I am co-sponsoring UGI Electric's Phase IV EE&C Plan, which has been identified as UGI Electric Exhibit 1. Within UGI Electric Exhibit 1, I am primarily responsible for and sponsoring Section 5.

Q. What rate mechanism is UGI Electric proposing in connection with its Phase IV EE&C Plan?

A: UGI Electric proposes to utilize a separate rate mechanism to recover the budgeted costs for development and implementation of the Plan. Plan cost recovery will be accomplished utilizing the Phase IV EEC Rider.

I. <u>Projection of EE&C Plan Costs</u>

Q. What is UGI Electric's projection of the annual costs for its EE&C Plan?

A. The projected annual costs for the Company's EE&C Plan are approximately $2.1 million, which equates to a total budget of approximately $10.5 million over the five-year life of the Plan. This budget includes the Company's annual spending target on the Phase IV EE&C Plan programs and measures and also includes $349,000 per year (on average) to cover the Company's annual internal administrative costs incurred to implement and administer the Plan each year.

Q. How was the Company's spending target for the Phase IV EE&C Plan's programs and measures calculated?

A. Act 129 provides that the total costs of any EE&C Plan cannot exceed 2% of the Electric Distribution Company's ("EDC") total annual revenues as of December 31, 2006. *See* 66 Pa.C.S. § 2806.1(g). In its Phase I Implementation Order entered on January 16, 2009, at Docket No. M-2008-2069887 ("*Phase I Implementation Order*"), the Commission concluded that this limitation on the "total costs of any plan" should be interpreted as an annual amount, rather than an amount for the full term of the Plan. The Commission continued this level of cost recovery in its Phase II Implementation Order entered on August 3, 2012, at Docket Nos. M-2012-2289411 and M-2008-2069887 ("*Phase II Implementation Order*"), its Phase III Implementation Order entered on June 19, 2015, at Docket No. M-2014-2424864 ("*Phase III Implementation Order*"), and its Phase IV Implementation Order entered on June 18, 2020, at Docket No. M-2020-3015228 ("*Phase IV Implementation Order*"). In its December 23, 2009 Secretarial Letter issued at Docket No. M-2009-2142851 ("Secretarial Letter"), the Commission recognized that while the cost limits contained in Act 129 are not

applicable to a voluntary EE&C Plan, an EDC submitting such a plan must justify the level of expenditures using the 12-month period ending May 31, 2008.

UGI Electric has constructed its Phase IV EE&C Plan using the base period specified in the Secretarial Letter (i.e., June 1, 2007, through May 31, 2008). The jurisdictional revenues for this period were approximately $125.3 million. Based on this revenue level, the Company proposes an annual budget for expenditures on the Phase IV EE&C Plan programs and measures of approximately $2.1 million, which includes internal administrative costs of $349,000 per year on average associated with the design, development, and administration of the EE&C Plan. Specifically, the internal costs that comprise this amount include, among other things: (1) legal costs, consulting and regulatory costs associated with developing, submitting, and obtaining Commission approval of this Plan; (2) internal costs incurred to manage and administer the programs on an ongoing basis; and (3) internal costs to measure and verify program results.

Q. How is the budget allocated among the customer classes?

A. Of the $10.5 million total Phase IV budget, UGI Electric proposes to allocate approximately $5.9 million over the five years to the residential customer class and approximately $4.6 million over the five years to the non-residential customer class. These allocations of the total budget amount include an allocation of the internal administrative costs of $349,000 per year based on projected incentive spending by rate class. The projected administrative costs to be incurred over the five-year Phase IV EE&C Plan are summarized in Table 29 of the EE&C Plan. Those administrative costs

are allocated to the residential and non-residential customers based on projected incentive spending.

Q. How does the Company propose to treat the costs to design and develop the Company's Phase IV EE&C Plan?

A. The Commission provided in its *Phase I Implementation Order* that EDCs should be permitted to recover the incremental costs incurred to design, create, and obtain Commission approval of a plan. This practice was continued in the Commission's *Phase II Implementation Order*, *Phase III Implementation Order*, and *Phase IV Implementation Order*. The design and development costs associated with the Phase IV EE&C Plan are estimated to be $190,000 and are included within the $10.5 million spending target. The Company proposes to defer such development costs and to amortize and recover those deferred costs ratably over the 60-month life of its Phase IV EE&C Plan. As a result, the Company proposes to recover $38,000 during each year of the Plan for plan design and development.

Q. Did the Company propose a limit on annual expenditures for its Phase IV EE&C Plan programs?

A. Yes. UGI Electric has proposed an annual spending cap of $2.5 million, which represents 2% of annual revenues for the 12-month period ended May 31, 2008.

II. Cost Recovery

Q. Please describe the rate mechanism UGI Electric is proposing to use to recover the costs of its Phase IV EE&C Plan.

A. Act 129 requires EDCs to recover the costs of their EE&C Plans through a reconcilable adjustment clause under Section 1307 of the Public Utility Code. In its *Phase I Implementation Order*, the Commission reiterated this requirement and also directed that such cost recovery mechanisms be applicable to all electric customers and not affect the EDC's price-to-compare, provided the EDC's plan benefits both shopping and non-shopping customers. The Commission continued these requirements for cost recovery and directed EDCs to implement a separate 1307 mechanism to recover Phase II EE&C Plan costs in its *Phase II Implementation Order*. Further, in the *Phase III Implementation Order*, the Commission directed that: (1) the "annual cost recovery methodology" must be "based on the projected program costs that the EDC anticipates will be incurred over the surcharge application year to attain the energy reduction targets"; and (2) every EDC must "annually reconcile (*i.e.*, 1307(e) Statement) actual expenses incurred with actual revenues received for the reconciliation period." *Phase III Implementation Order*, p. 149. The Commission set forth the same requirement in its *Phase IV Implementation Order*. *See Phase IV Implementation Order*, p. 142.

Based on this Act 129 requirement and the Commission's Orders, UGI Electric proposes to recover the costs of its Phase IV EE&C Plan through the reconcilable Phase IV EEC Rider that will be imposed pursuant to Section 1307 of the Public Utility Code. As in Phases I, II, and III, the Company has designed its cost recovery mechanism to be applicable to default service and choice customers because UGI Electric's Phase IV

EE&C Plan will benefit both shopping and non-shopping customers. In this regard, UGI Electric proposes that, as with Phases I, II, and III, the cost recovery mechanism be included in the distribution charges for each customer class rather than appear as a separate line item on customers' bills. The pro forma tariff supplement to implement the Phase IV EEC Rider, which would become effective on one (1) day's notice, is attached to UGI Electric's Petition for Approval of the Phase IV EE&C Plan as UGI Electric Exhibit 2. The tariff language provides a description of the cost recovery method, the formula for calculating the charge, and the charges specific to each rate class. Attached to my testimony is Exhibit KMB-1, which shows the calculation of the proposed annual Phase IV EEC Rider.

Q. How many customer classes will be reflected in its annual cost recovery mechanism?

A. As in Phases I, II, and III, the Company proposes to calculate separately the applicable Phase IV EE&C Plan costs for three (3) general customer classes on its system: (1) residential; (2) non-residential customers (other than Rate Schedules LP and HTP), which include small and large commercial and industrial ("C&I") customers, and (3) Rate Schedule LP and HTP. The residential class includes low-income customers and customers served under Rate Schedules R, GS-5 and the residential portion of Rate Schedules OL, SOL, MHOL, or successor rate schedules. The non-residential class includes all other Company rate schedules not listed in the preceding sentence other than Rate Schedules LP and HTP.

Q. What is UGI Electric's overall approach for determining which customer class is responsible to pay for the programs in the Phase IV EE&C Plan?

A. As stated previously, my understanding is that Act 129 and the Commission require that the EE&C Plan programs approved by the Commission be supported by the same customer classes that will receive the direct energy and conservation benefits. As a result, under the Company's Plan, the costs of Phase IV EE&C Plan programs that target specific rate classes are directly assigned to those classes for purposes of developing the recovery charge.

Q. What is the recovery period, and when will it begin and expire?

A. The Company proposes that the Phase IV EEC Rider become effective, to the extent possible, on June 1, 2024. If that is not possible, the Company proposes that the Phase IV EEC Rider become effective on the date of the first quarterly default service rate filing following Commission approval of the Plan. As in Phases I, II, and III, the Company proposes that the Phase IV EEC Rider apply to all usage on and after that date, through and until the last day of the respective month in Plan Year Five. As stated above, UGI Electric is proposing a five-year period for this Plan. However, since Plan Year Five may result in over or under collections of expenses, the rate recovery mechanism must continue for a one-year period following the end of the Plan ("Final Reconciliation Year"), as in Phase I, II, and III, so that the Company may fully recover any under collection or refund any over collection incurred during Year Five. If it is known that there will be a Phase V EE&C Plan at the end of the Final Reconciliation Year related to Phase IV, any remaining balance will be recovered/refunded through

the Phase V EEC Rider's E-Factor. If there will be no Phase V 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/debit issued to the applicable customers during the second full billing month following the end of the Final Reconciliation Year. The annual reconciliation and end-of-Plan reconciliation will be subject to Commission review and potential audit, as the Commission deems necessary.

Q. Will the Company file for reconciliation each year?

A. As in Phases I, II and III, the Company proposes to adjust the Phase IV EEC Rider for actual program expenses and revenues each year. Each year, the Company will submit a filing to become effective on 30 days' notice to reconcile the previous period's revenues and expenses and adjust the Phase IV EEC Rider. In addition, as in Phases I, II, and III, the Company reserves the right to make an interim filing (to become effective on 60 days' notice) to adjust the Phase IV EEC Rider if it becomes evident that the over or under recovery is significantly deviating from expected activity. The net over or under collections will be based on the difference between the actual Phase IV EEC Rider revenues received and the actual Phase IV EE&C Plan costs incurred. The over or under collection calculation for each year of the Phase IV EE&C Plan will include the actual over or under collections for the period where the data is known.

Q. Does this conclude your Direct Testimony?

A. Yes, although I reserve the right to submit supplemental testimony if other issues arise during the course of the proceeding.

UGI Utilities, Inc. - Electric Division
Phase IV Energy Efficiency and Conservation Plan
Development and Impact of Energy Efficiency and Conservation Rate
"Phase IV EEC Rider"

Class 1 - Residential

Plan Year		**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**
Program Cost - Residential[1]		$1,143,544	$1,203,959	$1,206,100	$1,144,255	$1,157,934
Declining Projected Residential Usage (kWh)		609,633,763	607,142,986	604,529,630	601,832,595	599,051,881
EEC Rate (¢/kWh)[2]		0.199	0.211	0.212	0.202	0.205
Current Residential Rate (¢/kWh):	**Base Rate[3]**					
500 kWh Monthly Use	18.336	18.535	18.547	18.548	18.538	18.541
1,000 kWh Monthly Use	17.358	17.557	17.569	17.570	17.560	17.563
1,500 kWh Monthly Use	17.035	17.234	17.246	17.247	17.237	17.240
Cumulative Rate Impact:						
500 kWh Monthly Use		1.09%	1.15%	1.16%	1.10%	1.12%
1,000 kWh Monthly Use		1.15%	1.22%	1.22%	1.16%	1.18%
1,500 kWh Monthly Use		1.17%	1.24%	1.24%	1.19%	1.20%
Average EEC charge per Monthly Residential Bill		$1.70	$1.79	$1.80	$1.70	$1.72

Class 2 - Non-Residential (All non-residential rates plans excluding LP and HTP)

Plan Year		**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**
Program Cost - Class 2[1]		$480,395	$655,085	$821,428	$773,929	$772,775
Declining Projected Class 2 Usage (kWh)		153,057,245	150,689,844	147,616,622	144,543,401	141,470,179
Class 2 EEC Rate (¢/kWh)2		0.334	0.462	0.591	0.569	0.580
Current Class 2 Rate (¢/kWh):	**Base Rate[3]**					
5 kW Demand 1,000 kWh Monthly Use	17.924	18.258	18.386	18.515	18.493	18.504
25 kW Demand 10,000 kWh Monthly Use	14.633	14.967	15.095	15.224	15.202	15.213
Cumulative Rate Impact:						
5 kW Demand 1,000 kWh Monthly Use		1.86%	2.58%	3.30%	3.17%	3.24%
25 kW Demand 10,000 kWh Monthly Use		2.28%	3.16%	4.04%	3.89%	3.96%
Average EEC charge per Monthly Class 2 Bill		$4.69	$6.40	$8.02	$7.56	$7.55

Class 3 - Non-Residential (Rate Schedules LP and HTP)

Plan Year		**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**
Program Cost - Class 3[1]		$203,992	$243,364	$230,978	$217,622	$217,297
Declining Projected Class 3 Usage (kWh)		288,116,601	286,758,946	285,401,292	284,043,637	282,685,982
Class 3 EEC Rate (¢/kWh)[2]		0.075	0.090	0.086	0.081	0.082
Current Class 3 Rate (¢/kWh):	**Base Rate[3]**					
500 kW Demand 200,000 kWh Monthly Use	11.532	11.607	11.622	11.618	11.613	11.614
Cumulative Rate Impact:						
500 kW Demand 200,000 kWh Monthly Use		0.65%	0.78%	0.75%	0.70%	0.71%
Average EEC charge per Monthly Class 3 Bill		$80.57	$96.12	$91.22	$85.95	$85.82

Footnotes:
[1] Administrative costs, including the costs associated with the preparation and obtaining Commission approval of the EEC Plan, are allocated between EEC classes based on projected incentive spending.
[2] Includes 5.9% applicable to Gross Receipts Tax.
[3] Total rate as of July 1, 2023.

KIMBERLY M. BASSININSKY

PRINCIPAL ANALYST RATES

Work Experience

2022 – Present	Principal Analyst Rates (UGI Utilities, Inc., Denver, Pa)
2020 – 2022	Senior Analyst Rates (UGI Utilities, Inc., Denver, Pa)
2019 – 2020	Manager Financial Planning & Analysis (UGI Utilities, Inc., Denver, Pa)
2018 – 2019	Principal Financial Planning & Analysis Leader (UGI Utilities, Inc., Denver, Pa)
2017 – 2018	Senior Supervisor Financial Planning & Analysis (UGI Utilities, Inc., Reading, Pa)
2016 – 2017	Senior Supervisor Operations Analysis (UGI Utilities, Inc., Reading, Pa)
2015 – 2016	Senior Analyst Operations Analysis (UGI Utilities, Inc., Reading, Pa)
2013 – 2015	Finance Business Partner – Sales & Marketing (Rentokil North America, Reading, Pa)
2005 – 2013	Senior Financial Analyst – Marketing (Garden Fresh Restaurant Corp., San Diego, Ca)
2003 – 2005	Financial Analyst II (Garden Fresh Restaurant Corp., San Diego, Ca)
1999 – 2003	Financial Analyst I (Garden Fresh Restaurant Corp., San Diego, Ca)

Education

MBA, Alvernia University, Reading, Pa.

BS, Business Administration (Finance), San Diego State University, San Diego, Ca.

Previous Testimony

UGI 2023 1307(f) Proceeding	Docket No. R-2023-3040290
UGI 2022 1307(f) Proceeding	Docket No. R-2022-3032242
UGI 2022 Commodity and Purchased Gas Proceeding	MD PSC Case No. 9516(e)
UGI 2021 1307(f) Proceeding	Docket No. R-2021-3025652
UGI 2021 Commodity and Purchased Gas Proceeding	MD PSC Case No. 9516(d)

Assisted in Preparing

UGI 2023 Electric Base Rate Case:	Docket No. R-2022-3037368
UGI 2022 Gas Base Rate Case:	Docket No. R-2021-3030218
UGI 2021 Electric Base Rate Case:	Docket No. R-2021-3023618
UGI 2020 Gas Base Rate Case:	Docket No. R-2019-3015162
UGI 2019 Gas Base Rate Case:	Docket No. R-2018-3006814
UGI 2017 Gas Base Rate Case (the former North Rate District):	Docket No. R-2016-2580030

BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

PETITION OF UGI UTILITIES, INC. – ELECTRIC DIVISION
FOR APPROVAL OF PHASE IV OF ITS
ENERGY EFFICIENCY AND CONSERVATION PLAN

DOCKET NO. M-2023-3043230

REBUTTAL TESTIMONY
OF
KIMBERLY M. BASSININSKY

UGI ELECTRIC STATEMENT NO. 2-R

December 22, 2023

I. INTRODUCTION

Q. Please state your full name, occupation, and business address.

A. My name is Kimberly M. Bassininsky, and I am a Principal Analyst – Rates with UGI Utilities, Inc. ("UGI"). My business address is 1 UGI Drive, Denver, Pennsylvania 17517.

Q. Did you previously submit testimony in this proceeding on behalf of UGI Utilities, Inc. – Electric Division ("UGI Electric" or the "Company")?

A. Yes. I submitted my direct testimony, UGI Electric Statement No. 2, on September 21, 2023.

Q. Would you please describe the purpose of your rebuttal testimony in this proceeding?

A. My rebuttal testimony responds to portions of the direct testimony submitted by Robert D. Knecht on behalf of the Office of Small Business Advocate ("OSBA"), OSBA Statement No. 1, concerning UGI Electric's proposed Phase IV Energy Efficiency and Conservation ("EE&C") Plan.

Q. Are you sponsoring any exhibits with your rebuttal testimony?

A. Yes. I am sponsoring UGI Electric Exhibit KMB-1R.

II. RESPONSE TO OSBA

Q. After reviewing Mr. Knecht's testimony and recommendations, has the Company proposed any modifications to its programs?

A. Yes, it has. The Company considered the OSBA's recommendations and has included modifications to Class 2 as described in the rebuttal testimony of Mr. Theo Love, UGI Electric Statement No. 1-R. The effect of these changes lowers the cost of the EE&C programs that will ultimately be borne by Class 2 customers. As a result of these changes, I have updated my analysis showing the Class Rates and Cumulative Rate Impacts for the Company's proposed Phase IV EE&C Plan. My updated analysis is included with this testimony as UGI Electric Exhibit KMB-1R.

Q. Please describe the changes reflected in UGI Electric Exhibit KMB-1R.

A. There are two main drivers of the changes reflected in UGI Electric Exhibit KMB-1R. The first of these changes impacts all of the rates reflected when compared to the exhibit submitted with my direct testimony. Specifically, two updates are being made to the calculations. The first is to remove the erroneous duplication of the EE&C charge within the calculation.[1] In addition, since the filing of my direct testimony UGI Electric implemented base rate changes approved in Docket No. R-2022-3037368 (Order entered September 21, 2023). The new base rates were made effective October 1, 2023. UGI Electric Exhibit KMB-1R incorporates these currently effective rates. Making these changes impacted the Class Rates and resulted in revised Cumulative Rate Impacts. In

[1] The Class Rates shown on the original UGI Electric Exhibit KMB-1 were calculated by taking the effective Base Rate at the time of filing and adding the calculated EEC Rates for each of the years of the plan (i.e., Years 1 through 5). However, the Base Rate already included the EEC Rider Rate as of July 1, 2023. As a result, the EEC Rider Rate was improperly included twice, overstating the impact of the proposed Phase IV EE&C Plan.

addition, UGI Electric Exhibit KMB-1R reflects all the changes as described in the rebuttal testimony of Mr. Theo Love, UGI Electric Statement No. 1-R. Ultimately, these changes have resulted in lower Class 2 Rates and Cumulative Rate Impacts for those customers.

Q. Please describe how these changes have impacted the Company's proposed rates.

A. The above described changes resulted in slight rate increases for Class 1 and Class 3 customers and a significant rate decrease for Class 2 customers. Further, based on the revised program costs, a Class 2 customer with a 5kW Demand and 1,000 kWh monthly use would have a total rate change of (0.2%) in Year 1, 0.2% in Year 2, 0.1% in Year 3, 0.0% in Year 4, and 0.0% in Year 5. A Class 2 customer with a 25kW Demand and 10,000 kWh monthly use would have a total rate change of (0.2%) in Year 1, 0.2% in Year 2, 0.1% in Year 3, (0.1%) in Year 4, and 0.0% in Year 5.

Q. Looking more specifically at Mr. Knecht's testimony, on page 16 of his direct testimony, Mr. Knecht asserts that the proposed charge for Class 2 is significantly higher than the highest EE&C charge UGI Electric has previously imposed since mid-2015. How does the revised charge compare to prior UGI Electric EE&C charges?

A. The rate referenced by Mr. Knecht in his testimony, of 0.266 cents per kWh (for Class 3), was the EEC Net Revenue reported by UGI Electric as part of its EE&C Phase III Revenue and Expense Reconciliation and excluded GRT. The EE&C rates presented in my exhibit are inclusive of GRT. Therefore, the highest prior EE&C rate for Class 3 with GRT was 0.283 cents per kWh. Although slightly lower, the highest prior EE&C rate for Class 2 with GRT was 0.224 cents per kWh. As revised, UGI Electric's highest proposed Class 2

rate is 0.154 cents per kWh. This rate is comparable to UGI Electric's past EE&C rates. Further, any increase ultimately borne by Class 2 customers is due to additional functionality and actual use by this same group of customers.

Q. On page 16 of his direct testimony, as shown in Table RDK-4, Mr. Knecht compares the charge for UGI Electric's highest plan year to other Pennsylvania EDCs, and concludes that UGI Electric's overall program cost is higher than other EDCs. How does the revised proposed rate compare with other EDCs?

A. First, I would note that the data presented by Mr. Knecht in Table RDK-4 compares current EE&C rates at other Pennsylvania EDCs, which include prior year over and under impacts, with rate projections for UGI Electric. Specifically, he uses Plan Years 13 and 15 for the Company, which are one and three years in the future. It would have been more appropriate to compare the Company's proposed rates with similar rate projections for the other EDCs. However, using the data presented in Table RDK-4 for the other EDCs, the Company's revised rates for Plan Years 13 and 15 are comparable to other current EE&C rates. The rates in Table RDK- 4 for the other Pennsylvania EDCs range from 0.129 to 0.510 cents per kWh. With the revisions, UGI Electric's highest proposed rate of 0.154 cents per kWh in Plan Year 15 is at the lower end of the range of the current rates provided by Mr. Knecht.

Q. On page 17 of his direct testimony, Mr. Knecht argues that UGI Electric's proposed increase for Class 2 is unreasonable and excessive, and he recommends a maximum rate of 0.35 cents per kWh. Please respond.

A. After considering OSBA's recommendations, UGI Electric has adjusted its Class 2

projections, which lowers the charges for Class 2 customers. The proposed maximum charge in the revised programs is 0.154 cents per kWh. This proposed rate is only approximately 44% of the maximum rate of 0.35 cents per kWh as proposed by Mr. Knecht.

Q. Do you have any final comments on the Class 2 EE&C rates proposed in this proceeding?

A. Yes. Consistent with Act 129, the EEC Rider is calculated based on projected annual program costs and participation and includes an annual reconciliation. The proposed Phase IV EE&C Plan contains changes to make it easier for Class 2 (Small C&I) to participate in the EE&C program. As a result, the Company anticipates greater participation by Class 2 customers and therefore greater program costs associated with those customers. The projected rates for Class 2 customers reflect this increase in Class 2 costs, consistent with cost causation principles. Furthermore, the year over year total rate change for each of the five years of the plan is small. The Company's proposal strikes the appropriate balance of increasing program participation and the associated benefits to Class 2 customers, while appropriately managing the rate impacts on this customer group.

Q. Does this conclude your rebuttal testimony?

A. Yes.

UGI Electric Exhibit KMB-1R

UGI Utilities, Inc. - Electric Division
Phase IV Energy Efficiency and Conservation Plan
Development and Impact of Energy Efficiency and Conservation Rate
"Phase IV EEC Rider"

Class 1 - Residential

Plan Year		Year 1	Year 2	Year 3	Year 4	Year 5
Program Cost - Residential[1]		$1,184,735	$1,275,464	$1,294,669	$1,204,599	$1,217,860
Declining Projected Residential Usage (kWh)		609,633,763	607,142,986	604,529,630	601,832,595	599,051,881
EEC Rate (¢/kWh)[2]		0.207	0.223	0.228	0.213	0.216
Current Residential Rate (¢/kWh):	Base Rate[3]					
500 kWh Monthly Use	20.718	20.866	20.882	20.887	20.872	20.875
1,000 kWh Monthly Use	19.641	19.789	19.805	19.810	19.795	19.798
1,500 kWh Monthly Use	19.283	19.431	19.447	19.452	19.437	19.440
Cumulative Rate Impact:						
500 kWh Monthly Use		0.71%	0.79%	0.82%	0.74%	0.76%
1,000 kWh Monthly Use		0.75%	0.83%	0.86%	0.78%	0.80%
1,500 kWh Monthly Use		0.77%	0.85%	0.88%	0.80%	0.81%
Average EEC charge per Monthly Residential Bill		$1.76	$1.90	$1.93	$1.79	$1.81

Class 2 - Non-Residential (All non-residential rates plans excluding LP and HTP)

Plan Year		Year 1	Year 2	Year 3	Year 4	Year 5
Program Cost - Class 2[1]		$146,673	$195,632	$221,147	$206,947	$206,485
Declining Projected Class 2 Usage (kWh)		154,206,523	153,480,098	152,681,310	151,882,523	151,083,735
Class 2 EEC Rate (¢/kWh)2		0.101	0.135	0.154	0.145	0.145
Current Class 2 Rate (¢/kWh):	Base Rate[3]					
5 kW Demand 1,000 kWh Monthly Use	19.921	19.890	19.924	19.943	19.934	19.934
25 kW Demand 10,000 kWh Monthly Use	16.148	16.117	16.151	16.170	16.161	16.161
Cumulative Rate Impact:						
5 kW Demand 1,000 kWh Monthly Use		-0.16%	0.02%	0.11%	0.07%	0.07%
25 kW Demand 10,000 kWh Monthly Use		-0.19%	0.02%	0.14%	0.08%	0.08%
Average EEC charge per Monthly Class 2 Bill		$1.43	$1.91	$2.16	$2.02	$2.02

Class 3 - Non-Residential (Rate Schedules LP and HTP)

Plan Year		Year 1	Year 2	Year 3	Year 4	Year 5
Program Cost - Class 3[1]		$232,609	$286,895	$287,008	$268,579	$267,979
Declining Projected Class 3 Usage (kWh)		288,116,601	286,758,946	285,401,292	284,043,637	282,685,982
Class 3 EEC Rate (¢/kWh)[2]		0.086	0.106	0.107	0.100	0.101
Current Class 3 Rate (¢/kWh):	Base Rate[3]					
500 kW Demand 200,000 kWh Monthly Use	11.701	11.584	11.604	11.605	11.598	11.599
Cumulative Rate Impact:						
500 kW Demand 200,000 kWh Monthly Use		-1.00%	-0.83%	-0.82%	-0.88%	-0.87%
Average EEC charge per Monthly Class 3 Bill		$91.87	$113.31	$113.35	$106.07	$105.84

Footnotes:

[1] ***Administrative costs, including the costs associated with the preparation and obtaining Commission approval of the EEC Plan, are allocated between EEC classes based on projected incentive spending.***

[2] ***Includes 5.9% applicable to Gross Receipts Tax.***

[3] ***Total rate as of October 1, 2023.***

COMMONWEALTH OF PENNSYLVANIA

December 1, 2023

The Honorable Mark A. Hoyer
Administrative Law Judge
Pennsylvania Public Utility Commission
301 5th Avenue, Suite 220
Pittsburgh, PA 15222

Re: Petition of UGI Utilities, Inc. – Electric Division for Approval of Phase IV of its Energy Efficiency and Conservation Plan / Docket No. M-2023-3043230

Dear Judge Hoyer:

Enclosed please find the Direct Testimony and Exhibits of Robert D. Knecht, labelled OSBA Statement No. 1, with Exhibits RDK-1, RDK-2, and RDK-3, on behalf of the Office of Small Business Advocate ("OSBA"), in the above-captioned proceeding.

As evidenced by the enclosed Certificate of Service, all known parties will be served, as indicated.

If you have any questions, please do not hesitate to contact me.

Sincerely,

/s/ Steven C. Gray

Steven C. Gray
Senior Supervising
Assistant Small Business Advocate
Attorney ID No. 77538

Enclosures
cc: PA PUC Secretary Rosemary Chiavetta (Cover Letter & Certificate of Service only)
Robert D. Knecht
Parties of Record

OSBA Statement No. 1

BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

Petition of UGI Utilities Inc. – Electric Division for Approval of Phase IV of its Energy Efficiency And Conservation Plan	:	**Docket No. M-2023-3043230**

Direct Testimony and Exhibits of

ROBERT D. KNECHT

On Behalf of the

Pennsylvania Office of Small Business Advocate

Topics:

Phase IV EE&C Plan

Date Served: December 1, 2023

Date Submitted for the Record: _____

DIRECT TESTIMONY OF ROBERT D. KNECHT

1. Introduction

Q. Mr. Knecht, please state your name and briefly describe your qualifications.

A. My name is Robert D. Knecht. I am an independent consultant, focusing on analysis and expert testimony in the field of regulatory economics on a variety of topics. I obtained a B.S. degree in Economics from the Massachusetts Institute of Technology in 1978, and a M.S. degree in Management from the Sloan School of Management at M.I.T. in 1982, with concentrations in applied economics and finance. For more than 30 years, I was a Principal of the firm Industrial Economics, Incorporated ("IEc").

I am appearing in this proceeding on behalf of the Pennsylvania Office of Small Business Advocate ("OSBA"), under a contract between OSBA and IEc. My résumé and a listing of the expert testimony that I have filed in utility regulatory proceedings during the past five years are attached in Exhibit RDK-1. Interrogatory responses referenced in this testimony are attached in Exhibit RDK-2. My electronic workpapers are submitted with this testimony, listed in Exhibit RDK-3.

Q. Please describe your assignment in this matter.

A. OSBA requested that I review (a) the economic performance of Phase III of the Energy Efficiency and Conservation Plan ("EE&C Plan") operated by UGI Utilities, Inc. – Electric Division ("UGI Electric" or "the Company"), and (b) the Company's proposals for Phase IV of its EE&C Plan, as they both relate to commercial and industrial ("C&I") customers.[1] In so doing, I have relied both on my testimony at Docket No. M-2018-3004144 and updated analysis.[2]

Q. Please summarize the impacts of the Company's proposed EE&C Plan on small business customers.

[1] Phase III is designated as the five years PY 8 through 12, based on plan years ending May 2020-2024. Phase IV will begin June 2024, extending five years through May 2029 (PYs 13-17).

[2] By way of full disclosure, this testimony includes some text copied directly from my earlier testimony, where it was appropriate.

A. The Company's EE&C Plan segregates revenues and costs for Small C&I customers, primarily in rate classes GS-1 and G-4 ("Class 2"), and "Large C&I" customers in rate class LP ("Class 3").[3] For Phase III, the Company's EE&C Plan for C&I customers consisted solely of a "Custom" program, which applied to both Small C&I and Large C&I customer groups. In the Custom program, a variety of energy efficiency improvements are provided to customers through individual projects that are specific to the customer. In Phase III, this approach has generally resulted in a relatively small number of projects for larger customers, with Large C&I accounting for 87 percent of the overall C&I MWh savings and 79 percent of utility costs.[4]

For Phase III, the Company plans to overhaul the C&I program offerings, with the intent of providing more benefits to smaller C&I customers. It proposes to substantially reduce the Custom program, and to implement two new pathways, namely a Prescriptive program and a Direct Install program. The new programs have features that would make it simpler and more economically attractive for smaller customers to take advantage of the EE&C program largesse. Nevertheless, the number of smaller C&I customers who would benefit from the EE&C Plan remain a tiny fraction of all C&I customers.

These changes serve to substantially shift plan spending from Large C&I to Small C&I customers, and they would result in a more than five-fold increase in the EE&C charge for Small C&I customers.

Q. How is your testimony organized?

A. Section 2 provides a background on the key economic features of the Company's EE&C plans, and reviews various aspects of EE&C Plan performance in Phase III. Section 3 reviews the proposed changes to the EE&C Plan in Phase IV for C&I customers. Section 4 summarizes my recommendations.

[3] Class 3 also covers Rate HTP, but there are currently no customers in that class.

[4] UGI Electric has approximately 7,500 customers in rate classes GS-1 and GS-4, and it provided 66 Custom projects to Class 2 customers in Phase III to date (PYs 8-11), less than 1 percent participation. By contrast, the Company has only about 215 LP customers, but offered 37 Custom programs (over 17 percent). See RDK WP1.

2. Background

Q. Before getting into the substance of your review, please restate your testimony from the Phase III proceeding regarding the background economics for utility-sponsored EE&C plans, as they apply to Pennsylvania in general and UGI Electric in particular.

A. Utility-sponsored EE&C programs have a goal of reducing energy consumption and peak demands on the utility system.[5] Some of those savings are achieved through customer education efforts, wherein customers are shown how they can reduce their utility bills through energy conservation efforts. However, the vast majority of programs within utility EE&C plans involve providing "incentives" to participating customers to induce them to adopt energy saving technologies or practices. The incentives, of course, are not provided by utility shareholders, but are funded from rates paid by all ratepayers. EE&C plans also involve costs for conservation service providers ("CSPs"), administration, marketing, and evaluation/measurement/verification ("EM&V"), all of which are also passed on to ratepayers.

In their early incarnations, EE&C plans (often called demand-side management or "DSM" programs) were typically designed as "win-win" programs, in which the net impact on both participants and non-participants was positive. This result was possible because the incremental cost for utility supply was higher than the average cost utility rates, and it was more cost-effective for a utility to subsidize conservation than to construct new capacity. Assessing whether an EE&C program is "win-win" is still reflected in the "Ratepayer Impact Measure" ("RIM") Test for EE&C programs, although most jurisdictions (including Pennsylvania) do not rely on that test.

Over time, however, the economic evaluation of EE&C programs evolved in a couple of ways. First, EE&C programs began to consider economic benefits associated with "externalities" that were not reflected in utility rates and costs, most notably environmental impacts associated with fossil fuel combustion, including SO_2, NO_x, particulate, and CO_2 emissions. Second, rate impact concerns diminished. The economic tests applied to EE&C

[5] EE&C programs can also be focused on reduction of overall primary energy consumption, with the result being increases in some utility services. For example, fuel-switching and CHP projects may reduce overall energy consumption, but increase natural gas deliveries.

programs began focusing more on overall economic or socio-economic efficiency, and concerns about subsidies from non-participants to participants were increasingly ignored.[6] This change gave rise to the use of economic tests like the Total Resource Cost ("TRC") Test, wherein overall costs are compared to overall benefits, but little or no consideration is given to inequitable economic transfers from non-participants to participants.[7]

In 2008, Pennsylvania adopted Act 129 which generally mandated that the larger EDCs adopt EE&C plans. Act 129 mandated the use of the TRC Test to evaluate the overall economics of the plan, and it provided for timely utility recovery of direct costs associated with the program (generally incentives and program administration). However, recovery of lost revenues associated with load reductions due to the EE&C programs was limited to future base rates proceedings. Thus, the basic economic framework in Pennsylvania certainly recognizes that cross-subsidization is a part of these programs. Rates for non-participating customers are negatively impacted in two stages: first by the EE&C charges designed to recover direct costs and second by the higher base rates to reflect reduced load.[8]

However, the Pennsylvania legislation includes provisions designed to encourage the larger EDCs to be efficient with their use of ratepayer funds, and to limit cross-subsidies to those necessary to induce customer participation. Specifically, the legislation established targets for energy savings, it put limits on direct utility costs recoverable in rates, and it imposed economic penalties for failure to meet the energy savings targets. Because the budgets are capped and penalties apply, the larger EDCs have a strong incentive to focus on the EE&C programs that can be achieved with low direct utility costs,

[6] In economics jargon, the use of "Pareto Efficiency" as the guideline for EE&C programs was replaced with the use of "Kaldor-Hicks Efficiency." In theory, a Kaldor-Hicks efficient program could become Pareto efficient, if the winners compensate the losers. In practice, however, that would require program beneficiaries to refund all subsidies received, pay for the cost of the EE&C programs, and pay for the lost distribution revenue.

[7] To old cost allocation practitioners (like me), this mandatory cross-subsidization flies in the face of the dogma that cost causation should be the basis for utility cost allocation and rate design.

[8] In general, the Commission has determined that the avoided transmission and distribution costs are lower than base rates, and therefore the net effect of EE&C savings is negative.

and to administer the programs at as low a cost as possible. Since the cross-subsidies are included in utility costs, the larger EDCs have an incentive to keep those incentives low.

One downside to the general Pennsylvania approach is that utilities have an incentive to try to *claim* that energy efficiency savings have been achieved (to avoid the penalties) but not to actually experience any load reductions (to avoid lost base rate distribution revenue). Most other stakeholders in the process, notably EE&C program consultants who design these programs, conservation service providers who operate the program, vendors who provide EE&C technology, and EM&V practitioners have at least some economic incentive to demonstrate that these programs are economically efficient. These incentives may contribute to some of the academic evidence that raises concerns that actual energy savings fall short of the energy savings calculated for these plans.[9]

UGI Electric, however, is not subject to the requirements of Act 129, and is not required by statute to adopt an EE&C plan. It has, however, adopted a "voluntary" plan, which is most of the way through its third phase.[10] Because this plan is not subject to the strictures of Act 129, notably the target savings levels and the penalties for non-performance, the Company's incentives for economic efficiency are less strong than those that apply to the larger Pennsylvania EDCs. In particular:

- UGI Electric has less incentive to focus on the energy savings that can be achieved at lowest direct utility cost;

- UGI Electric has less incentive to minimize plan administration costs;

[9] See, for example, "Do Energy Efficiency Investments Deliver? Evidence from the Weather Assistance Program," Fowlie, Greenstone and Wolfram, NBER Working Paper, July 2015, http://www.nber.org/papers/w21331.pdf and "Advances in Evaluating Energy Efficiency Policies and Programs," Gillingham, Keyes and Palmer, RFF Working Paper, November 2017 http://www.rff.org/files/document/file/RFF%20WP%2017-21-REV.pdf.

[10] Phase I was originally intended to be a three-year plan from June 2012 to May 2015, but it was extended for a year. Phase II was originally intended to run from June 2015 to May 2018, but was also extended for a year. Phase III began in June 2019, and continues for five years through May 2024.

- UGI Electric has less incentive to try to keep incentive payments down to the minimum level necessary to induce customer participation.

Thus, compared to other Pennsylvania EDCs, the UGI Electric EE&C program should be subject to additional regulatory scrutiny to ensure that costs are prudently incurred.

Q. In addition to these concerns, did you raise any other general issues regarding the Company's EE&C programs in the Phase III proceeding?

A. I observed that the administrative costs for the UGI Electric EE&C programs per MWh saved were materially higher than those for other Pennsylvania EDCs, presumably due to the diseconomies of scale for a small utility.

Q. Re the foregoing, you raised all these issues in the Phase III proceeding. How were they addressed?

A. In the settlement at Docket M-2018-3004144, the Company agreed to the following:

- To address concerns about incentives for cost control, the Company agreed to limit establish limits on spending within the C&I programs such that average incentive payments would not exceed $100 per MWh of first-year savings.

- To address concerns about administrative costs, the Company agreed that average administrative costs (exclusive of portfolio-wide costs) would not exceed $110 per MWh. While this value was generally higher than that at other EDCs, it provides at least some incentive to the Company to control costs.

- To address concerns regarding whether actual C&I load reductions for individual customers were similar to those forecast at the implementation of the Custom program, the Company agreed to track forecast and actual loads by participating customer.

Q. Please provide some background on the various programs and pathways in the Company's EE&C Plans in Phases I, II and III for C&I customers

A. The Company's Phase I programs were generally segregated into Residential programs and C&I programs. The C&I programs included an Appliance Rebate Program, a Custom

Incentive Program, an HVAC Tune-up Program, and a Combined Heat and Power ("CHP") Program. The Company's Phase I programs also included a Customer Energy Education Program, which applied to "Residential Sector/Low Income Customers and Small Commercial Sector/Governmental Customers."

A significant majority of energy savings, costs and benefits for the Phase I C&I programs were related to the Custom Incentive Program, and those projects were dominated by efficient lighting projects.

The C&I Appliance Rebate Program proved to be uneconomic, with a Total Resource cost ("TRC") Test benefit-cost ratio of 0.32.[11] It was shut down in June 2014. The CHP program did not attract any participants. Based on the Company's evaluation, both the Custom Incentive and HVAC Tune-Up programs were cost-effective in Phase I for the combined C&I rate classes.

In Phase II, the Company merged the CHP program into the Custom Incentive program, ostensibly to reduce program administration costs. The Company also adopted a fuel switching program. The Company continued the Custom Incentive, HVAC Tune-up, and Customer Education programs.[12]

During Phase II, the HVAC Tune-up program proved to be non-economic, and was terminated. In addition, the fuel switching program failed to attract any participants, and, similarly, no CHP projects were undertaken within the Custom Incentive Program. The Custom Incentive Program exhibited a favorable TRC Test Benefit-Cost ratio over the Program Year ("PY") 4 to PY6 period, at 2.41.

[11] The TRC Test is the economic test that the Commission applies to utility EE&C programs in Pennsylvania. It generally compares the benefits of the program in terms of avoided electricity costs with the costs of the program, on a net present value ("NPV") basis. The cost basis includes costs incurred both by the utility and the participating customer. For this testimony, "passing the TRC Test" implies that the benefits of the program exceed the cost, and therefore that the TRC Test benefit-cost ratio exceeds unity.

[12] Although the Company indicated in its plan that the Customer Energy Education program was targeted at both Residential and Small C&I customers, the Company's reports for PY 4, 5 and 6 all indicate the program was directed at Residential customers.

In Phase III, the Company incorporated the Fuel Switching Program and CHP into the Custom Incentive program, which was the only program in effect for that period.

Q. In your testimony in the Phase III proceeding, you expressed significant concerns regarding the Company's method for deriving avoided costs for electric power that are used to derive the benefits associated with the EE&C programs. Has that issue been resolved?

A. From my perspective, it has. As part of the settlement of the Phase III proceeding, the Company agreed to rely on the PPL Electric avoided cost estimates for electricity. It has continued to do so in this proceeding for Phase IV.[13]

Q. Do you have any observations regarding the Company's detailed methodology for deriving TRC costs and benefits in this proceeding?

A. I have not attempted to conduct a detailed evaluation of the specific calculations. However, I did observe that the Company has not derived net-to-gross ("NTG") ratios for its TRC Test evaluations.[14] As the Company appears to have substantially relied on estimates used by PPL Electric for making its evaluations, it would be reasonable for it to also do so for the NTG parameters. My understanding is that PPL Electric uses a 0.7 NTG value for its Small C&I calculations. UGI Electric should do likewise.

Q. Please review the results of the Phase III EE&C Plan as it applies to C&I customers.

A. A summary of the actual results for PYs 8 through 11 compared to the original plan is shown in Table RDK-1 below.

[13] Attachment OSBA-I-1.2.

[14] The NTG factor is designed to reflect differences between energy savings that are actually achieved by the plan exclusive of savings that would be achieved in the absence of the plan. UGI Electric did not offer an explanation for excluding an NTG adjustment in its response to OSBA-I-9.

Table RDK-1 UGI EE&C PLAN: PHASE III SUMMARY Program Years 8 through 11						
	Total C&I		**Small C&I**		**Large C&I**	
	Actual	**Budget**	**Actual**	**Budget**	**Actual**	**Budget**
Number of Participants	103	147	66	105	37	42
MWh Savings	16,894	6,931	2,223	3,990	14,671	2,940
MWh Savings per Participant	164	47	34	38	397	70
TRC per MWh	331	478	482	453	308	510
Participant Cost per MWh	140	210	221	207	128	215
Incentive Cost per MWh	62	100	105	100	55	100
Admin Cost per MWh	78	110	116	107	73	115
Participant Share of Costs	58%	49%	54%	54%	58%	49%
TRC Test Ratio	2.60		1.98		2.76	
Source: RDK WP1						

For the Small C&I customers, the Company's actual participation, energy savings and utility costs are all well below the original plan, presumably reflecting the effects of the pandemic as well as the Company's acknowledged difficulty in reaching smaller customers. Overall participation by Small C&I customers is extremely low, with only 66 participants in a rate class group of more than 7,500. Energy savings for Large C&I customers are well ahead of budget, reflecting a few large projects, with overall customer participation. TRC Test benefit cost ratios were strong for both rate classes, indicating that avoided costs materially exceeded the combined costs for the EE&C measures of the participants and the utility. The EE&C Charge for Class 2 varied between 0.064 and .133 cents per kWh, and 0.117 and 0.266 cents per kWh for Class 3, reflecting the higher participation rates and large projects in the latter class.

In RDK WP3, I present various calculations regarding the Company's Phase III EE&C spending and savings by industry classification. That information is deemed to be highly confidential. However, in general, it indicates that warehouse customers represent nearly 70 percent of Class 3 savings in Phase III, with grocery and retail operations also representing material savings. Savings for Class 2 are more diverse, with warehousing at 37 percent, education facilities at 35 percent, retail at 20 percent, and offices at 8 percent. The Company also provides EE&C services to master-metered multi-family residences that take service in the general service classes, but the savings represent a relatively small portion of C&I EE&C activity.

With respect to the agreed limit on incentive payments from the Phase III settlement, the Company's actual costs of $62 were well below the $100 limit. However, this value appears to be somewhat skewed by some large projects for Large C&I customers, with the average incentive costs for the Small C&I customers coming in a little above the $100 figure. Similarly, for the limit on administrative costs, the actual value is well below the limit, although the Small C&I value exceeds the $110 per MWh limit by a modest amount.

In general, the Company's expectations for how project costs would be shared between the participant and the other ratepayers proved to be reasonable, with Small C&I participants bearing 54 percent of costs (matching the plan), and Large C&I participants bearing 58 percent of costs (above plan, likely due to the large projects).

Q. You indicated earlier that actual sustained load reductions may not correspond to the forecast or estimated load reductions identified in utility EE&C Plans. Does the information provided by UGI Electric in this proceeding shed any light on this issue.

A. The Company's evidence was provided in OSBA-I-4, and it is provided with this testimony in RDK WP4 (HIGHLY CONFIDENTIAL) with supplemental calculations. While that analysis cannot evaluate whether load reductions are sustained, I conclude that there is no obvious bias toward the load reduction estimates used in the EE&C Plan in Phase III. In effect, the concerns I voiced regarding the potential for overstated savings are not obviously borne out in the data. I therefore conclude that there is no need to make any adjustments to the Company's methodology for forecasting load reductions.

3. Review of Phase IV Proposals for C&I Customers

Q. What changes does the Company proposed for Phase IV for C&I customers?

A. The Company proposes to significantly scale back its efforts in the Custom Incentive Program, and add two new pathways, namely the Prescriptive program and the Direct Install Program.[15] The primary objective of these changes is to make it easier for small business customers to benefit from the EE&C funding. A summary of the key parameters for the C&I programs is shown in Table RDK-2 below.

Table RDK-2
UGI EE&C PLAN: PHASE IV SUMMARY

	Total C&I	Small C&I	Large C&I	Prescriptive	Custom	Direct
Participants/Units	7,223	1,668	5,555	7,120	10	93
MWh Savings	19,804	13,292	6,511	6,571	2,293	10,940
MWh Savings per Participant	2.7	8.0	1.2	0.9	229.3	117.6
TRC per MWh	426	501	273	151	593	557
Participant Cost per MWh	229	279	129	31	430	306
Incentive Cost per MWh	99	113	72	65	100	120
Admin Cost per MWh	98	110	72	54	62	131
Participant Share of Costs	54%	56%	47%	21%	73%	55%
TRC Test Ratio	2.18	1.82	3.52	6.56	1.43	1.63
Source: RDK WP7						

Q. Please discuss the implications of the proposed change to the Custom Incentive program.

[15] The Company has heretofore offered EE&C subsidies for CHP in its Custom Incentive program, but has not attracted any customers. It will not offer CHP subsidies in Phase IV. See OSBA-I-8.

A. The Company forecasts a significant reduction in activity, going from about 20 projects per year in Phase III to 2 per year in Phase IV (one in each rate class group), and going from being 100 percent of C&I savings to about 12 percent. The Company forecasts that the costs per MWh saved for these programs will increase substantially from the actual Phase III results, primarily related to costs incurred by participants. The Company does not explain what causes either the increase in overall cost or the increased participant share.[16] However, the per-MWh incentive costs and administrative costs that will be borne by other ratepayers remain at levels consistent with the past, and with the settlement of the Phase III proceeding. The overall TRC Test ratio remains favorable, although less so than the past due to higher participant costs.

Q. Please discuss the implications of the proposed Prescriptive Pathway.

A. The Prescriptive Pathway will offer the simplest option for customers to benefit from the EE&C program, albeit one with the lowest incentive payment ($70 per MWh saved). Customers who purchase qualifying equipment will be able to simply submit a rebate application, and they receive a rebate if the application is approved. This pathway initially will apply only to lighting equipment, but it may be expanded to include other equipment (e.g., refrigeration, HVAC). The Company calculates participation by the number of units for which rebates will be provided, and it estimates that nearly 80 percent of the rebates will go to Large C&I customers.[17]

The Prescriptive Pathway is estimated to represent about one-third of overall C&I savings. Based on the Company's analysis, this program is extremely attractive, with total resource costs far lower than any other program, and a TRC Test ratio over 6.5. Compared to other programs, both incentive costs and administrative costs are relatively modest.

Q. Do you have any concerns regarding this program?

A. As a general statement, I agree with the Company that it should make a greater effort to encourage more small business customers from the EE&C C&I programs, which

[16] The increased participant cost may reflect a focus on larger projects, for which incentive payments are capped.

[17] I expect that this reflects multiple units for each participating customer, particularly for the Large C&I customers. It is therefore unclear how many customers are expected to participate in this program.

heretofore have primarily focused on larger customers with larger projects (all subsidized by non-participating small business customers). Thus, I do not want to discourage the Company from attempting to try alternative approaches to broaden participation.

Having said that, however, I have two concerns. First, the Company has not explained how this program will be different from the Appliance Rebate program in Phase I which proved to be uneconomic. However, I expect that it will be able to do so in its rebuttal testimony. Second, and more importantly, based on the Company's analysis, the incentives appear to be unduly generous. As proposed, the participant will contribute only about 3.1 cents per annual kWh saved. Since the variable charge for electricity is about 18.1 cents per kWh for a typical GS-1 customer, and 16.0 cents per kWh for a typical GS-4 customer, the payback period is less than 3 months for both GS-1 and GS-4 customers. As the Company assumes the investment will provide value for 15 years, the required contribution from the participant is unduly low.

In that respect, I first recommend that the Company check its cost figures for the program. At a cost of about 15 cents per kWh saved (inclusive of a hefty administrative cost charge), the payback period for a customer is less than a year. As such, customers have a strong incentive to adopt the lighting changes without any need for subsidy.[18]

If the Company has confidence in the overall cost assessment for this program, I then recommend that it modify the incentive levels to improve the contribution from participants (and thus reduce the burden on non-participants). Given the low costs for the program, a rough calculation suggests that reducing the incentive to 3 cents per kWh saved would increase the participant cost to about 44 percent of program cost. Even with this substantial reduction, the payback period for the customer would be less than six months.

Q. Please discuss the implications of the proposed Direct Install Pathway.

A. The Company's proposed Direct Install pathway is a simpler and more economically attractive alternative to the Custom Installation program, limited to customers in Class 2

[18] In effect, these economics would suggest that the NTG ratio for these investments would be low.

UGI Electric summarizes the key differences in the Direct Pathway approach as the following:

- *Only small business customers can participate in the direct install pathway.*
- *The direct install pathway includes a free assessment of energy savings opportunities, the custom pathway does not.*
- *The direct install pathway provides referrals to trade allies to perform work, the custom pathway does not.*
- *The direct install pathway offers higher incentives than the custom pathway.*[19]

The Company forecasts that it will have 11 projects in the first year of Phase IV, rising to 22 projects by the fifth year. However, the Company forecasts that the average first-year MWh savings per project will be 118 MWh, which is somewhat surprising since the *total* annual load is 5 MWh for an average GS-1 customer, and 49 MWh for an average GS-4 customer. If indeed the Company plans to achieve first-year savings of 118 MWh per project, it apparently plans to target only relatively large GS-4 customers for this program. It is unclear how that is consistent with the desire to provide greater benefits to small business customers.[20]

Q. What do you recommend with respect to the Direct Install program?

A. I reiterate that it is reasonable for the Company to experiment with alternatives to the Custom program to provide benefits to smaller customers within the overall C&I group. However, it is not clear how the proposed program achieves those objectives. I recommend that the Company develop an alternative that (a) has lower overall cost, and (b) focuses on smaller customers within the Class 2 rate class group.

[19] OSBA-I-10(b).

[20] By way of a rough calculation, if the Direct Install program had a goal of reducing a customer's load by, say, 20 percent, the current customer load would be some 600 MWh per year, or a peak demand of about 135 kW (at 50% load factor). The Commission considers any customer over 100 kW to be sufficiently large to be ineligible for fixed default service rates.

Q. Overall, is the Company's proposal consistent with the provisions of the settlement for Phase III in respect of incentive and administrative costs?

A. A summary of the proposed per-MWh costs is shown in Table RDK-3 below.

Table RDK-3
C&I Incentive and Administrative Cost Summary ($/MWh saved)

	Incentive	Administrative
Phase III Settlement Cap	$100	$110
Phase III To-Date Actual	$ 62	$ 78
Phase IV Total	$ 99	$ 98
Phase IV Small C&I	$113	$110
Phase IV Large C&I	$ 72	$ 72
Phase IV Prescriptive	$ 65	$ 54
Phase IV Custom	$100	$ 62
Phase IV Direct	$120	$131
Source: RDK WP7		

As shown, for the Combined Class 2 and Class 3, both the incentive costs ($99 per MWh) and administrative cost ($98 per MWh) are within the existing limits. When viewed on a class basis, the incentive costs exceed the limit for Class 2, due primarily to the relatively higher incentives offered in the Direct Install Program.

Q. What, then, do you recommend with respect to the caps on C&I costs?

A. I retain my view that UGI Electric has a lower economic incentive for cost control than do other EDCs in Pennsylvania. I therefore recommend that the current restrictions remain in place as a class average limit, and that they be applied individually to Class 2 and Class 3. As the $100 MWh limit on incentives represents a 62 percent increase over the Phase III actual costs, and the $110 per MWh limit on administrative costs is a 40 percent increase

over Phase III actual, I do not believe these represent unreasonable caps.[21]

Q. Please discuss the implications of the Company's proposal on C&I customer bills.

A. The Company's analysis is provided in OSBA-I-15, which includes a correction to the originally filed Exhibit KMB-1. I have incorporated some additional calculations in RDK WP5.

That analysis indicates that the annual program cost, inclusive of portfolio-wide costs, that will be imposed on Class 2 customers rises from about $164,000 based on the current EE&C charge to maximum of $821,000 in Year 3, an increase of some $657,000. By way of contrast, the increase to GS-1 and GS-4 customers in the Company's recent base rate case was about $724,000, and so the Company's proposal would almost double the base rate increase. The EE&C charge for Class 2 would rise from the current level of 0.106 cents per kWh to 0.591 cents per kWh in the third year, a more than 5-fold increase. At the peak, the EE&C charge would represent 3.0/3.7 percent of the typical GS-1/GS-4 bundled bills, and 7.7/15.1 percent of the GS-1/GS-4 base rates bill.

Note also that the Company does not propose comparable increases to the EE&C charges for the other rate class groups. The residential class (Class 1) would see an increase from 0.109 cents per kWh to 0.212 cents per kWh, a large increase but far less than that for Class 2. And Class 3 would experience a decrease in the charge, from 0.190 to 0.086 by the third year. Moreover, the highest EE&C charge UGI Electric has imposed since mid-2015 was 0.266 cents per kWh (for Class 3), and the Company's proposal for Class 2 in Phase IV is more than double that.[22]

[21] In making this recommendation for the Class 2 customer group, I recognize that actual Phase III costs were modestly higher than these limits. However, for Phase IV, the adoption of the Prescriptive program should allow the Company to materially reduce both incentive and administrative costs. And while the Direct Install program may put some upward pressure on incentive costs, it should be less costly to administer than the Custom program.

[22] The Company did impose higher charges on Class 2 customers in Phase I (up to about 0.35 cents per kWh), but that resulted from an inaccurate accounting of costs and was subsequently offset by lower charges when the error was corrected.

A 0.591 cent per kWh EE&C charge would also be higher than the comparable charges at other Pennsylvania EDCs, often considerably higher, as shown in Table RDK-4 below.

Table RDK-4 **Current EE&C Charges at Pennsylvania EDCs** **Small C&I Customer Classes**	
UGI Current	0.106
UGI Proposed PY 12	0.334
UGI Proposed PY 14	**0.591**
PPL Electric	0.315
PECO Electric	0.458
Metropolitan Edison	0.129
Penelec	0.175
Penn Power	0.206
West Penn	0.167
Duquesne Light	0.510
Source: Company tariffs, reviewed 28 November 2023	

Q. What, then, do you recommend with respect to the Company's Plan for Class 2 C&I customers?

A. The Company's proposed increase in the EE&C charge for Class 2 is unreasonable and excessive. I recommend that the Company scale back the size of the programs targeted at Class 2 customers, notably the large projects it envisions in the Direct Install pathway, or pursue opportunities for participating customers to bear a more reasonable share of the costs, notably in the Prescriptive pathway. In light of the charges at other EDCs and the Company's proposals for the other UGI Electric customers, I suggest that the Plan be modified to anticipate Class 2 EE&C charges of no more than 0.35 cents per kWh.

4. Summary of Recommendations

Q. Please summarize your recommendations.

A. My recommendations are as follows:

- The Company's Plan should be modified to reflect reasonable net-to-gross values.

- The per-MWh limits on incentive costs and administrative costs for the C&I programs should be retained, and they should be applied separately on an average basis to both Class 2 and Class 3.

- The Company should verify its calculations of the costs for the Prescriptive pathway. If the calculations are accurate, it should reduce the magnitude of the incentives to provide a more reasonable balance between the participant and the non-participating ratepayers.

- The Company should modify its forecasts for the Direct Install program to reflect providing EE&C services to businesses of all sizes within the Class 2 rate group.

- The Company's proposed increase to the Class 2 EE&C charge is excessive. The Plan should be modified to reduce utility costs associated with Class 2, by reducing programs, modifying programs to target smaller projects, and shifting cost responsibility to the participants who benefit from the programs.

Q. Does this conclude your direct testimony?

A. Yes, it does.

EXHIBIT RDK-1

RÉSUMÉ AND EXPERT TESTIMONY LIST

FOR

ROBERT D. KNECHT

Overview

Mr. Knecht has more than 40 years of economic consulting experience, focusing on the energy, utility, metals and mining industries. For the past 30 years, Mr. Knecht's practice has primarily involved providing analysis, consulting support and expert testimony in regulatory matters, primarily involving electric and natural gas utilities. Mr. Knecht's work includes many aspects of utility regulation, including industry restructuring, cost unbundling, cost allocation, rate design, rate of return, customer contributions, energy efficiency programs, smart metering programs, treatment of stranded costs and utility revenue requirement issues. He has consulted to state advocacy agencies, industrial customer groups, law firms, regulatory agencies, government agencies and utilities, in both the United States and Canada. He has provided expert testimony in more than one hundred separate utility proceedings.

In addition to his work with regulated utilities, Mr. Knecht has consulted on international industry restructuring studies, prepared economic policy analyses, participated in a variety of litigation matters involving economic damages, and developed energy industry forecasting models.

Mr. Knecht served as a Principal of IEc for 33 years, and as its Treasurer for 15 years. He is currently an independent consultant who remains affiliated with IEc.

Education

Master of Science, Management (Applied Economics and Finance), Sloan School of Management, M.I.T.

Bachelor of Science, Economics, Massachusetts Institute of Technology

Select Project Experience

For more than 25 years, Mr. Knecht has provided consulting services, analysis and expert testimony before the Pennsylvania Public Utility Commission on all manner of regulatory proceedings to the **PENNSYLVANIA OFFICE OF SMALL BUSINESS ADVOCATE**. In addition to expert testimony, Mr. Knecht has assisted OSBA with the development of public policy positions, litigation strategy, and longer term strategy.

For the **ATTORNEY GENERAL OF THE STATE OF RHODE ISLAND**, Mr. Knecht provided consulting and expert witness services in an acquisition proceeding involving PPL Corporation's proposed acquisition of Narragansett Electric from National Grid. Mr. Knecht's testimony addressed financial, economic, environmental, tax, operating cost and rate implications.

For the **NEW BRUNSWICK PUBLIC INTERVENER,** Mr. Knecht provides consulting and expert witness services in a variety of regulatory proceeding before the New Brunswick Energy and Utilities Board involving New Brunswick Power, Enbridge Gas New Brunswick, and petroleum products. Mr. Knecht has addressed issues of load forecasting, costs forecasting, cost of capital, allocation of corporate overhead costs, utility cost allocation, revenue allocation, market-based rate design, cost-based rate design, and rate decoupling.

For **L'ASSOCIATION QUÉBÉCOISE DES CONSOMMATEURS INDUSTRIELS D'ÉLECTRICITÉ (AQCIE) AND LE CONSEIL DE L'INDUSTRIE FORESTIÈRE DU QUÉBEC (CIFQ)**, Mr. Knecht provided analysis, consulting advice and expert testimony before the Régie de l'énergie in regulatory matters involving Hydro Québec Distribution and TransÉnergie. This work includes revenue requirement, power purchasing, cost allocation, treatment of cross-subsidies, and rate design.

For the **INDEPENDENT POWER PRODUCERS SOCIETY OF ALBERTA**, Mr. Knecht provided consulting advice, analysis and expert testimony before the Alberta Energy and Utilities Board in a series of proceedings involving the restructuring of the electric utility industry, the unbundling of rates, and the development of transmission rates.

IEc

INDUSTRIAL ECONOMICS, INCORPORATED

ROBERT D. KNECHT

EXPERT TESTIMONY SUBMITTED IN REGULATORY PROCEEDINGS (2016-2021)

DOCKET #	REGULATOR	UTILITY	DATE	CLIENT	TOPICS
D-21-09	RI Division of Public Utilities and Carriers	PPL Electric, National Grid	November 2021	Attorney General of the State of Rhode Island	Acquisition financial impacts, due diligence, environmental impacts, tax implications, operating costs, rates.
R-2020-3025652	Pennsylvania Public Utility Commission	UGI Utilities, Inc. (Gas Division)	July 2021	Pennsylvania Office of Small Business Advocate	Renewable natural gas procurement.
R-2021-3024750	Pennsylvania Public Utility Commission	Duquesne Light Company	June 2021	Pennsylvania Office of Small Business Advocate	Cost allocation, rate design
R-2021-3024296	Pennsylvania Public Utility Commission	Columbia Gas of Pennsylvania	June 2021	Pennsylvania Office of Small Business Advocate	Economic viability, cost allocation, rate design.
R-2021-3023618	Pennsylvania Public Utility Commission	UGI Utilities Inc. (Electric Division)	May 2021	Pennsylvania Office of Small Business Advocate	Cost allocation, rate design
R-2020-3023970	Pennsylvania Public Utility Commission	Philadelphia Gas Works	April 2021	Pennsylvania Office of Small Business Advocate	Procurement of renewable natural gas
R-2020-3022134	Pennsylvania Public Utility Commission	Pike County Light & Power Company (Gas)	February 2021	Pennsylvania Office of Small Business Advocate	Cost allocation, rate design.
R-2020-3022135	Pennsylvania Public Utility Commission	Pike County Light & Power Company (Electric)	February 2021	Pennsylvania Office of Small Business Advocate	Cost allocation, rate design.
Matter 485	New Brunswick Energy & Utilities Board	Retail Petroleum Distributors	February 2021	Pennsylvania Office of Small Business Advocate	Maximum retail margins.
R-2020-3018929	Pennsylvania Public Utility Commission	PECO Energy Company (Gas Division)	December 2020	Pennsylvania Office of Small Business Advocate	Cost allocation, revenue allocation, rate design, negotiated rates
P-2020-3021191	Pennsylvania Public Utility Commission	Peoples Natural Gas Company LLC	December 2020	Pennsylvania Office of Small Business Advocate	Sharing benefits of tax repair election
Matters 467, 478	New Brunswick Energy & Utilities Board	Liberty Utilities (Gas New Brunswick)	October 2020	New Brunswick Public Intervener	Historical financial review, test year revenue requirement, earnings sharing mechanism, cost allocation, rate design, deferral accounts
P-2020-3019907	Pennsylvania Public Utility Commission	UGI Utilities, Inc. (Electric Division)	August 2020	Pennsylvania Office of Small Business Advocate	Default service procurement
R-2020-3018835	Pennsylvania Public Utility Commission	Columbia Gas of Pennsylvania	July 2020	Pennsylvania Office of Small Business Advocate	Cost allocation, revenue allocation, rate design, flex rates
P-2020-3019356	Pennsylvania Public Utility Commission	PPL Electric	June 2020	Pennsylvania Office of Small Business Advocate	Default service procurement, TOU rates, renewable energy rates

EXPERT TESTIMONY SUBMITTED IN REGULATORY PROCEEDINGS (2016-2021)

DOCKET #	REGULATOR	UTILITY	DATE	CLIENT	TOPICS
R-2020-3017206	Pennsylvania Public Utility Commission	Philadelphia Gas Works	June 2020	Pennsylvania Office of Small Business Advocate	Revenue requirement, cost allocation, revenue allocation, rate design
R-2020-3018993	Pennsylvania Public Utility Commission	Columbia Gas of Pennsylvania	May 2020	Pennsylvania Office of Small Business Advocate	Purchased gas costs, interest on penalty credits.
R-2019-3015162	Pennsylvania Public Utility Commission	UGI Utilities, Inc. – Gas Division	May 2020	Pennsylvania Office of Small Business Advocate	Revenue requirement, rate of return, load forecast, cost allocation, revenue allocation, rate design, interruptible service, line extension
R-2020-3015251	Pennsylvania Public Utility Commission	National Fuel Gas Distribution	March 2020	Pennsylvania Office of Small Business Advocate	Charge for monthly metered transportation service
Matter 458	New Brunswick Energy & Utilities Board	New Brunswick Power	December 2019	New Brunswick Public Intervener	Historical financial review, DSM, rate trajectory, revenue requirement, cost allocation, rate design
P-2019-3012628	Pennsylvania Public Utility Commission	Pennsylvania Power Company	November 2019	Pennsylvania Office of Small Business Advocate	Waiver of distribution system improvement charge cap.
Matters 443, 453	New Brunswick Energy & Utilities Board	Enbridge Gas New Brunswick	October 2019	New Brunswick Public Intervener	Historical financial review, regulatory deferral account, system expansion test, revenue requirement, return on rate base, load forecast, corporate allocations, cost allocation, rate design, sharing mechanism, income taxes
Matter 444	New Brunswick Energy & Utilities Board	Petroleum Distributors	August 2019	New Brunswick Public Intervener	Motor fuel and home heating oil maximum margins
R-2018-3006814	Pennsylvania Public Utility Commission	UGI Utilities, Inc. -- Gas Division	April 2019	Pennsylvania Office of Small Business Advocate	Incentive mechanism, cost allocation, rate design, rate harmonization, expansion program, EE&C plan.

EXPERT TESTIMONY SUBMITTED IN REGULATORY PROCEEDINGS (2016-2021)

DOCKET #	REGULATOR	UTILITY	DATE	CLIENT	TOPICS
Matter 430	New Brunswick Energy & Utilities Board	New Brunswick Power	April 2019	New Brunswick Public Intervener	Historical financial review, DSM, rate trajectory, revenue requirement, long-term planning, load forecast, deferral accounts, cost allocation, rate design
A-2018-3006061 et al.	Pennsylvania Public Utility Commission	Aqua Pennsylvania, Peoples Gas	April 2019	Pennsylvania Office of Small Business Advocate	Financial implications for acquisition, affirmative public benefits
M-2018-3004144	Pennsylvania Public Utility Commission	UGI Utilities, Inc., Electric Division	November 2018	Pennsylvania Office of Small Business Advocate	Energy efficiency plan, performance, forecast, cost sharing, avoided costs
P-2018-3002709	Pennsylvania Public Utility Commission	Pike County Light & Power	September 2018	Pennsylvania Office of Small Business Advocate	Default service procurement, hedging strategies
R-2018-2647577	Pennsylvania Public Utility Commission	Columbia Gas of Pennsylvania	June 2018	Pennsylvania Office of Small Business Advocate	C&I Network costs, cost allocation, revenue allocation, rate design
R-2018-3000253	Pennsylvania Public Utility Commission	Columbia Gas of Pennsylvania	June 2018	Pennsylvania Office of Small Business Advocate	Design day demand forecasting
A-2017-2629534	Pennsylvania Public Utility Commission	PPL Electric Utilities	April 2018	Pennsylvania Office of Small Business Advocate	Corporate restructuring
R-2017-2640058	Pennsylvania Public Utility Commission	UGI Utilities, Inc., Electric Division	April 2018	Pennsylvania Office of Small Business Advocate	Cost allocation, revenue allocation, rate design
M-2017-2640306	Pennsylvania Public Utility Commission	Peoples Natural Gas	April 2018	Pennsylvania Office of Small Business Advocate	Energy efficiency and conservation plan, combined heat and power plan.
C-2017-2633651	Pennsylvania Public Utility Commission	PPL Electric Utilities	March 2018	Pennsylvania Office of Small Business Advocate	Present OSBA legal position
P-2017-2636755, 2637857, 2637858, 2637866	Pennsylvania Public Utility Commission	Metropolitan Edison, Pennsylvania Electric, Pennsylvania Power, West Penn Power	February 2018	Pennsylvania Office of Small Business Advocate	Default service procurement plans, eligibility rules, risk premiums, market enhancement mechanism, TOU rates, net metering

EXPERT TESTIMONY SUBMITTED IN REGULATORY PROCEEDINGS (2016-2021)

DOCKET #	REGULATOR	UTILITY	DATE	CLIENT	TOPICS
Matter 375	New Brunswick Energy & Utilities Board	New Brunswick Power	January 2018	New Brunswick Public Intervener	Integrated resource plan, demand side management, long term rate trajectory, rate adjustment mechanism, revenue requirement, cost allocation, rate design
M-2016-2578051	Pennsylvania Public Utility Commission	PPL Electric Utilities	December 2017	Pennsylvania Office of Small Business Advocate	Time-of-use rates, net metering
Matter 371	New Brunswick Energy & Utilities Board	Enbridge Gas New Brunswick	October 2017	New Brunswick Public Intervener	Capital expenditure prudence, allocated corporate costs, revenue requirement, flex rates, tariff language.
R-2017-2602627, 2602633, 2602638	Pennsylvania Public Utility Commission	UGI Utilities, Gas Division, Central Penn Gas, Penn Natural Gas	June 2017	Pennsylvania Office of Small Business Advocate	Consolidation of purchased gas cost filings.
R-2017-2586783	Pennsylvania Public Utility Commission	Philadelphia Gas Works	May 2017	Pennsylvania Office of Small Business Advocate	Revenue requirement relevance, financial review, cost allocation, revenue allocation, rate design
R-2016-2580030	Pennsylvania Public Utility Commission	UGI Penn Natural Gas	April 2017	Pennsylvania Office of Small Business Advocate	Test year, load forecast, O&M expenses, rate base, rate of return, cost allocation, rate design, EE&C program, capacity assignment
Matter 336	New Brunswick Energy & Utilities Board	New Brunswick Power	January 2017	New Brunswick Public Intervener	Financial forecast, equity requirement, depreciation life, variance mechanisms, cost allocation, rate design
Matter 338	New Brunswick Energy & Utilities Board	Generic	December 2016	New Brunswick Public Intervener	Retail petroleum margins
Matter 330	New Brunswick Energy & Utilities Board	Enbridge Gas New Brunswick	September 2016	New Brunswick Public Intervener	Revenue requirement, investment test, customer retention initiatives, cost allocation, rate design
R-2016-2537359	Pennsylvania Public Utility Commission	West Penn Power Company	July 2016	Pennsylvania Office of Small Business Advocate	Cost allocation, revenue allocation, rate design.

EXPERT TESTIMONY SUBMITTED IN REGULATORY PROCEEDINGS (2016-2021)

DOCKET #	REGULATOR	UTILITY	DATE	CLIENT	TOPICS
R-2016-2537355	Pennsylvania Public Utility Commission	Pennsylvania Power Company	July 2016	Pennsylvania Office of Small Business Advocate	Cost allocation, revenue allocation, rate design.
P-2016-2537609, 2537594	Pennsylvania Public Utility Commission	UGI Central Penn Gas, UGI Penn Natural Gas	July 2016	Pennsylvania Office of Small Business Advocate	Waiver of DSIC cap.
P-2016-2543523	Pennsylvania Public Utility Commission	UGI Utilities, Inc., Electric Division	July 2016	Pennsylvania Office of Small Business Advocate	Default service procurement.
R-2016-2529660	Pennsylvania Public Utility Commission	Columbia Gas of Pennsylvania, Inc.	June 2016	Pennsylvania Office of Small Business Advocate	Cost allocation, revenue allocation, rate design.
R-2015-2469275	Pennsylvania Public Utility Commission	PPL Electric Utilities Corporation	May 2016	Pennsylvania Office of Small Business Advocate	Default service procurement plan.
R-2015-2518438	Pennsylvania Public Utility Commission	UGI Utilities, Inc., Gas Division	April 2016	Pennsylvania Office of Small Business Advocate	Cost allocation, revenue allocation, rate design, energy efficiency and conservation program.
P-2016-2521993	Pennsylvania Public Utility Commission	Columbia Gas of Pennsylvania, Inc.	April 2016	Pennsylvania Office of Small Business Advocate	Waiver of DSIC cap.
M-2015-2477174	Pennsylvania Public Utility Commission	UGI Utilities, Inc., Electric Division	February 2016	Pennsylvania Office of Small Business Advocate	Energy efficiency and conservation plan review and development.
Matter No. 306	New Brunswick Energy & Utilities Board	Enbridge Gas New Brunswick	February 2016	New Brunswick Public Intervenor	Financial review, investment prudence, revenue requirement, cost allocation, rate design, market-based pricing.
P-2015-2511333, 2511351, 2511355, 2511356	Pennsylvania Public Utility Commission	Metropolitan Edison, Pennsylvania Electric, Pennsylvania Power, West Penn Power	January 2016	Pennsylvania Office of Small Business Advocate	Default service procurement plans, purchase of receivables.

Note: Dates shown reflect submission date for direct testimony.

February 2022

EXHIBIT RDK-2

REFERENCED INTERROGATORY RESPONSES

OSBA-I-1*

OSBA-I-4 HIGHLY CONFIDENTIAL**

OSBA-I-8

OSBA-I-9

OSBA-I-10 HIGHLY CONFIDENTIAL**

OSBA-I-15*

* Electronic attachments are incorporated by reference.

**These Referenced Interrogatories are HIGHLY CONFIDENTIAL; therefore, are available upon request via email to Steven C. Gray, sgray@pa.gov.

UGI Utilities, Inc. - Electric Division
Docket No. M-2023-3043230
Phase IV EE&C Approval
Responses to OSBA Set I (1-15)
Delivered on October 23, 2023

OSBA-I-1

Request:

In "live" MS Excel electronic format with formulae intact, please provide all workpapers supporting the Phase IV EE&C Plan.

Response:

Please reference the following Excel workbooks:

Attachment OSBA-I-1.1 – UGI Electric Phase IV EE&C Plan Portfolio Projections.xlsx
Attachment OSBA-I-1.2 – UGI Electric Phase IV EE&C Plan Avoided Costs.xlsx

Prepared by or under the supervision of: Theodore M. Love

OSBA-I-8

Request:

Reference Docket No. M-2018-3004144, August 30, 2023 Report for Program Year 11 at 20; Phase IV EE&C Plan:

a. The annual report makes reference to potential CHP projects. Please provide full details of any CHP projects undertaken within the EE&C plan in Phase III.

b. The Phase IV EE&C Plan appears to make no reference to CHP projects. Please indicate whether UGI Electric intends to continue to pursue such projects in Phase IV. If so, please provide full details.

Response:

a. Although CHP projects are available as a measure under the C&I Custom Program, the Company has not undertaken any CHP projects nor have any CHP related expenses been incurred in Phase III.

b. The Company does not intend to offer CHP projects in its Phase IV Electric EE&C Plan.

Prepared by or under the supervision of: Theodore M. Love

OSBA-I-9

Request:

Reference Petition Exhibit 1, proposed Phase IV EE&C Plan, Section 2.2, prescriptive pathway:

a. Please explain in detail why the prescriptive pathway is a necessary supplement to the custom pathway.

b. Regarding the prescriptive pathway, please explain whether the CSP's evaluation of the eligibility for and magnitude of the rebate will take place before or after (or both) the project is undertaken. Please explain the rationale.

c. Please indicate how the 7 to 10 cent per saved kWh values for this pathway were derived, and explain why these values are materially lower than those offered through the custom pathway and the direct install pathway.

d. Please explain why this pathway will initially be limited to lighting projects. Please detail the types of lighting projects that the Company anticipates will qualify for these rebates.

e. Please explain generally how the net-to-gross ("NTG") ratio for prescriptive pathway projects will be derived, and the rationale for that determination.

Response:

a. The prescriptive pathway offers a cheaper, easier and faster way for customers to participate in UGI Electric's proposed Commercial and Industrial Program, as discussed on page 16 of my direct testimony. The prescriptive pathway will provide a uniform application for covered measures that is then verified by the program Conservation Service Provider (CSP) and then a fixed rebate is provided to the customer. UGI Electric and its ratepayers will save money through lower overhead associated with this approach and the lower incentives offered. Customers will benefit from knowing the amount of the rebate up front and having a streamlined application process. However, not all energy savings opportunities fit into this approach, and as proposed, it will initially start with commercial lighting measures. The custom pathway provides a way for customers to receive incentives for measures not covered in the prescriptive pathway, such as refrigeration and HVAC measures. Customers can go through the custom pathway to receive an incentive tied to directly

OSBA-I-9 (Continued)

to the energy savings from their project. The rebates are higher to incent customers to go further than prescriptive lighting and work through a more involved rebate process.

b. As described on page 31 of Exhibit 1, the prescriptive pathway will offer a fixed rebate to eligible UGI customers who's installed equipment meets the efficiency requirements. The customer will know what the rebates are via program materials before they undertake a project, and will be paid rebates based on the installed equipment. To receive a rebate, the customer must provide a valid account, proof of purchase, and details on the installed equipment. The CSP will validate this information, and a portion of prescriptive rebates will also have an on-site inspection.

c. The incentives for the prescriptive pathway are designed to be generally in-line with other prescriptive lighting offerings in the area, such as those from PPL.

   As discussed in part (a.) of this response, prescriptive incentives are lower than the custom pathway since they are for a simpler, single-measure, approach.

   Incentives for the direct install pathway are higher to encourage more participation by small business customers.

d. The prescriptive pathway will be initially limited to lighting projects since this covers the vast majority of historical activity in UGI Electric's nonresidential electric energy efficiency programs. While it will start with lighting, if UGI Electric begins to see an uptick in certain non-lighting measure that would be better served via a prescriptive approach, it may offer these measures through the prescriptive pathway. If a measure is offered through the prescriptive pathway, it will no longer be eligible for a custom incentive. UGI Electric plans to capture projects that are doing LED retrofits, including linear, high bay, low bay, fixtures, and exterior LED products.

e. UGI Electric does not plan to calculate net-to-gross ratios for the EE&C plan.

Prepared by or under the supervision of: Theodore M. Love

OSBA-I-15

Request:

Reference Statement No. 2, Exhibit KMB-1:

a. Please confirm that Exhibit KMB-1 implies a significant shift in Non-Residential cost incurrence, away from Class 3 (Large C&I) and to Class 2 (Small C&I). If you cannot confirm, please explain your response.

b. Please explain how the Company segregated its costs estimates between small and large non-residential customer groups, and provide supporting workpapers.

c. Please explain why it is reasonable to forecast that the EEC Rider for Class 2 will increase from its current level of 0.106 cents per kWh to 0.591 cents per kWh in Year 3.

d. Please confirm that Years 1 to 5 in this table correspond to PYs 13 to 17 in the EE&C Plan. If you cannot confirm, please explain the difference, and show how the cost values were derived for Years 1 to 5 from the plan values.

e. Please provide supporting calculations for the allocation of administrative costs as shown in the referenced tables, in MS Excel electronic format.

f. Please provide supporting calculations for the percentage base rate impacts, in MS Excel electronic format.

g. Please explain how the "Class 2" rates were derived for each year, and provide supporting assumptions and workpapers.

Response:

While preparing the responses below, it was discovered that the Class Rates and the Cumulative Rate Impact for Years 1 - 5 on the original exhibit were overstated. The Class Rates shown on the original Exhibit KMB-1 were calculated by taking the calculated Base Rate as shown and adding to that the calculated EEC Rates for Years 1-5. Since the Base Rate shown included the EEC Rider Rate as of July 1, 2023, the EEC Rider Rate was being included twice. The Revised Exhibit KMB-1 has been updated to remove the EEC Rider Rate that was included in the calculated Base Rate before adding the calculated EEC Rider Rates for Years 1 - 5. Making this correction also resulted in revised Cumulative Rate Impacts. Please note that all base rate calculations were updated

OSBA-I-15 (Continued)

to reflect rates as of October 1, 2023, which includes rate changes approved in Docket No. R-2022-3037368 (Order entered September 21, 2023). Please see Attachment OSBA-I-15 for a revised copy of Exhibit KMB-1.

a. Revised Exhibit KMB-1 does show a shift in Non-Residential cost incurrence that aligns with the new program offerings targeting Small C&I customers. In the proposed Phase IV EE&C Plan, Class 2 (Small C&I) accounts for approximately 76% of the C&I Custom Incentive Program costs whereas Class 3 (Large C&I) accounts for the remaining 24%. This is a significant shift in Non-Residential cost incurrence compared to Phase III, where Class 2 accounted for approximately 21% of spending and Class 3 accounted for approximately 79%. The reason for this shift is that the Company is proposing program changes that will make it easier for small business customers to participate in the C&I Incentive Program, through the adoption of the Prescriptive and Direct Install Pathways. Additionally, the majority of the spending that occurred in Phase III was related to new construction for Class 3 customers.

b. The Company projected participation for the C&I Incentive Program between Large C&I and Small C&I customers, which provided a projection for incentives split between Large C&I and Small C&I. Non-incentive costs for the C&I Incentive Program were split between the Large C&I and Small C&I rate classes using the percentage split between incentive payments in each year for the Large C&I and Small C&I customers in the program. Portfolio-wide costs were similarly allocated to each rate class, Residential, Large C&I, and Small C&I, using that rate class's percentage of all incentives projected in each year. Please see the response to OSBA-I-1 for the Excel workbook where this calculation was performed.

c. Consistent with Act 129, the EEC Rider is calculated based on projected annual program costs and participation and includes an annual reconciliation. As previously discussed above, the proposed Phase IV EE&C Plan contains changes to make it easier for Class 2 (Small C&I) to participate in the EE&C program. As a result, the Company anticipates greater participation by Class 2 customers and therefore greater program costs associated with those customers. The projected rates for Class 2 customers reflects this increase in Class 2 costs, consistent with cost causation principles. Furthermore, the year over year total rate change for each of the five years of the plan is small and the overall change is gradual. A Class 2 customer with a 5kW Demand and 1,000 kWh monthly use would have a total rate change of 1.0% in Year 1, 0.6% in Year 2, 0.6% in Year 3, (0.1%) in Year 4, and 0.1% in Year 5. A Class 2 customer with a 25kW Demand and 10,000 kWh monthly use would have a total rate change of 1.3% in Year 1, 0.8% in Year 2, 0.8% in Year 3, (0.1%) in Year 4, and 0.1% in Year 5.

OSBA-I-15 (Continued)

d. Years 1 to 5 in the table in Statement No. 2, Exhibit KMB-1 and the revised table included as Attachment OSBA-I-15 correspond to PYs 13 to 17.

e. The $1.745M of administrative costs over the five years were allocated based on projected incentive spending by rate class. Please see Attachment OSBA-I-15(e).

f. Please see Attachment OSBA-I-15(f).

g. To calculate the Class 2 rates, the Company used base sales, projected energy savings, and program costs. The starting base sales used were taken from the Company's most recent base rate case proceeding at Docket No. R-2022-3037368 and include sales for all C&I rate classes (excluding Rate HTP and LP). Annual sales for the Plan Years were then calculated by subtracting the cumulative projected energy sales from the starting base sales. The annual projected EE&C Class 2 Program Costs were then divided by the annual Projected Class 2 Usage. These calculated rates were then adjusted to include the applicable Gross Receipts Tax of 5.9%. See Attachment OSBA-I-15(f) for the associated workpapers.

Prepared by or under the supervision of: Kimberly M. Bassininsky

REVISED Exhibit KMB-1

UGI Utilities, Inc. - Electric Division
Phase IV Energy Efficiency and Conservation Plan
Development and Impact of Energy Efficiency and Conservation Rate
"Phase IV EEC Rider"

Class 1 - Residential

Plan Year		**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	
Program Cost - Residential[1]		$1,143,544	$1,203,959	$1,206,100	$1,144,255	$1,157,934	
Declining Projected Residential Usage (kWh)		609,633,763	607,142,986	604,529,630	601,832,595	599,051,881	
EEC Rate (¢/kWh)[2]		0.199	0.211	0.212	0.202	0.205	
Current Residential Rate (¢/kWh):	**Base Rate**[3]						
500 kWh Monthly Use	20.718	20.858	20.870	20.871	20.861	20.864	***REVISED***
1,000 kWh Monthly Use	19.641	19.781	19.793	19.794	19.784	19.787	***REVISED***
1,500 kWh Monthly Use	19.283	19.423	19.435	19.436	19.426	19.429	***REVISED***
Cumulative Rate Impact:							
500 kWh Monthly Use		0.68%	0.73%	0.74%	0.69%	0.70%	***REVISED***
1,000 kWh Monthly Use		0.71%	0.77%	0.78%	0.73%	0.74%	***REVISED***
1,500 kWh Monthly Use		0.73%	0.79%	0.79%	0.74%	0.76%	***REVISED***
Average EEC charge per Monthly Residential Bill		$1.70	$1.79	$1.80	$1.70	$1.72	

Class 2 - Non-Residential (All non-residential rates plans excluding LP and HTP)

Plan Year		**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	
Program Cost - Class 2[1]		$480,395	$655,085	$821,428	$773,929	$772,775	
Declining Projected Class 2 Usage (kWh)		153,057,245	150,689,844	147,616,622	144,543,401	141,470,179	
Class 2 EEC Rate (¢/kWh)2		0.334	0.462	0.591	0.569	0.580	
Current Class 2 Rate (¢/kWh):	**Base Rate**[3]						
5 kW Demand 1,000 kWh Monthly Use	19.921	20.123	20.251	20.380	20.358	20.369	***REVISED***
25 kW Demand 10,000 kWh Monthly Use	16.148	16.350	16.478	16.607	16.585	16.596	***REVISED***
Cumulative Rate Impact:							
5 kW Demand 1,000 kWh Monthly Use		1.01%	1.66%	2.30%	2.19%	2.25%	***REVISED***
25 kW Demand 10,000 kWh Monthly Use		1.25%	2.04%	2.84%	2.71%	2.77%	***REVISED***
Average EEC charge per Monthly Class 2 Bill		$4.69	$6.40	$8.02	$7.56	$7.55	

Class 3 - Non-Residential (Rate Schedules LP and HTP)

Plan Year		**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	
Program Cost - Class 3[1]		$203,992	$243,364	$230,978	$217,622	$217,297	
Declining Projected Class 3 Usage (kWh)		288,116,601	286,758,946	285,401,292	284,043,637	282,685,982	
Class 3 EEC Rate (¢/kWh)[2]		0.075	0.090	0.086	0.081	0.082	
Current Class 3 Rate (¢/kWh):	**Base Rate**[3]						
500 kW Demand 200,000 kWh Monthly Use	11.701	11.573	11.588	11.584	11.579	11.580	***REVISED***
Cumulative Rate Impact:							
500 kW Demand 200,000 kWh Monthly Use		-1.09%	-0.97%	-1.00%	-1.04%	-1.03%	***REVISED***
Average EEC charge per Monthly Class 3 Bill		$80.57	$96.12	$91.22	$85.95	$85.82	

Footnotes:

[1] Administrative costs, including the costs associated with the preparation and obtaining Commission approval of the EEC Plan, are allocated between EEC classes based on projected incentive spending.

[2] Includes 5.9% applicable to Gross Receipts Tax.

[3] Total rate as of October 1, 2023.

REVISED

EXHIBIT RDK-3

RDK ELECTRONIC WORKPAPERS

RDK WP1 Phase III Summary Statistics

RDK WP2 C&I Summary Stats

RDK WP3 HIGHLY CONFIDENTIAL Phase III SIC Code**

RDK WP4 HIGHLY CONFIDENTIAL Project Forecast v Actual**

RDK WP5 Bill Impact Calculations

RDK WP6 EEC Charge History

RDK WP7 Phase IV C&I Detail by Class and Pathway

***** Workpapers will be served electronically in excel format simultaneous to email service of Direct Testimony*****

**These Electronic Workpapers are HIGHLY CONFIDENTIAL; therefore, are available upon request via email to Steven C. Gray, sgray@pa.gov.

BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

Petition of UGI Utilities Inc. – Electric Division for Approval of Phase IV of its Energy Efficiency And Conservation Plan	:	**Docket No. M-2023-3043230**

VERIFICATION

I, Robert D. Knecht, hereby state that the facts set forth in my Direct Testimony and Exhibit, labelled OSBA Statement No. 1, with Exhibits RDK-1, RDK-2 and RDK-3, are true and correct to the best of my knowledge, information, and belief, and that I expect to be able to prove the same at a hearing held in this matter. I understand that the statements herein are made subject to the penalties of 19 Pa. C.S. § 4904 (relating to unsworn falsification to authorities).

Date: December 1, 2023

Robert D. Knecht

BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

Petition of UGI Utilities, Inc. – Electric Division for Approval of Phase IV of its Energy Efficiency and Conservation Plan	**:**	**Docket No. M-2023-3043230**

CERTIFICATE OF SERVICE

I hereby certify that true and correct copies of the foregoing have been served via email (*unless otherwise noted below*) upon the following persons, in accordance with the requirements of 52 Pa. Code § 1.54 (relating to service by a participant).

The Honorable Mark A. Hoyer
Administrative Law Judge
Pennsylvania Public Utility Commission
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DATE: December 1, 2023

/s/ Steven C. Gray
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COMMONWEALTH OF PENNSYLVANIA

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December 1, 2023

Via Electronic Mail Only
The Honorable Mark A. Hoyer
Deputy Chief Administrative Law Judge
PA Public Utility Commission
Office of Administrative Law Judge
301 Fifth Avenue
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Re: Petition of UGI Utilities, Inc. – Electric Division for Approval of Phase IV of its Energy Efficiency and Conservation Plan.
Docket No. M-2023-3043230

Dear Judge Hoyer and Counsel of Record:

Enclosed please find a copy of the Direct Testimony being submitted on behalf of the Office of Consumer Advocate in the above-referenced proceeding, as follows:

OCA Statement 1: Direct Testimony of Stacy Sherwood
(Public and CONFIDENTIAL Versions)

Please note that the **CONFIDENTIAL VERSION** of OCA Statement 1 will only be provided to the parties who have executed a Stipulated Protective Agreement to receive confidential material as indicated on the enclosed Certificate of Service

Copies have been served as indicated on the enclosed Certificate of Service,

Respectfully submitted,

/s/ Melanie J. El Atieh
Melanie J. El Atieh
Senior Assistant Consumer Advocate
PA Attorney I.D. # 209323
MElAtieh@paoca.org

Enclosures:
cc: PUC Secretary Rosemary Chiavetta, (Letter and Certificate of Service only)
Certificate of Service
*4862-9404-6612

CERTIFICATE OF SERVICE

Petition of UGI Utilities, Inc. – Electric Division for Approval of Phase IV of its Energy Efficiency and Conservation Plan	: : :	Docket No. M-2023-3043230

I hereby certify that I have this day served a true copy of the following documents, the Office of Consumer Advocate's Direct Testimony as follows: OCA Statement 1: Direct Testimony of Stacy Sherwood **(Public and CONFIDENTIAL Versions)** upon parties of record in this proceeding in accordance with the requirements of 52 Pa. Code § 1.54 (relating to service by a participant), in the manner and upon the persons listed below:

Dated this 1st day of December 2023.

Receiving the CONFIDENTIAL Version of OCA Statement 1

SERVICE BY E-MAIL ONLY

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OCA St. 1

BEFORE THE

PENNSYLVANIA PUBLIC UTILITY COMMISSION

PETITION OF UGI UTILITIES, INC. - ELECTRIC DIVISION FOR APPROVAL OF PHASE IV OF ITS ENERGY EFFICIENCY AND CONSERVATION PLAN	**)** **)** **)** **)** **)**	**DOCKET NO. M-2023-3043230**

Public Version

DIRECT TESTIMONY

OF

STACY L. SHERWOOD

ON BEHALF OF
PENNSYLVANIA OFFICE OF CONSUMER ADVOCATE

December 1, 2023

TABLE OF CONTENTS

I. INTRODUCTION

Q. WOULD YOU PLEASE STATE YOUR NAME AND BUSINESS ADDRESS?

A. My name is Stacy L. Sherwood. I am a Managing Consultant with Energy Futures Group ("EFG"). Our office is located at 10298 Route 116, Hinesburg, Vermont 05461. EFG provides expert consulting services in the design and evaluation of programs and policies that promote investments in efficiency, renewable energy, distributed resources, and strategic electrification.

Q. ON WHOSE BEHALF ARE YOU APPEARING?

A. I am presenting testimony on behalf of the Pennsylvania Office of Consumer Advocate ("OCA").

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?

A. On September 21, 2023, UGI Utilities, Inc. – Electric Division ("UGI" or "Company") voluntarily filed a *Petition of UGI Utilities Inc. – Electric Division for Approval of Phase IV of its Energy Efficiency and Conservation Plan* ("Plan"). EFG was retained by the OCA to assist in the review of UGI's Plan. I will address the cost-effectiveness, deemed savings assumptions, the Plan's compliance with the December 23, 2009 Secretarial Letter in Docket No. M-2009-2142851 regarding voluntary energy efficiency and conservation ("EE&C") programs, and the reasonableness of the overall Plan.

Q. PLEASE DESCRIBE YOUR QUALIFICATIONS, WORK EXPERIENCE, AND EDUCATIONAL BACKGROUND.

A. I have 15 years of experience in the energy sector, related specifically to the review and development of energy efficiency and demand response programs, as well as experience with automated metering infrastructure, cryptocurrency,

and revenue requirements. I have reviewed electric and natural gas efficiency programs in Arkansas, Connecticut, Iowa, Kentucky, Maryland, Ontario, and Pennsylvania. I hold a Bachelor's Degree in Accounting, Business, and Economics from McDaniel College. My qualifications are summarized in my resume provided in Attachment A.

Q. HAVE YOU PREVIOUSLY TESTIFIED IN REGULATORY PROCEEDINGS ON UTILITY ISSUES?

A. Yes. On behalf of the OCA, I have testified regarding the UGI Utilities, Inc.'s Phase II and III Energy Efficiency and Conservation Plan, Docket Nos. M-2015-2477174 and M-2018-3004144. I also have testified in numerous other cases before the Commission and other state commissions, listed in my resume.

Q. HAVE YOU REVIEWED THE PHASE IV PLAN?

A. Yes. I have reviewed the material filed in the Company's Plan, including the Direct Testimony of Theodore M. Love and the Direct Testimony of Kimberly M. Bassininsky. I have also reviewed the Company's responses to the Office of Small Business Advocate ("OSBA") Interrogatory Set I and the OCA's Interrogatory Set I.

Q. PLEASE DESCRIBE THE MAIN COMPONENTS OF THE COMPANY'S PLAN.

A. UGI's Plan includes six efficiency programs designed to reduce energy consumption by 32,723 MWh over the five-year Plan and a Community Based Organization ("CBO") Marketing Program that will not directly result in savings. Overall, the Plan will cost $10.5 million over the five years, which is

equivalent to spending 2% of UGI's 2008 revenue, with annual budgets ranging from $1.8 million to $2.3 million.

The majority of the Plan's programs are a continuation of Phase III programs; however, the Company proposed some changes, including elimination of the Energy-Efficient Lighting Program, adding energy efficiency kits outside of the School Energy Education program, and expanded the Custom commercial and industrial program to include a prescriptive pathway and a direct install for small business pathway. The programs that are continuing include: Appliance Recycling, Appliance Rebate, School Energy Education, Residential Low-Income Program, and the CBO Marketing Program.

The Company has proposed a three percent total electric consumption reduction target for Phase IV, for a total of 32,723 MWh. Of the $10.5 million projected for the five-year Plan, 46% is allocated for customer incentives, which serves as a pass through to customers. The remaining 54% is allocated between administration (46%) and marketing (8%). The breakdown of the total estimated savings and total costs/spending among rate classes as proposed by the Company is provided in Table 1.

Table 1 Phase IV Total Projected Energy Savings by Customer Class

Customer Class	Total Projected First Year Savings (MWh)	Percent of Total MWh Savings	Total Spending	Percent of Total Spending
Residential	12,919	39%	$5,855,791	56%
Small Commercial	13,292	41%	$3,503,614	33%
Large Commercial	6,511	20%	$1,113,254	11%
Total	**32,723**	**100%**	**$10,472,658**	**100%**

Q. PLEASE SUMMARIZE YOUR FINDINGS AND RECOMMENDATIONS.

A. Based on the results of my review and analysis, I have reached the following conclusions and recommendations:

- The Company's Plan overly relies on energy efficiency kits. The Company has a history of providing kits to consumers, which could mean a high potential for saturation, which is accompanied by the kit having measures with low in-service rates. Furthermore, the Company's savings projections are not realistic when compared to historical performance for measures offered under the Appliance Rebate Program and the Low-Income Program.
- The Commission should not approve the Plan as proposed given the Company's overreliance on kits and unrealistic projections; or in the alternative, the Commission should direct the Company to evaluate the inclusion of a weatherization audit and rebate program that includes air sealing, duct sealing, and insulation. If the Company disagrees with my recommendation to adopt these alternative measures, the Company should address in rebuttal testimony the alternative measures that it would support. Additionally, should the Company want to continue offering the programs as proposed, it should justify the continuation of kits, provide evidence/support on how it will achieve the forecasted higher participation levels of the Appliance Rebate Program and the Low-Income Program, and provide justification for the decreased program administration costs from historical levels.

- The Company should discontinue offering natural gas efficiency measures to promote electric to natural gas fuel switching. The Commission should not approve the Plan with fuel switching measures that move customers away from electricity to natural gas; or in the alternative, the Commission should disallow fuel switching measures as part of the Plan approval.
- The Company should encourage customers to consider weatherization measures, particularly those seeking heating, ventilation, and air conditioning ("HVAC") upgrades, regardless of whether the program offers weatherization rebates or audits to promote proper sizing of HVAC equipment.
    - Promotion of weatherization should be provided via marketing materials, including the website and the rebate application.
    - Provide contractor training on the importance of properly sizing equipment and promoting weatherization to occur prior to the installation of HVAC equipment. Encourage contractors to convey this information to participants as part of the sales pitch for the HVAC equipment.
    - Consider providing an incentive to contractors when they ensure that weatherization occurs prior to the installation of the rebated HVAC equipment.
- As part of Plan approval, the Commission should direct the Company to evaluate whether its Appliance Rebate Program measures meet the eligibility requirements of the Inflation Reduction Act ("IRA"). If the measures meet the IRA requirements, the Company should be directed to

notify participants through its website and any marketing and rebate materials that they are eligible to receive IRA tax credits or rebates. Similarly, the Company should be directed to identify those measures that do not meet the IRA eligibility requirements and be directed to notify participants that they are not eligible to receive tax credits or rebates for such measures.

- The Commission should direct the Company to provide a sensitivity analysis of its Plan to reflect historical participation and spending levels, as well as the potential popularity of electrification measure as an impact of IRA funding. The sensitivity analysis should indicate the impact on cost, savings, program cost-effectiveness, and overall portfolio cost-effectiveness.
- The Commission should direct the Company to highlight ways that it plans to achieve the forecasted participation, with specific language on how it plans to expand program eligibility to address low-income and disadvantaged customers within its service territory.
    - The Company should consider offering a more comprehensive program for these customers, such as offering weatherization measures, and/or expand the measure offering to include heat pumps (either central or ductless) for homes with resistance heating. If the Company addresses these issues in rebuttal, it will give the OCA an opportunity to further review and consider the Company's proposals.
- Should the Company opt to offer a voluntary Phase V Plan, to inform the development of such a Phase V Plan, the Commission should require that

the Company evaluate actual Plan IV results to assess the effectiveness of the programs using the formal evaluation, measurement and verification ("EM&V") process and require the Company to file with the Commission in this docket a final annual report like that filed by the Act 129 EDCs, but only once per plan term. For program evaluations conducted to date, these should be provided and filed as part of its annual program year result filings.[1] To reduce costs, I recommend that the evaluation be conducted on a predetermined cycle; specifically, the first two years of the Phase IV programs should be conducted in time for the results to inform the Phase V plan development.

Q. HOW IS THE REMAINDER OF YOUR TESTIMONY ORGANIZED?

A. Following this introductory section, my testimony is divided into six sections: Phase IV Plan Compliance, Plan Uncertainties, Appliance Rebate Program, Energy Efficiency Kits, Low-Income Program, and Conclusions.

II. PHASE IV PLAN COMPLIANCE

Q. DOES THE PLAN MEET THE REQUIREMENTS OF THE SECRETARIAL LETTER REGARDING VOLUNTARY EE&C PROGRAMS?

A. Yes. As proposed by the Company, the Plan meets the basic elements of the following requirements:

1. The Company provided a detailed implementation plan with a description of EE&C measures and incentives to be offered.

[1] In Attachment OSBA-1-1.1, there is a reference to AEG Evaluation for PY10 provided for the School Energy Program measures.

2. The Company provided sufficient supporting documentation for each of the programs, including both verified statements and testimony.

3. The Company proposed energy consumption or peak demand reduction objectives, or both, with proposed dates on which the objectives are to be met.

4. The Company provided a budget showing total planned expenditures by both program and customer class.

5. The Company filed tariffs and a Section 1307 cost recovery mechanism to annually reconcile actual expenses with actual annual revenues; and

6. A description of the method for monitoring or verifying plan results.

While the sixth requirement is met through the application of TRM to program assumptions, the Company appears to perform an evaluation for its School Energy Program but does not discuss the method for verifying results nor does it file that evaluation with its annual results or in the associated plan docket. Additionally, although not mandated by the Commission, the Plan considers the large electric distribution companies' ("EDCs") Act 129 Phase IV EE&C plans, along with Phase IV Commission implementation orders.[2]

Going forward, to fully meet the sixth requirement, the Company should file any evaluations performed on a program and include as part of its plan the description of the evaluation if that evaluation will be utilized in lieu of the TRM. Additionally, as addressed later in this section, the Company should conduct a form evaluation once per plan period, on a schedule that will inform the next EE&C phase.

Q. HAVE YOU DETERMINED THE COMPANY'S PLAN TO BE REASONABLE, COST-EFFECTIVE, AND BENEFICIAL TO CONSUMERS?

[2] The Phase IV Commission implementation orders were entered on June 18, 2020, in Docket No. M-2020-3015228.

A. It is cost effective and beneficial, but I suggest revisions in order to ensure that it is reasonable. Given that the Company is proposing to implement EE&C measures to benefit ratepayers using ratepayer dollars, I examined the features of the programs to identify whether the Plan includes accessible, cost-effective program options for all ratepayers that offer a return on investment to ratepayers. Additionally, I reviewed the assumptions and forecasts to evaluate against past performance and to determine the adherence to the Technical Reference Manual.[3] As proposed by the Company, the Plan affords ratepayers the opportunity to participate in at least one program, with the offering of a dedicated Low-Income Program and the Small Business pathway. After comparing the Plan to UGI Electric's historical EE&C achievements, adjustments are needed to the forecasted level of savings and costs for the Plan to be reasonable. The recommended adjustments, as noted throughout this testimony, should be made by the Company in a way that still produces a cost-effective Plan that is beneficial to customers. These concerns and subsequent recommendations are provided in this testimony.

Q. PLEASE DESCRIBE THE PLAN'S COST-EFFECTIVENESS.

A. The overall portfolio, as well as individual sector portfolios, are projected to be cost-effective. A total resource cost ("TRC") ratio above 1.0 indicates that the program provides benefits that exceed the costs invested in the program, indicating that ratepayers, including non-participants, receive a return on the investment in energy efficiency. As presented by the Company, the Plan is projected to be cost-effective, with a TRC of 2.24 over the five-year period. The Plan's programs are also projected to be cost-effective when considered

[3] Technical Reference Manual Issued August 2019 and Revised February 2021.

by sector, with a TRC of 2.92 for the residential portfolio and a TRC of 2.18 for the commercial and industrial portfolio.

Q. DO YOU HAVE ANY CONCERNS REGARDING THE PROJECTED COST-EFFECTIVENESS OF THE PORTFOLIO?

A. Yes. As discussed further down in my testimony in Section IV – Appliance Rebate Program, the Company's participation forecasts appear to optimistic, which adds a level of risk to the Plan because if the forecasted participation is not achieved, it may result in a lower overall TRC for the Plan. Lower-than-anticipated participation levels increase the amount of administration, overhead, and shared costs per project, which in turn would decrease the cost-effectiveness of a program, a sector, and the overall Plan. Given Phase III participation trends, discussing in Section IV, I have concerns about the Company's ability to achieve the forecasted participation levels.

The in-service rates between the efficiency kit offerings vary by program, but in both cases the rates are less than half, which indicates that the Company is spending money on measures that are never utilized. This concern is discussed further in Section V- Energy Efficiency Kits.

Additionally, the Company is forecasting lower Administration costs and higher Customer Incentive allocations for the Plan than compared to historical spending trends. Since Program Year ("PY") 9, the customer incentives have declined from 39% of the spending to 36% in PY11, while at the same time, Administration costs have increased from 58% to 60%. The actual spending on Administration costs is significantly higher than projected, at an average 46% projection across the Plan (shown in Table 2, with actual results shown in gray). The higher Administration cost ratio is likely due to lower than

forecasted participation levels. Based on historical trends, it seems unlikely that the programs will be able to achieve the incentives vs non-incentive ratios projected by the Company for the Plan, particularly if the participation rate trends from Phase III continue. As part of the rebuttal, the Company should indicate how it plans to increase the level of customer incentives spent per year or revise its projections to reflect historical performance.

Table 2 Annual Plan Costs, Actual and Projected

	PY 8	PY 9	PY 10	PY 11	PY 13	PY 14	PY 15	PY 16	PY 17
	Actual				Projected				
Customer Incentives	43%	39%	38%	36%	43%	43%	45%	48%	48%
Marketing	3%	3%	5%	4%	10%	8%	7%	8%	8%
Administration	54%	58%	57%	60%	47%	49%	48%	44%	44%

While the Company is currently forecasting the Plan to be cost-effective, changes to participation, spending, and in-service rates could negatively impact the Plan enough to render it not cost-effective.

Q. HOW IS THE EFFECTIVENESS OF THE COMPANY'S PLAN EVALUATED?

A. Since the Company has less than 100,000 total customers, the Plan's portfolio of programs is exempt from the requirement of a final annual report using the EM&V process[4] like the Act 129 EDCs. Voluntary EE&C plans must measure

[4] As described on the Commission's website, the Act 129 EDCs must file semiannual and final annual reports, which provide the EDCs' reported savings for that program year. The final annual reports provide verified savings for each EDC's EE&C portfolio for that program year, the cost-effectiveness evaluation based on the TRC test, the process evaluation, as well as items required by Act 129 and Commission orders. The Commission required that all semiannual and final annual reports be filed with the Commission's Secretary's Bureau and the Act 129 Statewide Evaluator. Additionally, each EDC has provided a link to its own website where these reports can also be found. *See* https://www.puc.pa.gov/filing-resources/issues-laws-regulations/act-129/electric-distribution-company-act-129-reporting/.

and verify savings based upon the TRM and the TRC test, as approved by the Commission.[5] In my review of UGI's annual program year results, I found there to be a lack of discussion regarding the verification of measure installs and in-service rates for the UGI service territory. Additionally, the Plan model refers to an evaluation of the School Energy Program but the Plan itself does not provide any discussion of the evaluation.

Without a formal evaluation using the EM&V process to verify the savings, the effectiveness of the programs is unclear. For instance, the reported energy savings may be over- or under-reported due to installation rate or usage assumptions. Additionally, there is no assessment of the program's free riders, which could indicate the necessity to discontinue certain programs or implement new measures.

Q. DO YOU RECOMMEND THAT THE PLAN BE SUBJECT TO AN EVALUATION?

A. Yes. To determine the effectiveness of the Plan and use of ratepayer dollars, I recommend that the Plan be subject to a formal EM&V process and the Company file with the Commission in this docket a final annual report like that filed by the Act 129 EDCs, once per plan term. However, in recognition that the EM&V process can be costly, I would recommend that the evaluation be performed on a predetermined cycle. My recommendation is that an evaluation of the first two years of the Phase IV programs be conducted in time for the results to inform the Phase V plan development. Therefore, under my recommendation, UGI Electric would file its annual program year results as it has been doing to date, as well as filing an EM&V report once per plan term.

[5] The December 23, 2009 Secretarial Letter in Docket No. M-2009-2142851, p 1-2.

Q. ARE THERE ENERGY EFFICIENCY MEASURES ABSENT FROM THE PROPOSED PLAN THAT ARE COMMONLY FOUND IN UTILITY ENERGY EFFICIENCY PLANS?

A. Yes. The limited measure offerings do not provide a comprehensive suite of programs for residential customers. The Company's suite of residential programs primarily revolves around appliance measures, in addition to the self-install kits measures, whereas other utilities do offer such rebates, most utility energy efficiency programs also include comprehensive measures, such as in-home audits, air sealing, and attic insulation. Comprehensive measures tend to be costly and more time-consuming than rebating an appliance; however, those measures may provide deeper energy savings and increased comfort, and those program incentives can motivate customers to initiate "invisible" projects, such as envelope measures, that otherwise may not be considered. The suite of residential programs does not offer any comprehensive measures to allow for whole home efficiency, like weatherization. The Company states that this is due to the "historical difficulty of meeting cost-effectiveness requirements for electric-only program…in market-rate programs in Pennsylvania."[6] While this may have historically been the case, there are cost-effective program designs throughout the country that should be considered, particularly given the importance of weatherization measures under the IRA initiative. This is discussed further in Section IV.

Q. HAVE YOU REVIEWED THE COMPANY'S PROPOSED PHASE IV EEC RIDER?

[6] Company response to OCA Set I-7a.

A. Yes. I have reviewed the proposed recovery method for the Plan's development, administrative, and program costs. The Company plans to allocate the costs among residential, small commercial and large commercial customers, as well as customers that receive service under Rate Schedules LP and HTP. There is no apparent subsidization between customer classes, as the Company recovers costs in proportion to the costs expended by each customer class. Common costs are assessed based upon the proportion of incentive spending for each customer class. The costs would be recovered over a five-year period, with a subsequent sixth year to allow for the true-up of any under- or over-collections. I do not see any issues with the Company's proposed recovery method. If costs are changed as a result of the Commission adopting my recommendations, those changes should be reflected in the calculation to allocate common costs and the Phase IV Rider.

III. PLAN UNCERTAINTIES

Q. WHAT ARE THE TWO UNCERTAINTIES THAT THE COMPANY OUTLINED AS PART OF ITS FILING?

A. The Company indicated that the Inflation Reduction Act of 2022 rebates and tax credits, as well as the Phase V EDC Plan Filings and supporting documents, such as the TRM and TRC Test Order, may have an impact on the Phase IV Plan success. The latter concern is how those changes may impact UGI Electric's Phase IV Plan filing discussed in this proceeding.

Q. WHY IS THE COMPANY CONCERNED ABOUT THE IRA?

A. As established through the IRA, there are tax credits currently available for residential, commercial, and industrial customers that invest in and install

energy efficient electrification, including heat pumps and weatherization, in their homes and businesses. Additionally, the IRA has allocated to states funding for electrification rebates that will roll out during the Plan period. The Company indicates that it will monitor how Pennsylvania rolls out the IRA rebates for energy efficient equipment to see how it may interact or overlap with the program offerings.

Q. DO YOU HAVE ANY RECOMMENDATIONS RELATED TO THE IRA REBATES AND TAX CREDITS?

A. Yes. There are two things the Company should be aware of when evaluating its program offerings to the IRA offerings. First, the Company should identify which of its measures meets the eligibility requirements of the IRA. There are certain efficiency requirements to qualify for the tax credit and/or the rebate. If any measures are less efficient that the IRA requirements, UGI should decide if it makes sense to increase the efficiency requirements for its measures offerings to match the IRA, or if that is too costly, it should explicitly state whether a measure meets IRA eligibility or not for customer clarity, on both its website and any marketing and rebate materials. Second, if the Company is going to participate as part of Pennsylvania's IRA implementation, it will require significant documentation and monitoring. At this time, it is unclear how Pennsylvania will roll out the rebates. However, the IRA prohibits rebate recipients from receiving rebates for more than the cost of the measure, which would require UGI to adjust its rebate level if it is stacked with IRA funding resources. UGI would be required to monitor the amount of rebate it provides to its participants that also receive IRA rebates. Additionally, the reporting requirements on program participation appear extensive and will likely require

more administrative funds to cover activities related to IRA if it is stacked with the UGI rebates. To decrease the administrative burden if the IRA rebates are delivered through the EDCs, it may make sense for UGI to partner with one of the EDCs for processing and documentation to lower impact to the program.

Q. DO YOU HAVE CONCERNS ABOUT THE PHASE V PLAN FILINGS FROM THE EDCS?

A. No. In Pennsylvania, the TRM and TRC Test documents are prospective and incorporated as part of the planning process. At the time that UGI is submitting its Phase IV Plan, the documents that are available are those associated with the Phase IV Plans. Barring any significant differences, the Phase V TRM and TRC Test documents should not have material impacts to the UGI Phase IV Plan. Furthermore, if the Company is concerned about staying on the same track, it could adjust its Plan schedule to follow a year behind the approval of the Act 129 plans to incorporate the updated and revised TRM and TRC Test documents and Commission rulings. This can be accomplished by either extending the current Phase an additional 2 years or have a short Phase IV Plan term.

IV. APPLIANCE REBATE PROGRAM

Q. DESCRIBE THE APPLIANCE REBATE PROGRAM.

A. The Plan outlines the Appliance Rebate Program, which offers homeowners and tenants with the ability to purchase high-efficiency or ENERGY STAR rated equipment, ranging from room air conditioners and clothes washers to central air conditioners and air source heat pumps. In addition to the efficient electric equipment, the program offers natural gas central heat, water heaters,

and clothes dryers for those that switch from electric equipment. The rebates range from $25 to $1,500, depending upon the measure. To qualify for the rebate, applications must be submitted within 180 days of the measure's installation date.

Q. DO YOU HAVE CONCERNS WITH THE PROGRAM?

A. Yes, I have several concerns, including:

- Participation forecasts are higher than achieved in prior phases for continued measures.
- There may be a higher uptick on HVAC appliances with the emphasis from the IRA.
- Fuel switching measures should not be part of the program.
- Lack of weatherization measures could result in the oversizing of HVAC equipment.

Below, I discuss each of these concerns and subsequent recommendations.

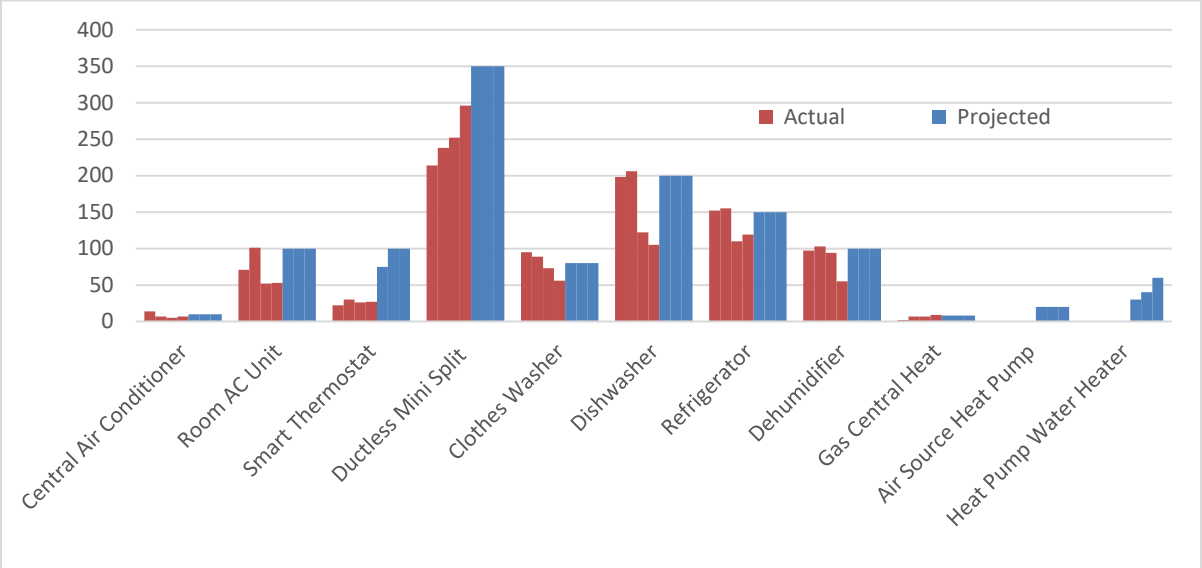
Q. WHY ARE YOU CONCERNED ABOUT THE APPLIANCE REBATE PROGRAM'S FORECASTED PARTICIPATION FOR PHASE IV?

A. Consistent with prior phases, UGI is forecasting participation for several of its measures to be significantly higher than what has historically been achieved. Figure 1 provides the comparison between the actual rebate levels from PY 8 through 11 (shown in red) compared to the forecasted participation from PY 13 through PY 15 (shown in blue).[7] As shown, the room air conditioner is double historical achievements, while smart thermostats are 3-4 times higher. Additionally, ductless mini-splits, dishwasher, and refrigerator rebate participation is significantly higher than what has been achieved in the past

[7] After PY 15, the level of participation remains the same for each measure through PY 17.

two or more program years. While there is some rebound impact from Covid-19 that could have hindered program performance during the time represented, the report for PY11 does not mention any barriers to achieving forecasted levels.

Figure 1 Appliance Rebate Program Rebates Actual Compared to Forecasted



If the program performs close to historical projections for those measures identified, it will result in lower savings than forecasted by the Company. If measures promoted under the IRA rebates and tax credits, such as an air source heat pumps, gain in popularity over its minimally forecasted levels, it could significantly impact the budget as the incentive ranges from $400-$800. It is unclear what the impact would be on the cost-effectiveness of the program or the overall portfolio.

Q. WHY DO YOU OPPOSE FUEL SWITCHING MEASURES IN THE ELECTRIC PORTFOLIO?

A. First, there is no basis for utilizing electric ratepayer dollars to fund conversion from electric to natural gas measures, particularly in a voluntary electric EE&C

program. Second, incentivizing electric to natural gas fuel switching contradicts the effort of the IRA to support and incentivize electrification. Rather than focusing on fuel switching measures, the Company could achieve significant savings by providing higher incentives to customers with electric resistance heating, such as baseboard heating, to adopt a mini-split heat pump or central heat pump system. In other states, such as Connecticut and Massachusetts, customers receive an incentive adder when they switch their heating from inefficient baseboards to a heat pump.[8] Whether or not UGI provides an incentive adder, it should not rebate natural gas measures as part of this electric program.

Q. WHY MAY HVAC EQUIPMENT BE OVERSIZED?

A. The Department of Energy ("DOE") strongly recommends that homes receive weatherization, including air sealing, duct sealing, and insulation, prior to any mechanical upgrades.[9] Tightening the building envelope improves overall home efficiency and comfort, as well as can identify health and safety issues such as mold. If a HVAC unit is sized prior to the installation of weatherization measures, it can result in an oversizing of the unit, which may result in a higher cost due to additional tonnage. If weatherization is addressed after the installation of HVAC equipment, then it could result in the unit not performing optimally due to the unit not being sized for the home's air leakage.

Q. DOES THE UGI PLAN ADDRESS WEATHERIZATION?

[8] In Connecticut, customers that replace their primary heating source that is oil, propane, or electric resistance with a heat pump are eligible to receive an energy optimization rebate of $1,000 per ton. https://energizect.com/rebates-incentives/heating-cooling/heat-pumps/residential-air-source

[9] Recommendations for Envelope-First, Heat Pump Ready Home Efficiency Rebate Programs, Department of Energy State & Community Energy Programs, https://www.energy.gov/sites/default/files/2023-08/Recommendations_for_%20Envelope_First_Heat_Pump_Ready_Home_Efficiency_Rebate_Programs.pdf.

A. No, the Plan does not include any weatherization measures. The program does not offer any direct installation, rebate, or weatherization measures as part of its energy efficiency kits. Furthermore, in a review of the UGI electric website, the Company fails to inform its customers of the benefits of weatherization or suggest that it should be completed prior to the adoption of new HVAC equipment.

Q. WHAT ARE YOUR RECOMMENDATIONS FOR THE APPLIANCE PROGRAM?

A. The Appliance Rebate Program accounts for 58% of the residential portfolio's savings and 23% of the overall portfolio. The success of this program is critical because of the level of savings compared to entire Plan and projected program cost-effectiveness ratio of 3.13, which contributes to the overall Plan cost-effectiveness by offsetting programs with TRCs. The Company should run a sensitivity analysis to determine how historical levels of participation and increasing interest in electrification measures may impact the program's costs and cost-effectiveness.

If UGI plans to not include weatherization measures as part of its Plan, then it should at a minimum educate its customers on the importance of weatherization and having it performed prior to the installation of mechanical equipment. The IRA will offer rebates for weatherization measures. The Company should promote the use of those rebates to address weatherization efforts.

If UGI does not remove the natural gas equipment incentives from the program, the Commission should disallow any fuel switching incentives as part of the voluntary Plan proposal.

V. ENERGY EFFCIENCY KITS

Q. PLEASE SUMMARIZE THE PROGRAMS THAT WILL OFFER ENERGY EFFICIENCY KITS.

A. The Plan will offer two versions of the energy efficiency kits, one kit is designed to be delivered to students through the School Energy Education Program and the other kit will be provided to residential customers who heat their water with electricity through the Energy Kits Program. The School Energy Education Program kit includes:

- Low Flow Showerhead
- Low Flow Aerator (kitchen)
- Low Flow Aerator (Bathroom)
- Instructions for water heater setback
- Furnace Whistle
- Smart Strip (Tier 2)
- ENERGY STAR LED

The Energy Kits Program kit includes:

- Low Flow Showerhead
- Low Flow Aerator (kitchen)
- Low Flow Aerator (Bathroom)

The latter kit is focused only on water saving measures and therefore costs less to assemble and deliver than the school kit programs.

Q. DO YOU HAVE CONCERNS WITH THE KITS BEING OFFERED?

A. Yes. My primary concern is that the Plan is heavily reliant on kits that have low in-service rates, which means that most of the measures funded through the program are never utilized. The in-service rate indicates the percentage of

measures that are truly installed. In reviewing the level of savings assumed for each measure and the overall program, the School Energy Program and Energy Kits Program offer the same water saving measures but have different in-service rates. The School Energy Kits reflect PY10 and PY11 program experience in-service rates, while the Energy Efficiency Kits utilize the in-service value in the TRM, which are lower than program experience, as shown in Table 3.

[BEGIN CONFIDENTIAL]

[END CONFIDENTIAL]

It is unclear what type of verification/evaluation was conducted to determine in-service rates for the School Energy Kit as the evaluation report has not been filed or discussed as part of the Plan filing. The Company indicates that the School Energy program expected that all students take home their kit and if they cannot utilize the measures that they should share it with a neighbor or relative that live nearby, while also marking the kit installed.[10] Extra kits left behind are to be given by the teacher to do an adult that will be responsible for completing the Home Energy Worksheet. This is not a proper evaluation of the installation rate, as there is potential for measures to be installed outside of the service territory or not installed at all but still marked as installed. Even if installed, the longevity of the measure within the customer's home is uncertain as it could be removed due to low satisfaction with the measure or for other

[10] Company response to OCA Set I-17.

reasons. Unless the Company can provide a better method to verify the installation rates, it should utilize the TRM's in-service rates.

Regardless of which in-service rate is used, if it is assumed that at a minimum 50% of the measures are not installed under the two programs, that would mean that approximately $850,000 of the two programs budgets fund measures that are not utilized and providing energy savings.[11] This does not appear to be a reasonable use of ratepayer funds, particularly given that the in-service rates are lower than 50% meaning the cost is higher than discussed in this example.

My second concern is that the Plan seems to focus on secondary methods to achieve electric energy savings, such as through water saving measures and fuel switching. In particular, the Plan is heavily reliant on energy efficiency kits, with 21% of the residential energy savings projected to come through the two kit programs. While there are energy savings associated with water savings, it is not a deep, long-term energy savings measures, such as weatherization measures or rebating electrification measures like HVAC equipment which can last from 15-25 years depending on the measure.

Third, I am concerned about the saturation level of the energy efficiency kit offerings, given the program's longevity and the number of households within the service territory. The kits are going to be implemented for an additional five years, on top of the 12 years that it has already been offered. In response to OCA Set I-17, the Company indicates that a customer account will be restricted to one kit per customer account every five years. Given the lifetimes for the measures in the kit ranging from 9-10 years, it would seem that offering the kit every five years ignores that the original measures delivered would still

[11] There is one measure in the School Energy Program kit that has an in-service rate above 50%. This analysis was used for simplicity purposes, given that a majority of the in-service rates are lower than 50%.

be usable if they were installed from the first kit. If the Company wants to continue offering kits, under the Efficiency Kit Program, it should be limited to one kit per account every 10 years.

Alternatively, the Company should explore additional measures and programs to offer its customers outside of utilizing kits. There are significant delivery costs associated with both kit efforts. Those costs could be shifted to offset energy audit costs or weatherization rebates. As noted above, the Company should evaluate the potential benefits of offering a more comprehensive program, even if it addresses less customers, to capture the most savings through one program interaction, such as an audit and subsequent installation, rather than through efficiency kits. Program offerings that support the IRA initiatives should be considered, including weatherization and electrification measures.

VI. LOW-INCOME PROGRAM

Q. PLEASE DESCRIBE THE LOW-INCOME PROGRAM.

A. The Low-Income program offers two measures, an ENERGY STAR Smart Thermostat and an ENERGY STAR Heat Pump Water Heater. Over the five-year period, the Company plans to install 50 of each measure. The program is projected to be cost-effective, with a TRC ratio of 1.11. In PY 10 and 11, the Company has struggled to install the heat pump water heaters, with only one being installed in each program year.

Q. ARE YOU CONCERNED ABOUT THE LOW PARTICIPATION LEVELS?

A. Yes. The low forecasted participation levels are concerning, as low-income customers are paying into the program but have limited opportunities to

participate. The limited opportunities to participate are not only because of the participation levels, but also the measure offerings. Heat pump water heaters do not fit all homes, as they require more space than traditional electric water heaters and can require upgrades to accommodate the equipment.[12] The smart thermostats require a Wi-Fi connection, which cannot be guaranteed.

Q. DO YOU HAVE ANY RECOMMENDATIONS FOR THE LOW-INCOME PROGRAM?

A. Yes. Knowing that the Company has struggled to install these two measures in recent years, the Company should have explored other measures for inclusion and/or expanded its eligibility for the program. While the program relies on the Low-Income Usage Reduction Program participants, the small number of homes addressed annually indicates that program eligibility should be re-evaluated to potentially include offerings to non-LIURP customers, but that are also income-qualified, and perhaps not dependent on customer's usage (particularly a high-usage threshold).

It is vital for the energy efficiency programs, voluntary or required, to offer opportunities which allow for all ratepayers that pay into the program to participate. Furthermore, it is unclear how the prior phases have reached low-income and disadvantaged communities, both of which are targeted through the IRA program and the federal initiative Justice40. It is likely that the impact is limited based on historical performance of low-income efforts under this Plan.

[12] Electric water heaters require six inches of clearance on all sides, whereas heat pump water heaters required at least 1,000 cubic feet of air space around the unit and do not operate efficiently in cold spaces (below 40 degrees Fahrenheit).

As part of its rebuttal testimony, the Company should propose ways its plans to achieve the forecasted participation, consider offering additional or alternative measures and/or expand program eligibility to address low-income and disadvantaged customers within its service territory.

VII. CONCLUSIONS

Q. PLEASE PROVIDE A SUMMARY OF YOUR RECOMMENDATIONS FOR THE COMPANY'S PLAN.

A. I recommend that the following changes be made to the Plan:

A. Based on the results of my review and analysis, I have reached the following conclusions and recommendations:

- The Company's Plan overly relies on energy efficiency kits. The Company has a history of the Company providing kits to consumers, which could mean a high potential for saturation, which is accompanied by the kit having measures with low in-service rates. Furthermore, the Company's savings projections are not realistic when compared to historical performance for measures offered under the Appliance Rebate Program and the Low-Income Program.
- The Commission should not approve the Plan as proposed given the Company's overreliance on kits and unrealistic projections; or in the alternative, the Commission should direct the Company to evaluate the inclusion of a weatherization audit and rebate program that includes air sealing, duct sealing, and insulation. If the Company disagrees with my recommendation to adopt these alternative measures, the Company should address in rebuttal testimony the alternative measures that it would

support. Additionally, should the Company want to continue offering the programs as proposed, it should justify the continuation of kits, provide evidence/support on how it will achieve the forecasted higher participation levels of the Appliance Rebate Program and the Low-Income Program, and provide justification for the decreased program administration costs from historical levels.

- The Company should discontinue offering natural gas efficiency measures to promote electric to natural gas fuel switching. The Commission should not approve the Plan with fuel switching measures; or in the alternative, the Commission should disallow fuel switching measures as part of the Plan approval.
- The Company should encourage customers to consider weatherization measures, particularly those seeking HVAC upgrades, regardless of whether the program offers weatherization rebates or audits to promote proper sizing of HVAC equipment.
    - Promotion of weatherization should be provided via marketing materials, including the website and the rebate application.
    - Provide contractor training on the importance of properly sizing equipment and promoting weatherization to occur prior to the installation of HVAC equipment. Encourage contractors to convey this information to participants as part of the sales pitch for the HVAC equipment.

- Consider providing an incentive to contractors when they ensure that weatherization occurs prior to the installation of the rebated HVAC equipment.

- As part of Plan approval, the Commission should direct the Company to evaluate whether its Appliance Rebate Program measures meet the eligibility requirements of the Inflation Reduction Act ("IRA"). If the measures meet the IRA requirements, the Company should be directed to notify participants through its website and any marketing and rebate materials that they are eligible to receive IRA tax credits or rebates. Similarly, the Company should be directed to identify those measures that do not meet the IRA eligibility requirements and be directed to notify participants that they are not eligible to receive tax credits or rebates for such measures.
- The Commission should direct the Company to provide a sensitivity analysis of its Plan to reflect historical participation and spending levels, as well as the potential popularity of electrification measure as an impact of IRA funding. The sensitivity analysis should indicate the impact on cost, savings, program cost-effectiveness, and overall portfolio cost-effectiveness.
- The Commission should direct the Company to highlight ways that it plans to achieve the forecasted participation, with specific language on how it plans to expand program eligibility to address low-income and disadvantaged customers within its service territory.
    - The Company should consider offering a more comprehensive program for these customers, such as offering

weatherization measures, and/or expand the measure offering to include heat pumps (either central or ductless) for homes with resistance heating. If the Company addresses these issues in rebuttal, it will give the OCA an opportunity to further review and consider the Company's proposals.

- Should the Company opt to offer a voluntary Phase V Plan, to inform the development of such a Phase V Plan, the Commission should require that the Company evaluate actual Plan IV results to assess the effectiveness of the programs using the formal EM&V process and require the Company to file with the Commission in this docket a final annual report, like that filed by the Act 129 EDCs, but only once per plan term. For program evaluations conducted to date, these should be provided and filed as part of its annual plan filings.[13] To reduce costs, I recommend that the evaluation be conducted on a predetermined cycle; specifically, the first two years of the Phase IV programs should be conducted in time for the results to inform the Phase V plan development.

Q. WITH THE PROPOSED CHANGES YOU HAVE RECOMMENED, DO YOU BELIEVE THAT THE COMMISSION SHOULD APPROVE THE PLAN?

A. Yes.

Q. DOES THIS CONCLUDE YOUR DIRECT TESTIMONY?

A. Yes, it does.

[13] In Attachment OSBA-1-1.1, there is a reference to AEG Evaluation for PY10 provided for the School Energy Program measures.

ATTACHMENT A

QUALIFICATIONS OF
STACY L. SHERWOOD

Stacy Sherwood
Managing Consultant

ENERGY FUTURES GROUP

Professional Summary

Stacy Sherwood brings over a decade of experience in the energy industry, specializing in energy efficiency (EE), demand response (DR), automated metering infrastructure (AMI), cost recovery, and renewable energy. Stacy has testified or provided comments before the public service commissions of Louisiana and Maryland and the public utilities commissions of Pennsylvania and Rhode Island on AMI, EE, and reasonableness of revenue increases. Throughout her career, Stacy has evaluated various electric and natural gas EE and DR plans; potential studies; evaluation, measurement, and verification reports; and riders for cost recovery. In particular, she has specialized in the design of low-income EE programs in Arkansas, Maryland, and Pennsylvania. Ms. Sherwood has also testified in 14 cases related to the reasonableness of revenuer requirements in Pennsylvania and Rhode Island.

Experience

2021-present: Managing Consultant, Energy Futures Group, Hinesburg, VT

2015-2021: Senior Analyst, Exeter Associates, Inc., Columbia, MD

2013-2015: Assistant Director of Energy, Analysis, and Planning Division, Maryland Public Service Commission, Baltimore, MD

2011-2013: Regulatory Economist II, Maryland Public Service Commission, Baltimore, MD

2009-2011: Regulatory Economist I, Maryland Public Service Commission, Baltimore, MD

Education

B.A., Business Administration, Economics, Accounting/Economics, McDaniel College, 2009

Select Projects

- Connecticut Energy Efficiency Board. Senior Technical Lead of the oversight of the state's electric and gas residential energy efficiency programs. Work closely with the state's utilities to develop, implement, and evaluate cost-effective program designs and goals for the Three-Year Conservation and Load Management Plan.
- Louisiana Public Service Commission. Filed testimonies evaluating the reasonableness of automated metering infrastructure implementation plans by Concordia Electric Cooperative, Inc., Southwest Louisiana Electric Membership Corporation, and Point Coupee Electric Membership Corporation. (2020-2021)
- Pennsylvania Office of Consumer Advocate. Reviewed and commented on potential studies utilized to develop energy efficiency and demand response targets for Phase III and IV of the Act 129 Energy Efficiency and Conservation (EE&C) Program. Provided written testimony on utility EE&C five-year plans. (2015-2021)

Energy Futures Group, Inc

PO Box 587, Hinesburg, VT 05461 – USA | 410-371-0623 | ssherwood@energyfuturesgroup.com

- Arkansas Attorney General's Consumer Utility Rate Advocacy Division. Drafted a dedicated limited income EE program strawman implemented on a pilot basis by the electric and natural gas utilities. (2018-2020)
- Arkansas Attorney General's Consumer Utility Rate Advocacy Division. Participated in Parties Working Collaboratively (PWC) group regarding the electric and natural gas EE programs. Provided comments on three-year plans, annual progress reports, and evaluation, measurement, and verification reports. (2017-2021)
- U.S. Air Force Civil Engineer Center. Evaluated the feasibility of geothermal energy production at Edwards Air Force Base. (2015-2016)
- Maryland Public Service Commission Staff. Developed templates and directed work groups related to the implementation of the electric and natural gas EmPOWER Maryland EE and DR programs. Evaluated the semi-annual reports and three-year plans filed by the utilities and submitted comments regarding plan recommendations before the Maryland Public Service Commission. (2009-2015)

Select Publications

- Author on Chapter 2.5 Environmental Justice, Final Report Concerning the Maryland Renewable Portfolio Standard as Required by Chapter 393 of the Acts of The Maryland General Assembly of 2017, https://dnr.maryland.gov/pprp/Documents/FinalRPSReportDecember2019.pdf.
- Lead Author, Power Plant Research Program, Maryland Department of Natural Resources
  - Electricity in Maryland – Fact Book, 2019
  - Electricity in Maryland – Fact Book, 2016

Expert Testimony

Before the State of Maine Public Utilities Commission, Docket No. 2022-0025 *Versant Power Request for Approval of a Distribution Rate Change – 307*, December 2022, for Maine Office of Consumer Advocate. Testified regarding the reasonableness of the overall revenue increase.

Before the Kansas Corporation Commission, Docket No. 22-EKME-254-TAR *In the Matter of the Application of Evergy Kansas Metro, Inc., Evergy Kanasas South, Inc. and Evergy Kansas Central, Inc. for Approval of its Demand-Side Management Portfolio Pursuant to the Kansas Energy Efficiency Investment Act ("KEEIA"), K.S.A. 66-1283,* June 2022, for Natural Resources Defense Council. Testified regarding reasonableness of the proposed Plan and its compliance with the KEEIA Act.

Before the Louisiana Public Service Commission, Docket No. U-35877 *Pointe Coupee Electric Membership Corporation Application to Acquire and Install an Automated Metering System and Request for Cost Recovery and Related Relief,* February 2021, for the Louisiana Public Service Commission Staff. Testified regarding the implementation of

automated metering infrastructure to replace current meters. (Case settled prior to cross-examination.)

Before the Pennsylvania Public Utilities Commission, Docket No. M-2020-3020818, *Petition of Duquesne Light Company for Approval of its Energy Efficiency and Conservation Phase IV Plan*, January 2021, on behalf of the Pennsylvania Office of Consumer Advocate. Testified regarding reasonableness of the proposed Plan and its compliance with Pennsylvania Act 129. (Case settled prior to cross-examination.)

Before the Pennsylvania Public Utilities Commission, Docket No. M-2020-3020830, *Petition of PECO Energy Company for Approval of its Energy Efficiency and Conservation Phase IV Plan*, January 2021, on behalf of the Pennsylvania Office of Consumer Advocate. Testified regarding reasonableness of the proposed Plan and its compliance with Pennsylvania Act 129. (Case settled prior to cross-examination.)

Before the Pennsylvania Public Utilities Commission, Docket No. M-2020-3020824, *Petition of PPL Electric Utilities for Approval of its Energy Efficiency and Conservation Phase IV Plan*, January 2021, on behalf of the Pennsylvania Office of Consumer Advocate. Testified regarding reasonableness of the proposed Plan and its compliance with Pennsylvania Act 129. (Case settled prior to cross-examination.)

Before the Louisiana Public Service Commission, Docket No. U-35707 Southwest Louisiana Electric Membership Corporation *Application for Approval to Acquire and Install an Automated Metering System and Request for Cost Recovery and Related Relief,* December 2020, for the Louisiana Public Service Commission Staff. Testified regarding the implementation of automated metering infrastructure to replace current meters. (Case settled prior to cross-examination.)

Before the Pennsylvania Public Utilities Commission, Docket No. R-2020-3020919 *Pennsylvania Public Utility Commission v. Audubon Water Company*, November 2020, for the Pennsylvania Office of Consumer Advocate. Testified regarding reasonableness of the overall revenue increase. (Case settled prior to cross-examination.)

Before the Pennsylvania Public Utilities Commission, Docket No. R-2020-3020256 *Pennsylvania Public Utility Commission v. City of Bethlehem – Water Department*, November 2020, for the Pennsylvania Office of Consumer Advocate. Testified regarding reasonableness of the overall revenue increase. (Case settled prior to cross-examination.)

Before the Louisiana Public Service Commission, Docket No. U-35456 Concordia Electric Cooperative Inc. *Application for Certification of a Replacement Advanced Metering System and Approval of Related Financing*, November 2020, for the Louisiana Public Service Commission Staff. Testified regarding the implementation of automated metering infrastructure to replace current meters. (Case settled prior to cross-examination.)

Before the Pennsylvania Public Utilities Commission, Docket No. R-2020-3019612
Pennsylvania Public Utility Commission v. Reynolds Disposal Company, October 2020, for the Pennsylvania Office of Consumer Advocate. Participated in mediation regarding reasonableness of the overall revenue increase.

Before the Pennsylvania Public Utilities Commission, Docket No. R-2019-3010955
Pennsylvania Public Utility Commission v. City of Lancaster – Sewer Fund, October 2019, for the Pennsylvania Office of Consumer Advocate. Testified regarding reasonableness of the overall revenue increase.

Before the Pennsylvania Public Utilities Commission, Docket No. R-2019-3008208
Pennsylvania Public Utility Commission v. Wellsboro Electric Company, October 2019, for the Pennsylvania Office of Consumer Advocate. Testified regarding reasonableness of the overall revenue increase.

Before the Pennsylvania Public Utilities Commission, Docket No. R-2019-3008209
Pennsylvania Public Utility Commission v. Valley Energy, Inc, October 2019, for the Pennsylvania Office of Consumer Advocate. Testified regarding reasonableness of the overall revenue increase.

Before the Pennsylvania Public Utilities Commission, Docket No. R-2019-3008212,
Pennsylvania Public Utility Commission v. Citizens' Electric Company of Lewisburg, PA, October 2019, for the Pennsylvania Office of Consumer Advocate. Testified regarding reasonableness of the overall revenue increase.

Before the Pennsylvania Public Utilities Commission, Docket No. R-2019-3009559,
Pennsylvania Public Utility Commission v. Eaton Sewer & Water Company, Inc. – Wastewater Division, August 2019, for the Pennsylvania Office of Consumer Advocate. Participate in mediation regarding reasonableness of the overall revenue increase.

Before the Pennsylvania Public Utilities Commission, Docket No. R-2019-3009567,
Pennsylvania Public Utility Commission v. Eaton Sewer & Water Company, Inc. – Water Division, August 2019, for the Pennsylvania Office of Consumer Advocate. Participate in mediation regarding reasonableness of the overall revenue increase.

Before the Pennsylvania Public Utilities Commission, Docket No. R-2019-3008947,
Pennsylvania Public Utility Commission v. Community Utilities of Pennsylvania Inc. Water Division, July 2019, for the Pennsylvania Office of Consumer Advocate. Testified regarding reasonableness of the overall revenue increase. (Case settled prior to cross-examination.)

Before the Pennsylvania Public Utilities Commission, Docket No. R-2019-3008948,
Pennsylvania Public Utility Commission v. Community Utilities of Pennsylvania Inc.

Wastewater Division, July 2019, for the Pennsylvania Office of Consumer Advocate. Testified regarding reasonableness of the overall revenue increase. (Case settled prior to cross-examination.)

Before the Pennsylvania Public Utilities Commission, Docket No. R-2019-3006904, *Pennsylvania Public Utility Commission v. The Newtown Artesian Water Company (Supplement No. 136 to Tariff Water – Pa. P.U.C. No. 9)*, March 2019, for the Pennsylvania Office of Consumer Advocate. Testified regarding reasonableness of the overall revenue increase. (Case settled prior to cross-examination.)

Before the Pennsylvania Public Utilities Commission, Docket No. R-2018-3006814, *Pennsylvania Public Utility Commission v. UGI Utilities, Inc – Gas Division (Utility Code 123100, Filed Tariff Gas- Pa. P.U.C. Nos. 7 and 7S)*, January 2019, on behalf of the Pennsylvania Office of Consumer Advocate. Testified regarding reasonableness of its proposed consolidated natural gas energy efficiency plan. (Case settled prior to cross-examination.)

Before the Pennsylvania Public Utilities Commission, Docket No. M-2018-3004144, *Petition of UGI Utilities, Inc. – Electric Division for Approval of of its Energy Efficiency and Conservation Plan*, August 2018, on behalf of the Pennsylvania Office of Consumer Advocate. Testified regarding reasonableness of proposed Plan. (Case settled prior to cross-examination.)

Before the Pennsylvania Public Utilities Commission, Docket No. R-2018-3001307, *Pennsylvania Public Utility Commission v. Hidden Valley Utility Services, L.P. – Wastewater (General Rate Increase Filed Pursuant to 66 PS. CS 1308, Including Answers to 52 PA. Code 53.52)*, April 2018, on behalf of the Pennsylvania Office of Consumer Advocate. Testified regarding the reasonableness of the overall revenue increase.

Before the Pennsylvania Public Utilities Commission, Docket No. R-2018-3001306, *Pennsylvania Public Utility Commission v. Hidden Valley Utility Services, L.P. – Water (General Rate Increase Filed Pursuant to 66 PS. CS 1308, Including Answers to 52 PA. Code 53.52)*, April 2018, on behalf of the Pennsylvania Office of Consumer Advocate. Testified regarding the reasonableness of the overall revenue increase.

Before the Pennsylvania Public Utilities Commission, Docket No. P-2015-2497267, *Petition of Duquesne Light Company for Approval of its Smart Meter Procurement and Installation Plan*, February 2016, on behalf of the Pennsylvania Office of Consumer Advocate. Testified regarding the inclusion of additional costs related to the Plan's implementation.

Before the Pennsylvania Public Utilities Commission, Docket No. M-2015-2477174, *Petition of UGI Utilities, Inc. – Electric Division for Approval of Phase II of its Energy Efficiency and Conservation Plan*, February 2016, on behalf of the Pennsylvania Office of

Consumer Advocate. Testified regarding reasonableness of proposed Plan. (Case settled prior to cross-examination.)

Before the Pennsylvania Public Utilities Commission, Docket No. M-2015-2515642, *Petition of PPL Electric Utilities for Approval of its Energy Efficiency and Conservation Phase II Plan*, January 2016, on behalf of the Pennsylvania Office of Consumer Advocate. Testified regarding reasonableness of the proposed Plan and its compliance with Pennsylvania Act 129. (Case settled prior to cross-examination.)

Before the Pennsylvania Public Utilities Commission, Docket No. M-2015-2515375, *Petition of Duquesne Light Company for Approval of its Energy Efficiency and Conservation Phase II Plan*, January 2016, on behalf of the Pennsylvania Office of Consumer Advocate. Testified regarding reasonableness of the proposed Plan and its compliance with Pennsylvania Act 129. (Case settled prior to cross-examination.)

Before the Public Utilities Commission of Rhode Island, Docket No. 4595, *Newport Water Division – Rate Application to Collect Additional Revenues of $1,304,595 for a Total Cost of Service of $20,151,440*, December 2015, on behalf of the Division of Public Utilities and Carriers. Testified regarding reasonableness of the overall rate revenue increase.

Before the Maryland Public Service Commission, Case No. 9311, *In the Matter of the Application of Potomac Electric Power Company for an Increase in its Retail Rates For the Distribution of Electric Energy*, April 2013, on behalf of the Maryland Public Service Commission Staff. Testified regarding the inclusion of advanced metering infrastructure meters and energy advisor and engineer positions in rates.

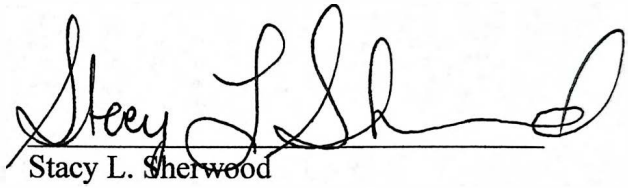
BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

Petition of UGI Utilities, Inc. – Electric Division for Approval of Phase IV of its Energy Efficiency and Conservation Plan	: : :	Docket No. M-2023-3043230

VERIFICATION

I, Stacy L. Sherwood, hereby state that the facts set forth in my Direct Testimony, OCA Statement 1, are true and correct (or are true and correct to the best of my knowledge, information, and belief) and that I expect to be able to prove the same at a hearing held in this matter. I understand that the statements herein are made subject to the penalties of 18 Pa.C.S. § 4904 (relating to unsworn falsification to authorities).

DATED: December 1, 2023
*4856-2414-3764

Signature: 
Stacy L. Sherwood

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COMMONWEALTH OF PENNSYLVANIA

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January 9, 2024

Via Electronic Mail Only
The Honorable Mark A. Hoyer
Administrative Law Judge
Pennsylvania Public Utility Commission
301 5th Avenue, Suite 220
Pittsburgh, PA 15222
mhoyer@pa.gov

Re: Petition of UGI Utilities, Inc. – Electric Division for Approval of Phase IV of its Energy Efficiency and Conservation Plan
Docket No. M-2023-3043230

Dear Judge Hoyer and Counsel:

Enclosed please find a copy of the Surrebuttal Testimony being submitted on behalf of the Office of Consumer Advocate in the above-referenced proceeding, as follows:

OCA Statement 1SR: Surrebuttal Testimony of Stacy L. Sherwood, with Exhibit SLS-1 and Ms. Sherwood's signed verification dated January 9, 2024.

Copies have been served as indicated on the enclosed Certificate of Service.

Respectfully submitted,

/s/ Melanie J. El Atieh
Melanie J. El Atieh
Senior Assistant Consumer Advocate
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Enclosures:
cc: PUC Secretary Rosemary Chiavetta, (Letter and Certificate of Service Only)
Certificate of Service
*4882-2096-4763

CERTIFICATE OF SERVICE

Petition of UGI Utilities, Inc. – Electric Division for Approval of Phase IV of its Energy Efficiency and Conservation Plan	: : :	Docket No. M-2023-3043230

Dated this 9th day of January 2024.

I hereby certify that I have this day served a true copy of the following documents:

> OCA Statement 1SR: Surrebuttal Testimony of Stacy L. Sherwood, with Exhibit SLS-1 and Ms. Sherwood's signed verification dated January 9, 2024

upon parties of record in this proceeding in accordance with the requirements of 52 Pa. Code § 1.54 (relating to service by a participant), in the manner and upon the persons listed below:

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*4881-0490-0507

OCA St. 1SR

BEFORE THE

PENNSYLVANIA PUBLIC UTILITY COMMISSION

PETITION OF UGI UTILITIES, INC. - ELECTRIC DIVISION FOR APPROVAL OF PHASE IV OF ITS ENERGY EFFICIENCY AND CONSERVATION PLAN	**)** **)** **)** **)** **)**	**DOCKET NO. M-2023-3043230**

SURREBUTTAL TESTIMONY

OF

STACY L. SHERWOOD

ON BEHALF OF
PENNSYLVANIA OFFICE OF CONSUMER ADVOCATE

January 9, 2024

TABLE OF CONTENTS

I. INTRODUCTION

Q. WOULD YOU PLEASE STATE YOUR NAME AND BUSINESS ADDRESS?

A. My name is Stacy L. Sherwood. I am a Managing Consultant with Energy Futures Group ("EFG"). Our office is located at 10298 Route 116, Hinesburg, Vermont 05461. EFG provides expert consulting services in the design and evaluation of programs and policies that promote investments in efficiency, renewable energy, distributed resources, and strategic electrification.

Q. DID YOU PREVIOUSLY SUBMIT TESTIMONY IN THIS PROCEEDING?

A. Yes, I submitted direct testimony, OCA Statement 1 on behalf of the Pennsylvania Office of Consumer Advocate ("OCA") on December 1, 2023.

Q. WHAT IS THE PURPOSE OF YOUR SURREBUTTAL TESTIMONY?

A. My surrebuttal testimony is in response to certain sections of UGI Utilities, Inc. – Electric Division's ("UGI Electric's" or the "Company's") rebuttal testimony submitted by Theodore M. Love. In particular, I am addressing the following: (1) Appliance Rebate Program, including (a) participation forecast, (b) fuel-switching measures, and (c) weatherization, (2) energy efficiency kits, (3) low-income program, (4) evaluation, and (5) my overall concerns after reviewing the Company's rebuttal testimony.

II. APPLIANCE REBATE PROGRAM

a. Participation Forecast

Q. IN YOUR DIRECT TESTIMONY, YOU INDICATED CONCERNS ABOUT THE PROJECTED LEVEL OF PARTICIPATION IN THE APPLIANCE REBATE PROGRAM. DID THE COMPANY'S REBUTTAL TESTIMONY ADDRESS YOUR CONCERNS?

A. No. The Company anticipates that an influx of marketing for one year is going to result in the increase in participation that is forecasted from current levels. However, they are projecting this without a marketing plan or changes to the program implementation strategy. Furthermore, in its rebuttal testimony the Company states that it will leverage "tax credits and other incentives offered by the IRA [Inflation Reduction Act]"[1] , but in its direct testimony it indicates that the IRA is a source of uncertainty, and it is unclear how many customers will take advantage of tax credits.[2] Therefore, it's unclear how or why the Company is relying upon the rebates and tax credits under IRA as justification for its projected participation. The level of participation projected does not appear to be reasonable based on recent performance (within the last 3 years).

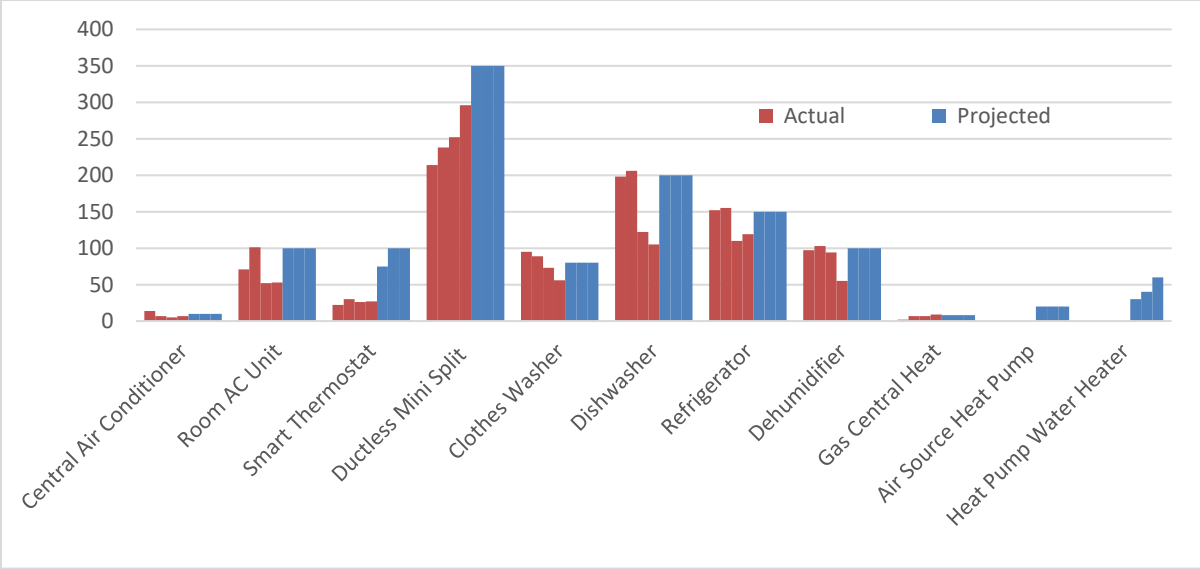
Q. THE COMPANY DISCUSSED THE BASIS FOR ITS PROJECTIONS FOR THE APPLIANCE REBATE PROGRAM. DO YOU AGREE WITH THE ASSUMPTIONS USED?

A. While the Company may have reviewed prior participation, it seemed to ignore the performance in PY 10 and PY 11, where participation in the Appliance Rebate Program dropped significantly and the performance in PY12 is

[1]UGI Electric Statement No. 1-R, page 28 lines 8-10; page 29, lines 12-15, page 30, lines 1-2.
[2] Direct testimony of Theodore M. Love, UGI Electric Statement No. 1, page 7, lines 3-12.

unknown. Therefore, I do not agree with the forecasted level of participation, particularly with unknowns such as the marketing plan. Furthermore, I do not agree with the Company's review of participation as they looked at overall participation by HVAC and non-HVAC measures. Individual measure review is important due to the variance in level of savings and incentives. As shown in my direct testimony, and replicated below, when reviewing individual levels of participation, the forecasted level of participation for seven measures previously rebated is significantly higher than what has been achieved in PY 10 and PY 11. If the HVAC measures overperform compared to the non-HVAC measures, it could impact the budget and limit overall participation in the program. A sensitivity analysis would provide an indication of how scenarios like this will impact the program's performance.

Figure 1 Appliance Rebate Program Rebates Actual Compared to Forecasted



Q. WITH RESPECT TO THE FORECASTED PARTICIPATION AND THE MEASURES OFFERED UNDER THE APPLIANCE REBATE PROGRAM, WHAT ARE YOUR RECOMMENDATIONS?

A. Consistent with my direct testimony, I offer the following recommendations:

- The Commission should direct the Company to provide a sensitivity analysis of its Plan to reflect historical participation and spending levels, as well as the potential popularity of electrification measure as an impact of IRA funding. The sensitivity analysis should indicate the impact on cost, savings, program cost-effectiveness, and overall portfolio cost-effectiveness.

- The Commission should direct the Company to highlight ways that it plans to achieve the forecasted participation, with specific language on how it plans to expand program eligibility to address low-income and disadvantaged customers within its service territory. One factor that may encourage participation in the programs is the availability of IRA tax credits and rebates. Therefore, as part of Plan approval, the Commission should direct the Company to evaluate whether its Appliance Rebate Program measures meet the eligibility requirements of the IRA. If the measures meet the IRA requirements, the Company should be directed to notify participants through its website and any marketing and rebate materials that they may be eligible to receive IRA tax credits or rebates. Similarly, the Company should be directed to identify those measures that do not meet the IRA eligibility

requirements and be directed to notify participants that they are not eligible to receive tax credits or rebates for such measures.

b. <u>Fuel Switching Measures</u>

Q. DID THE COMPANY ADDRESS YOUR CONCERNS REGARDING FUEL SWITCHING?

A. No. Mr. Love asserts that there is plenty of basis for offering fuel switching measures in the Plan because (1) fuel switching measures are included in the Commission's current TRM, (2) PPL offers a fuel switching program; (3) the IRA offers tax credits to incentivize natural gas HVAC equipment and insulation and air sealing measures for natural gas heated homes; (4) the measures are cost-effective, beneficial to customers, and popular with customers; and (5) removing heating load from the electric system entirely would provide more savings towards the Plan's goal of reducing energy consumption.[3]

Q. DO YOU AGREE WITH THE COMPANY'S RATIONALE?

A. No. First, inclusion of a measure in the TRM does not mean it must be included as part of a portfolio. For example, the Company states that fuel switching measures are in the TRM, but so are weatherization measures, and the Company does not offer those. Therefore, inclusion of the measures in the TRM is not a sufficient basis to be included as part of a portfolio.

Second, PPL is the only EDC that offers a fuel switching pilot, but the pilot was implemented as part of a settlement. However, unlike UGI Electric's Plan which is voluntary and not subject to penalties for failure to achieve savings targets, PPL, as an Act 129 EDC, faces potential penalties for its failure to

[3] UGI Electric Statement No. 1-R, pages 42 - 43.

meet the savings targets. Hence, Commission approval of a settlement in an Act 129 EDC plan does not translate to a rationale on the reasonableness of fuel switching measures in a voluntary EE&C plan.

Third, while I agree the IRA contains tax incentives for natural gas heating efficiency, national policy objectives to promote overall energy efficiency does not provide a basis to incentivize in this voluntary, *electric ratepayer*-funded program the permanent removal of electric heating load from the distribution system. While the Company does indicate that natural gas heated homes can receive rebated weatherization measures under the IRA rebates, that is not the priority of the IRA. As indicated by the Department of Energy, the IRA rebates are focused on supporting home energy efficiency and electrification projects and reducing the reliance on fossil fuels.[4] Therefore, the IRA weatherization rebates are not to incentivize natural gas equipment, but rather to reduce the usage of fossil fuels.

Fourth, the Company states that it offers measures that are cost-effective and popular and that reduce customer bills, which is something that providing added incentives to shift customers from electric resistance heating (plug-in or baseboard) to heat pumps (central or ductless) would accomplish. It is unclear what the Company means when it states that the fuel switching measures are popular. From PY8 through PY11, the Company rebated 25 gas high efficiency central heat systems from electric systems compared to the 80 it had projected during that time. Comparatively, during that same time, the Company rebated 1,000 ductless mini split heat pumps compared to the 341 it had projected. In

[4] "About the Home Energy Rebates," Department of Energy, https://www.energy.gov/scep/home-energy-rebates-programs, accessed January 7, 2024.

terms of popularity, it seems that the ductless mini-split heat pump is favored more by the electric ratepayers.

Fifth, while the Company advances the permanent removal of heating load from the electric system as part of this Plan, it omits that the only natural gas distribution company that would benefit from such fuel switching would be the Company's affiliate, UGI Gas. UGI Gas's northern service territory overlaps completely with UGI Electric's service territory. UGI Electric's ratepayers potentially would be harmed by the permanent removal of electric heating load from the system because it will permanently reduce sales across which the electric utility company's fixed costs can be spread for determining base rates.

Q: IF THE COMMISSION PERMITS THE COMPANY TO CONTINUE OFFERING FUEL SWITCHING MEASURES AS PART OF ITS PLAN, ARE THE COMPANY'S PROPOSED MEASURES REASONABLE?

A. No. The fuel switching measures proposed by the Company are extremely non-cost effective. In the Company's response to OCA-I-11, attached to my testimony as Exhibit SLS-1, natural gas equipment such as furnaces and boilers must be Energy Star rated in order to qualify for a fuel switching rebate. However, the natural gas furnaces have a benefit-cost ratio ("BCR") of 0.06 and the natural gas boilers have a BCR of -0.01.[5] The BCRs for these two measures are the lowest BCRs for any measure offered under the Appliance Rebate Program, and the natural gas boiler is the only measure with a negative BCR. Additionally, the size of the incentive is also unreasonable. The Company is offering a rebate of $1,500 for the conversion from an electric

[5] Company's response to OSBA 1-1.

heating system to a natural gas furnace or boiler. This is excessive compared to PPL's fuel switching program, which only provides a $200 rebate for customers converting from an electric heating system to a natural gas furnace or boiler.[6]

Q. IF THE COMMISSION PERMITS THE COMPANY TO CONTINUE OFFERING FUEL SWITCHING MEASURES AS PART OF ITS PLAN, DO YOU HAVE ANY RECOMMENDATIONS?

A. Yes. First, the measures that the Company is offering have lower efficiency levels compared to other programs with furnace and boiler offerings. The Company plans to rebate natural gas furnaces that have an Annual Fuel Utilization Efficiency ("AFUE") of 95% and natural gas boilers with a 90% AFUE.[7] Comparatively, other states have requirements that the equipment be equal to or greater than 97% AFUE for natural gas furnaces and 95% AFUE for natural gas boilers. If the Company is going to fuel switch customers and lock them into a natural gas heating system for 15 years (the assumed lifetime), then it should be with the higher efficiency equipment. Second, as I discussed above, the Company is offering an excessively generous rebate of $1,500 – paid for by electric ratepayers – for the conversion from an electric heating system to a natural gas furnace or boiler. In contrast, PPL's fuel switching program only provides a $200 rebate for customers converting from an electric heating system to a natural gas furnace or boiler.[8]

Therefore, if the Commission approves the fuel switching measures as part of the Plan, it should at a minimum require the program offerings to match those

[6] https://ppl.clearesult.com/fuel-switching-central-heating
[7] Company's response to OSBA 1-1.
[8] https://ppl.clearesult.com/fuel-switching-central-heating

offered under the PPL pilot program. However, I urge the Commission to require the efficiency level of the equipment to be increased to 97% AFUE for natural gas furnaces and 95% AFUE for natural gas boilers to encourage the adoption of the most efficient equipment.

Q. DO YOU AGREE WITH MR. LOVE'S OPINION THAT THERE WOULD BE A LARGER ADMINISTRATIVE BURDEN TO VERIFY CUSTOMER'S BASELINE EQUIPMENT FOR INCREASED INCENTIVES FOR ELECTRIC RESISTANCE HEATING?[9]

A. It is unclear what the level of administrative burden would be associated with this. It would require additional information to be submitted with the rebate form, but such information can be verified simply through pictures or a qualification from the contractor that is performing the work. However, I do not think the increased administrative burden should be the barrier for consideration of this incentive, particularly given the level of savings that may offset any added expense. The Company should evaluate this measure as an offering within this Plan cycle.

Q. WHAT IS YOUR RECOMMENDATION FOR THE FUEL SWITCHING MEAURES?

A. Consistent with my position in my direct testimony, the Company should discontinue, and the Commission should reject the natural gas efficiency measures to promote electric to natural gas fuel switching as part of this Plan. As part of my surrebuttal testimony, I offer this alternative recommendation if the Commission does not reject the fuel switching measures: the Commission should require the Company to reduce the incentives for natural gas furnace

[9] UGI Electric Statement No. 1-R, page 44, lines 1-12.

and boilers to $200 per measure to match the incentives offered through the PPL pilot program and increase the minimum equipment efficiency levels to equal to or greater than 97% AFUE for natural gas furnaces and 95% AFUE for natural gas boilers.

Q. DO YOU HAVE ANY ADDITIONAL RECOMMENDATIONS IF THE FUEL SWITCHING MEASURES CONTINUE?

A. Yes, I have two recommendations. First, the Company should clearly state on its website and rebate form that the rebate is for the equipment and is not for the extension of a service line to the property. As part of that, UGI Electric should explicitly state that by receiving natural gas service, the customer is subject to the terms and conditions in UGI Gas's tariffs.

Second, the Company should evaluate the impact of free ridership on the fuel switching measures as part of its residential program evaluation. The Company should determine if the incentives are being provided to customers that would have otherwise invested in fuel switching. The free ridership findings should be reflected in the amount of savings claimed by the Company in its annual reports.

c. <u>Weatherization</u>

Q. DO YOU AGREE WITH THE COMPANY'S APPROACH TO WEATHERIZATION?

A. No. The Company did not evaluate any weatherization measures because they assert that they were not successful in the past. I think this is the wrong approach, as different program offerings and implementation strategies, coupled with IRA offerings, could result in a successful implementation of weatherization measures. Not evaluating the measures is, in my view,

shortsighted for ratepayers. Furthermore, it is unclear what the Company means by not successful, whether it is the number of measures rebates, cost-effectiveness, or other criteria and how those outcomes may change with the current and upcoming market.

Q. DID THE COMPANY OFFER ANY RECOMMENDATIONS RELATED TO EDUCATING ITS CUSTOMERS ON THE IMPORTANCE OF WEATHERIZATION.

A. The Company acknowledged that it does not offer any information or education related to weatherization measures, indicating that the inclusion of such information may result in customer confusion.[10] While including such information on the rebates may be confusing, Witness Love indicates that he would recommend that the website be developed for the Energy Kits Program to include information on the benefits of weatherization.

Q. DO YOU BELIEVE THAT THIS RECOMMENDATION IS SUFFICIENT?

A. I encourage the recommendation to include weatherization information on the Company's website; however, I have concerns about this being the only method of conveying the information, as the evaluation study of the School Energy Kit Program found that "one consistent finding across kits and years was that students and parents generally have not visited UGI's website to learn more about other energy efficiency programs."[11] It's unclear how effective the education being provided on the website will be for ratepayers if the education program provided by the Company fails to drive traffic to the website.

Q. WHAT ARE YOUR RECOMMENDATIONS RELATED TO WEATHERIZATION WITHIN THE APPLIANCE REBATE PROGRAM? ?

[10] UGI Electric Statement No. 1-R, page 47, lines 6-9.
[11] UGI Electric Statement No. 1-R, Exhibit TML-6R, page 60.

A. Based upon my review of the Company's rebuttal testimony, I maintain the recommendations outlined in my direct testimony for the Appliance Rebate Program.

- The Company should encourage customers to consider weatherization measures, particularly those seeking heating, ventilation, and air conditioning ("HVAC") upgrades, regardless of whether the program offers weatherization rebates or audits to promote proper sizing of HVAC equipment.
    - Promotion of weatherization should be provided via marketing materials, including the website and the rebate application.
    - Provide contractor training on the importance of properly sizing equipment and promoting weatherization to occur prior to the installation of HVAC equipment. Encourage contractors to convey this information to participants as part of the sales pitch for the HVAC equipment.
    - Consider providing an incentive to contractors when they ensure that weatherization occurs prior to the installation of the rebated HVAC equipment.

III. ENERGY EFFCIENCY KITS

Q. AS PART OF THE UGI ELECTRIC PHASE III PLAN FILING, DID YOU INCLUDE A RECOMMENDATION TO CONSIDER OFFERING ENERGY EFFICIENCY KITS TARGETED FOR LOW-INCOME CUSTOMERS?

A. Yes, I did. In its Phase III Plan, the Company proposed eliminating its dedicated low-income program and requested that it use funds allocated under the Emerging Technology and Outreach ("ETO") to pilot initiatives including a low-income energy efficiency kit program. In that proceeding, I stated that there was not a need to pilot the low-income energy efficiency kit program since it was an established measure in other programs and because it would fill the need for a dedicated low-income program.[12] Additionally, the measures proposed in the Phase III kits varied from the kits proposed in this proceeding, as the energy efficiency kits in this proceeding no longer include lighting.

Q. DID YOU PROVIDE ANY OTHER RECOMMENDATIONS IN YOUR DIRECT TESTIMONY ON UGI'S PHASE III PLAN?

A. Yes. While I did recommend an energy efficiency kit for low-income customers, I argued that the in-service rates were low and that ratepayers would be funding a significant portion of measure that will not be utilized.[13] This is consistent with the concerns I have raised in this proceeding. As a result of the low in-service rates, I provided recommendations on how to reduce the potential for uninstalled measures.

Q. ARE THERE OTHER CONSIDERATIONS THAT FACTORED INTO YOUR RECOMMENDATION AS PART OF THIS PROCEEDING?

A. Yes. As noted in my direct testimony, in addition to the continued low in-service rates, the measures provided in the kit are limited to mostly water savings measures (the exception is the smart strip) and there is potential for over saturation given the length of time for the School Energy Kit Program.

[12] Docket No. M-2018-3004144, OCA St.1, page 17, lines 3-9.
[13] Docket No. M-2018-3004144, OCA St.1, page 15, lines 5-10.

Q. DO YOU AGREE WITH THE COMPANY'S ASSESSMENT THAT YOU IGNORED THE FULL RANGE OF BENEFITS OF THE ENERGY EFFICIENCY KIT PROGRAMS?

A. No, I do not. I recognize that there are secondary benefits, such as education and marketing of other energy efficiency opportunities. However, as evident in the evaluation of the School Energy Kit Program, the education and marketing element in this program is not as effective as the Company may be assuming it is. If the Company is relying upon the kits to cross-promote its other programs and educate its customers, it should consider re-evaluating that material to make it more effective to achieve these objectives.

Additionally, I asserted that the kit savings are primarily focused on secondary savings, the reduction in water use. While decreased water usage does result in saved energy from water heating, the majority of the benefits highlighted by the Company from the kits results in water savings benefits, such as reduced water bills, avoided water infrastructure, and protected water supplies.[14] These are great secondary benefits but should not be the primary focus for measures implemented by an electric conservation program, particularly when water savings measures make up the majority of the kit and have low in-service rates.

Q. WHAT ARE YOUR RECOMMENDATIONS FOR THE ENERGY EFFICIENCY KITS?

A. Based upon my review of the Company's rebuttal testimony, I maintain that the Company overly relies upon energy efficiency kits to obtain electric savings. The Commission should not approve the Energy Efficiency Kit program. Instead, the Energy Efficiency Kit budget should be shifted to

[14] UGI Electric Statement No. 1-R, page 40, lines 20 to page 41, line 1.

promote other measures already proposed in the Plan or to fund the inclusion of weatherization measures. The School Energy Kit Program should limit the kit offerings to homes that have not received a kit in the past five years.

IV. LOW-INCOME PROGRAM

Q. DID THE COMPANY PRESENT REVISED DATA AS PART OF ITS REBUTTAL TESTIMONY?

A. Yes. The Company indicated that the PY11 report erroneously stated that only one heat pump water heater ("HPWH") was installed, when in fact it should have stated one Wi-Fi thermostat was installed and 10 HPWH.

Q. HOW DOES THIS CHANGE YOUR RECOMMENDATION?

A. The program in PY11 was successful in achieving its forecast and hopefully that continues in future program years. With the change in performance in PY11 and the Company's indication that the community-based organization they are working with has a list of eligible recipients of a HPWH, I have revised my recommendation and think the measure should continue to be offered. That said, my concerns regarding the level of participation for low-income customers remain, and I do not believe that the Company should rely upon low-income participation through the kits program alone. I recommend that the Company shift funds from the Energy Kits Program to the Low-Income Program to allow for increased participation, either through an increased number of HPWH or an addition of measure(s).

V. EVALUATION

Q. DOES THE COMPANY BELIEVE THAT EVALUATIONS SHOULD BE FILED AS PART OF THE DOCKET?

A. No. They do not believe that it is necessary to file its program evaluations as stakeholders can request them as part of the discovery process.

Q. DO YOU AGREE WITH THIS APPROACH?

A. No. The EDCs that participate in Act 129 file their evaluations in the docket. Furthermore, the evaluations are funded by ratepayers and should be publicly available. When it comes to transparency, UGI Electric should not be held to a different requirement. The Commission should require the Company to provide transparency as part of its program evaluation. Providing this level of transparency will also assist in future review of the Company's plan proposals as it will provide an evaluation of how the programs have performed over time.

Q. WHAT ARE YOUR RECOMMENDATIONS FOR THE PLAN EVALUATION?

Based upon my review of the Company's rebuttal testimony, I maintain the recommendations outlined in my direct testimony. The Commission should require that the Company file its evaluation of programs in this docket. Additionally, program evaluations conducted to date should be filed as part of its annual plan filings.

VI. OVERALL CONCERNS

Q. UPON REVIEWING THE COMPANY'S REBUTTAL TESTIMONY, DID YOU HAVE ANY OVERARCHING CONCERNS?

A. Yes. The Company appears to be focused on providing a portfolio with the greatest cost-effectiveness possible and relying upon the same measures year over year because they deem them to be popular. This approach ultimately hinders the ability to provide meaningful and long-term savings through a utility energy efficiency program, for the following reasons:

- It limits the overall long-term effectiveness of reducing energy consumption by incentivizing measures with short measure lives and without core weatherization measures which allow for a comprehensive approach to energy savings.
- It limits future portfolios and can negatively impact future cost-effectiveness by not having highly cost-effective measures being used to offset less cost-effective measures, such as having energy kits offset weatherization services.
- It ignores best practices by not offering a comprehensive program.
- It potentially wastes ratepayer dollars through the saturation of low in-service measures.

The Company recognizes that its "plans are currently exceedingly cost-effective"[15], but the Company opts to not capitalize the high cost-effectiveness of the portfolio by including comprehensive measures and programs that have long measure lives but may be less cost-effectiveness. If the Company only focuses on offering the most cost-effective portfolio, it may be setting a

[15] UGI Electric Statement No. 1-R, page 31, line 20.

premature ending to offering EE&C programs within its service territory as the market will be saturated with the low-cost measures and will be unable to effectively offset the higher cost to implement or incentivize other measures in the future.

The Company appears to want to maintain the status quo for its residential programs; however, I think this could be detrimental to the future implementation of energy efficiency in this service territory. As part of my direct testimony, I provided several examples of best practices and recommendations. The Company only considered adding marketing of IRA tax credits and information on weatherization to its website. It's unclear why the Company, who wants to voluntarily offer these programs, would not consider best practices to expand its electric ratepayer funded portfolio within the budget constraint.

The Company also seems to want to limit any commitments to detailed requirements. For example, the Company indicates that a detailed approach on how to raise awareness of IRA rebates should not be considered as part of this proceeding. However, the Company has not provided any information on its website or other materials regarding the federal tax credits, which have been available for over a year at this point.[16] The Company's lack of attention to providing information on this to its ratepayers to date, indicates that it is necessary to include these requirements as part of this proceeding. Therefore, I recommend the Commission consider the requested elements in my direct and surrebuttal testimony when considering UGI Electric's proposed plan.

[16] UGI Electric Statement No. 1-R, page 47, lines 7-11.

VII. CONCLUSIONS

Q. WITH THE PROPOSED CHANGES YOU HAVE RECOMMENED IN YOUR DIRECT TESTIMONY AND MAINTAINED IN YOUR SURREBUTTAL TESTIMONY, DO YOU BELIEVE THAT THE COMMISSION SHOULD APPROVE THE PLAN?

A. Yes. I believe that a revised Plan that incorporates my recommendations should be approved.

Q. DOES THIS CONCLUDE YOUR SURREBUTAL TESTIMONY?

A. Yes, it does.

Exhibit SLS-1

UGI Utilities, Inc. - Electric Division
Docket No. M-2023-3043230
Phase IV EE&C Approval
Responses to OCA Set I (1-21)
Delivered on November 22, 2023

OCA-I-11

Request:

For the fuel switching rebates, please provide:

a. The efficiency of the natural gas equipment replacing the electric equipment.
b. The justification of fuel switching programs given state and federal efforts to decarbonize residences and buildings.

Response:

a. Natural gas equipment such as furnaces and boilers must be Energy Star rated in order to qualify for a fuel switching rebate.

b. The Company offers a fuel switching program because natural gas is efficient, economical, environmentally friendly, and generally a lower carbon emissions option than existing customer technology.

Prepared by or under the supervision of: Brian J. Meilinger

BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

Petition of UGI Utilities, Inc. – Electric Division for Approval of Phase IV of its Energy Efficiency and Conservation Plan	: : :	Docket No. M-2023-3043230

VERIFICATION

I, Stacy L. Sherwood, hereby state that the facts set forth in my Surrebuttal Testimony, OCA Statement 1SR, are true and correct (or are true and correct to the best of my knowledge, information, and belief) and that I expect to be able to prove the same at a hearing held in this matter. I understand that the statements herein are made subject to the penalties of 18 Pa.C.S. § 4904 (relating to unsworn falsification to authorities).

DATED: January 9, 2024
*4856-2414-3764

Signature: Stacy L Sherwood
Stacy L Sherwood

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