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July 23, 2021

VIA ELECTRONIC FILING

Rosemary Chiavetta, Secretary
Pennsylvania Public Utility Commission
Commonwealth Keystone Building
400 North Street, 2nd Floor North
P.O. Box 3265
Harrisburg, PA 17105-3265

Re: Petition of UGI Utilities, Inc. - Gas Division for Approval of a Minor Change to Its Energy Efficiency and Conservation Plan
Docket No. R-2018-3006814

Dear Secretary Chiavetta:

In compliance with the Secretarial Letter issued on July 21, 2021, in the above-captioned proceeding, enclosed for filing is UGI Utilities, Inc. – Gas Division's Revised Energy Efficiency and Conservation Plan.

Copies are being provided as indicated below and on the Certificate of Service.

Respectfully submitted,

Devin Ryan
Principal

DR/kls
Enclosures

cc: Certificate of Service
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CERTIFICATE OF SERVICE

I hereby certify that a true and correct copy of the foregoing has been served upon the following persons, in the manner indicated, in accordance with the requirements of 52 Pa. Code § 1.54 (relating to service by a participant).

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Date: July 23, 2021

Devin T. Ryan, Esquire

UGI Utilities, Inc. – Gas Division

Consolidated Energy Efficiency and Conservation Plan October 1, 2019 – September 30, 2024

Revised July 23, 2021

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1 Introduction and Background

1.1 Plan Overview

This plan provides a detailed description of the design and implementation of the energy efficiency and conservation portfolio ("EE&C Portfolio" or "Portfolio") that UGI Utilities, Inc. – Gas Division ("UGI Gas" or "the Company") is proposing to offer in its Consolidated Energy Efficiency and Conservation Plan ("EE&C Plan" or "Plan"). The Plan will have a five-year duration, beginning in UGI Gas's fiscal year ("FY") 2020 through FY 2024,[1] and will include both natural gas energy efficiency ("EE") programs and a combined heat and power ("CHP") program.

UGI Gas's EE&C Plan was developed based on the Company's two existing gas EE&C Plans for its South and North rate districts that were approved, respectively, as part of the UGI Gas base rate proceeding in 2016,[2] and as part of the UGI Penn Natural Gas, Inc. ("UGI-PNG") base rate proceeding in 2017[3]. As discussed in more detail below, the Plan contains the same types of programs, Technical Reference Manual ("TRM"), and Total Resource Cost ("TRC") Test that are employed for both the North and South Rate District Plans approved by the Pennsylvania Public Utility Commission ("Commission"). Though UGI Gas is not mandated to enact an EE&C Plan under Act 129 of 2008 ("Act 129"), UGI Gas's voluntary EE&C Plan was developed using the guiding principles of the Commission's Act 129 Phase III Implementation Order.[4]

Over the five years of the EE&C Plan, UGI Gas plans to spend $63.4 million on five energy efficiency programs and one CHP program.[5] Altogether, the EE&C Portfolio is cost-effective, providing $85.2 million in net resource benefits with a

[1] UGI Gas's fiscal year runs October 1st to September 30th.
[2] *See Pa. PUC v. UGI Utilities, Inc.*, Docket No. R-2015-2518438 (Order entered Oct. 14, 2016) ("*UGI Gas Division Order*").
[3] See *PA. PUC v. UGI Penn Natural Gas, Inc*., Docket No. R-2016-2580030 (Order entered August 31, 2017) ("*PNG Order*").
[4] *See Energy Efficiency and Conservation Program*, Docket No. M-2014-2424864 (Order entered June 19, 2015) ("*Phase III Implementation Order*"), *clarified*, Docket No. M-2014-2424864 (Order entered Aug. 20, 2015).
[5] All dollars are nominal unless otherwise noted.

TRC benefit-cost ratio ("BCR") of 1.51, which generally increases the economic wellbeing of UGI Gas's customers.

The five energy efficiency programs are projected to cost $59.9 million and save 1,279 BBtus of natural gas during the first five years of the Plan, and 25,458 BBtus of natural gas over the lifetime of the measures installed. From a total resource perspective, the present value of benefits is $138.7 million, with $75.2 million in present value of costs, leading to a present value of net benefits of $63.5 million and a TRC BCR of 1.84. Furthermore, the energy efficiency programs are expected to save 143,845 MWh of electricity, 299 million gallons of water, create between 764 and 1,527 jobs, and avoid the emission of CO_2 equivalent to over 26,971 cars being removed from the road.

UGI Gas is also proposing the investment of $3.4 million in a CHP program over five years. This program would provide net energy savings to customers over the five years of the Plan of 1,756 BBtus, and 26,336 BBtus over the lifetime of the CHP projects installed. The CHP program will provide present value of net benefits of $21.7 million from a total resource perspective, with a TRC BCR of 1.24.

1.2 Natural Gas and Energy Efficiency

Natural gas is an abundant resource and an important component of the Pennsylvania economy. In 2014, Pennsylvania had the most shale gas proven reserves in the country, driven by the development of the Marcellus Shale,[6] and over 90% of the natural gas UGI Gas delivers to its customers comes from the Marcellus Shale. As a result of this reliable, local supply, UGI Gas customers have seen utility bills that are approximately 40% lower than 2008.

Natural gas also has many important advantages as an end-use fuel source. When compared to the use of electricity generated from natural gas or most other fuels, the direct end-use of natural gas is more efficient and environmentally preferable. Natural gas has a source-to-site efficiency of 92%, meaning the vast majority of the energy from natural gas is associated with on-site consumption.

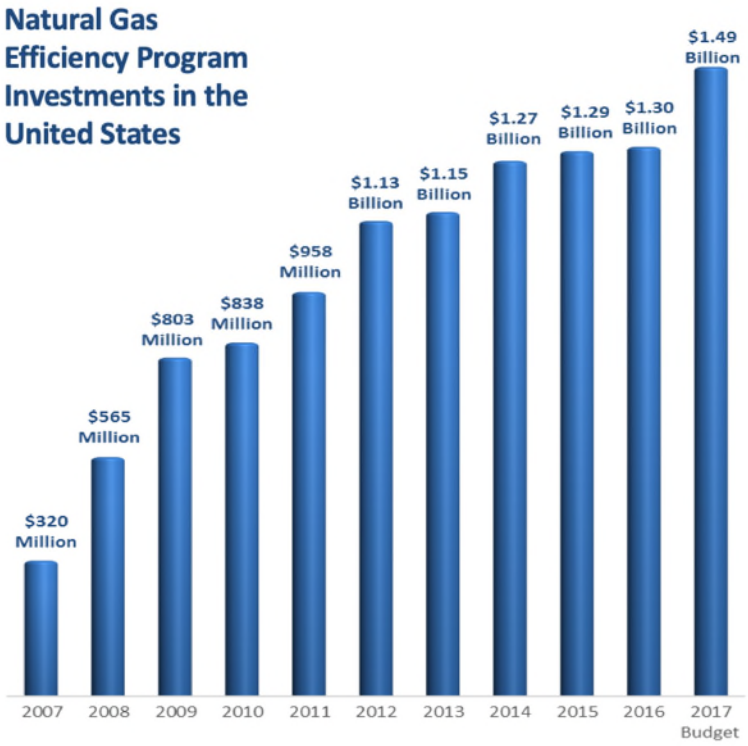
[6] http://marcelluscoalition.org/2015/11/pa-drives-increase-in-u-s-natural-gas-abundance/

Electricity on the other hand, only has a source-to-site efficiency of 32%, meaning that less than one third of generated electric energy is used at the site.[7]

As natural gas has continued to grow in importance as a fuel source, natural gas energy efficiency programs have also shown steady growth. According to the American Gas Association ("AGA"), spending has gone up significantly over the past decade, nearly tripling from $565 million in 2008 to $1.49 billion budgeted for 2017, as shown in

Figure 1. The AGA also estimates that natural gas utility energy efficiency programs saved 239 trillion Btu of energy and offset 12.5 million metric tons of carbon dioxide emissions in 2016. [8]

Figure 1. Growth of Natural Gas Energy Efficiency Program Spending[9]



The American Council for an Energy Efficient Economy ("ACEEE") State Energy Scorecard shows that spending on natural gas energy-efficiency programs

[7] Meyer, Richard. Dispatching Direct Use: *Achieving Greenhouse Gas Reductions with Natural Gas in Homes and Businesses*. American Gas Association: Washington, DC. November 11, 2015, p. 5.
[8] https://www.aga.org/globalassets/research--insights/reports/updated-energy-efficiency-slide-for-2018-aga-playbook.pptx
[9] https://www.aga.org/research/reports/natural-gas-efficiency-programs-2016-program-year/ .

has not just grown nationally, but also in the states surrounding Pennsylvania. New York has nearly tripled spending to $140 million between 2009 and 2017, and Maryland's spending increased from a few hundred thousand dollars annually in 2009 to $17 million in 2017.[10] Within Pennsylvania, a number of gas utilities have undertaken voluntary energy efficiency programs, including UGI Gas's North and South Rate Districts EE&C Plans and the second phase of Philadelphia Gas Works ("PGW") natural gas efficiency portfolio.

As the energy market is becoming increasingly customer driven, utilities around the country are recognizing the opportunity to drive economic growth and an efficient economy by sponsoring energy efficiency and conservation programs. For natural gas utilities, the opportunity to invest in helping customers save money, increase comfort, and reduce the impact they have on the environment is now a crucial component of joining the next generation of energy utilities and benefiting the communities that they serve.

[10] ACEEE (American Council for an Energy-Efficient Economy), *The 2018 State Energy Efficiency Scorecard*, Weston Berg, et al, October 2018, p. 36.

1.3 Goals

UGI Gas has the following core goals:

- Help its customers save energy cost-effectively through a holistic approach to energy efficiency and conservation;
- Avoid lost opportunities and provide deep levels of savings;
- Provide a wide range of services for its diverse customer base; and
- Contribute to the economic welfare of its customers and Pennsylvania.

In order to reach these goals, UGI Gas will utilize energy efficiency programs and a CHP program. For its energy efficiency programs, UGI Gas plans to invest approximately $59.9 million over five years with the goal of returning $63.5 million dollars in present value of total resource net benefits. As a secondary goal for efficiency programs, UGI Gas expects to save customers 25,458 BBtus of natural gas and 1.6 million tons of CO_2 emissions over the lifetime of installed measures during the five-year portfolio.

For the CHP program, UGI Gas plans to invest approximately $3.4 million over five years with the goal of returning $21.7 million dollars in present value of total resource net benefits.

1.4 Plan Development

The UGI Gas Consolidated EE&C Plan was developed based on the following principles:

1. Maintain continuity with the current UGI Gas EE&C Plans while leveraging experience gained from the past two years of EE&C Program activity to improve program design and projections;
2. Extend the EE&C Plan opportunities to include UGI Central (formerly UGI Central Penn Gas, Inc.) rate district customers.
3. Extend opportunities to larger nonresidential customers in the DS and LFD rate classes.

UGI Gas market information was gathered and characterized, including avoided costs for natural gas and electricity, demographic, building stock, and equipment market characteristics. These were combined with the measure and project characterizations from the UGI Gas EE&C Portfolio for cost-effectiveness screening using the TRC Test. The cost-effective measures and projects were then used to calculate achievable savings and participation levels based on experience with the two current UGI Gas EE&C Plans. The achievable scenario was adjusted to allow for program ramp up, and budget constraints to come up with a final portfolio.

The proposed programs are based on the Company's two current EE&C Plans, with some updates based on lessons learned from previous program experience. Updates to program offerings include the combination of the Nonresidential New Construction and the Nonresidential Retrofit Program into the Nonresidential Custom Program and the decision not to include the Behavior and Education Program. The following table provides an overview of the proposed programs.

Table 1. Proposed Programs

Proposed Program	Existing Program	Disposition	Modifications
	Residential Programs		
Residential Prescriptive (RP)	Residential Prescriptive (RP)	Continued	Updated Projections
Residential New Construction (RNC)	Residential New Construction (RNC)	Continued	Updated Projections
Residential Retrofit (RR)	Residential Retrofit (RR)	Modified	Direct Install Component Added, Updated Projections
None	Behavior and Education (BE)	Discontinued	No longer included in Plan.
	Nonresidential Programs		
Nonresidential Prescriptive (NP)	Nonresidential Prescriptive (NP)	Continued	Updated Projections and Measures
Nonresidential Custom (NC)	Nonresidential Retrofit (NR)	Modified	Renamed and Added New Construction track, Updated Projections
Nonresidential Custom (NC)	Nonresidential New Construction (NNC)	Modified	Merged into NC Program
Combined Heat and Power (CHP)	Combined Heat and Power (CHP)	Continued	Updated Projections

1.4.1 Settlement Provisions from Previous Plans

The following settlement items from previous plans were adhered to in the development of the plan:

- All appliances and equipment qualifying for rebates or incentives under the EE&C plan must meet or exceed U.S. Department of Energy “EnergyStar” Minimum Standards to the extent such standards exist.
- UGI Gas will submit an annual report in January, approximately three months after the end of a program year. UGI Gas shall also hold an annual stakeholder meeting (Parties to this proceeding and other entities that express interest) to review and discuss the EE&C Plan’s progress, as well as receive input from stakeholders on potential modifications to the EE&C

Plan, if any. Each annual stakeholder meeting shall be held: (1) at a time and place chosen by UGI Gas; and (2) within three months after UGI Gas submits its EE&C Plan annual report to the Commission. UGI Gas will provide a copy of its annual EE&C Plan report to the stakeholders at the time it is submitted to the Commission and will review and discuss the report at the stakeholder meeting.

- UGI Gas will include total resource cost test evaluations with and without the economic effects of carbon taxes and DRIPE in the evaluations of the cost effectiveness of the programs.
- UGI Gas will continue to coordinate with PA Housing Alliance and PA Housing Finance Agency and will continue to track participation for buildings with more than one unit.
- UGI Gas will continue to refer potentially eligible customers to its Low-income Usage Reduction Program ("LIURP") and will include LIURP messaging on applications and marketing materials, including a direct phone number to contact UGI Gas to pursue enrollment if the customer believes that they may qualify.
- UGI Gas will, over the five-year term of the EE&C Plan, limit recoverable utility costs (including incentives, program administration, marketing, inspections and evaluation but excluding portfolio wide costs) for the NP and NC to 55 percent of the overall aggregated TRC costs for the NP and NC programs. Grant funding will be considered a source of participant funding. To the extent that UGI Gas deems that utility contributions in excess of 55 percent of overall program costs are required to achieve UGI Gas's desired participation levels, UGI Gas may voluntarily make the necessary contributions without EE&C cost recovery.
- The Company will not seek to recover in rates EE&C administrative costs in excess of the projections included in its filing.

Settlement provisions regarding the separation of residential and nonresidential new construction programs are no longer relevant, due to the updated program design.

Settlement provisions related to spending caps and benefit-cost ratios are no longer relevant due to updated projections and cost-effectiveness projections. Overall, spending was still restricted by a ceiling of 2% of revenue (approximately $17 million per year), which is in-line with Act 129 spending limits, and the overall portfolio has a TRC BCR greater than 1.0.

1.5 Total Plan Costs

The following table provides an overview of the spending by year and program for the total EE&C Plan. The maximum spend in a year is $13.9 million in FY 2024, approximately 1.5% of UGI Gas's FY 2019 budgeted revenues. This level is well under the 2% cap that Act 129 imposes on electric efficiency programs in Pennsylvania.[11]

Table 2. Projected Spending for Consolidated EE&C Plan by Program

Program	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY '20-'24
EE&C Total	**$10,349,050**	**$12,093,350**	**$13,127,500**	**$13,896,100**	**$13,903,600**	**$63,369,600**
Residential Prescriptive (RP)	5,030,900	5,833,900	6,364,100	6,574,900	6,494,900	30,298,700
Residential New Construction (RNC)	837,800	584,200	2,083,700	2,143,700	2,083,700	7,733,100
Residential Retrofit (RR)	1,521,000	2,068,000	664,000	604,000	604,000	5,461,000
Nonresidential Prescriptive (NP)	848,350	1,008,450	995,700	1,055,700	995,700	4,903,900
Nonresidential Custom (NC)	601,000	1,063,800	1,460,000	1,932,800	1,872,800	6,930,400
Portfolio-wide Costs	875,000	900,000	925,000	950,000	950,000	4,600,000
EE Total	**9,714,050**	**11,458,350**	**12,492,500**	**13,261,100**	**13,001,100**	**$59,927,100**
CHP Program	635,000	635,000	635,000	635,000	902,500	3,442,500

The following table provides the combined budgets for the EE programs and CHP Program by category for FY 2020, which is used as the reference year in UGI Gas's rate case filing.

Table 3. FY 2020 Budgets by Rate Class and Category

Program Category	R/RT	N/NT	DS	LFD	Total
Customer Incentives	$5,717,700	$527,175	$619,023	$408,153	$7,272,050
Administration	$1,975,770	$213,115	$179,180	$93,934	$2,462,000
Marketing	$258,000	$43,500	$50,450	$33,050	$385,000
Inspections	$137,000	$9,000	$8,800	$5,200	$160,000
Evaluation	$40,000	$0	$15,000	$15,000	$70,000
Total Expenses	**$8,128,470**	**$792,790**	**$872,453**	**$555,337**	**$10,349,050**

[11] *See* 66 Pa.C.S. § 2806.1(g) (limiting the total cost of an EDC's EE&C Plan to 2% of the EDC's total annual revenue as of December 31, 2006).

1.6 Efficiency Program Costs and Benefits

1.6.1 Efficiency Program Costs

The following table provides an overview of the spending by year and by sector on the EE programs. The EE programs will cost approximately $12.1 million per year over the five-year life of the EE&C Plan.

Table 4. Projected Efficiency Portfolio Budgets by Sector

Sector	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY '20- '24
Nominal	**$9,714,050**	**$11,458,350**	**$12,492,500**	**$13,261,100**	**$13,001,100**	**$59,927,100**
Residential	$8,128,470	$9,215,096	$9,838,382	$10,045,768	$9.906,737	**$47,134,454**
Nonresidential	$1,585,580	$2,243,254	$2,654,118	$3,215,332	$3,094,363	**$12,792,646**

The following table shows the projected efficiency budgets by program.

Table 5. Projected Efficiency Portfolio Budgets by Program

Program	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY '20-'24
EE Total	**9,714,050**	**11,458,350**	**12,492,500**	**13,261,100**	**13,001,100**	**59,927,100**
Residential Prescriptive (RP)	5,030,900	5,833,900	6,364,100	6,574,900	6,494,900	30,298,700
Residential New Construction (RNC)	837,800	584,200	2,083,700	2,143,700	2,083,700	7,733,100
Residential Retrofit (RR)	1,521,000	2,068,000	664,00	604,000	604,000	5,461,000
Nonresidential Prescriptive (NP)	848,350	1,008,450	995,700	1,055,700	995,700	4,903,900
Nonresidential Custom (NC)	601,000	1,063,800	1,460,000	1,932,800	1,872,800	6,930,400
Portfolio-wide Costs	875,000	900,000	925,000	950,000	950,000	4,600,000

The portfolio-wide cost lines from the previous table are costs that apply to all programs in the EE portfolio. They are costs incurred at the portfolio level for program development, design, tracking, reporting, and administrative overhead. Development costs for the portfolio occur in the first year as programs are designed and reporting infrastructure is put in place. Costs then fall sharply in the second year before climbing as the portfolio grows. In the final year, the portfolio wide costs represent 7% of the portfolio total cost, and, over the five-year period, they represent 8% of the portfolio's costs. The following table provides a portfolio-level look at costs by category.

Table 6. Projected Efficiency Portfolio Budgets by Category

Category	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY '20-'24
EE Total	**$9,714,050**	**$11,458,350**	**$12,492,500**	**$13,261,100**	**$13,001,100**	**$59,927,100**
Customer Incentives	6,772,050	7,885,350	9,349,500	9,810,100	9,810,100	43,627,100
Administration	2,402,000	2,840,000	2,523,000	2,611,000	2,611,000	12,987,000
Marketing	345,000	373,000	363,000	373,000	373,000	1,827,000
Inspections	155,000	190,000	197,000	207,000	207,000	956,000
Evaluation	40,000	170,000	60,000	260,000	0	530,000

1.6.2 Natural Gas Savings

The following tables provide projected natural gas savings by program and sector for the energy efficiency programs in the EE&C Portfolio.

Table 7. Projected First Year Gas Savings by Program (MMBtus)

Program	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY '20-'24
Portfolio Total	**204,704**	**233,603**	**271,51**	**284,864**	**284,864**	**1,279,546**
Residential Prescriptive (RP)	107,515	123,609	136,827	139,642	139,642	647,234
Residential New Construction (RNC)	20,623	9,377	39,185	39,185	39,185	147,555
Residential Retrofit (RR)	17,325	24,340	5,423	5,423	5,423	57,933
Nonresidential Prescriptive (NP)	48,350	54,847	57,209	57,209	57,209	274,825
Nonresidential Custom (NC)	10,890	21,431	32,866	43,406	43,406	152,000

Table 8. Projected Lifetime Gas Savings by Program (MMBtus)

Program	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY '20-'24
Portfolio Total	**4,057,020**	**4,610,820**	**5,419,745**	**5,685,106**	**5,685,106**	**25,457,796**
Residential Prescriptive (RP)	2,081,972	2,393,590	2,649,411	2,703,966	2,703,966	12,532,905
Residential New Construction (RNC)	412,451	187,534	783,703	783,703	783,703	2,951,094
Residential Retrofit (RR)	296,969	415,413	92,113	92,113	92,113	988,721
Nonresidential Prescriptive (NP)	1,047,823	1,185,671	1,237,197	1,237,197	1,237,197	5,945,086
Nonresidential Custom (NC)	217,806	428,612	657,320	868,126	868,126	3,039,990

Table 9. Projected Gas Savings by Sector (MMBtus)

Sector	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY '20-'24
First Year Gas Savings	**204,704**	**233,603**	**271,510**	**284,864**	**284,864**	**1,279,546**
Residential	145,463	157,325	181,435	184,249	184,249	**852,722**
Nonresidential	59,241	76,278	90,075	100,615	100,615	**426,824**
Lifetime Gas Savings	**4,057,020**	**4,610,820**	**5,419,745**	**5,685,106**	**5,685,106**	**25,457,796**
Residential	2,791,392	2,996,538	3,525,227	3,579,782	3,579,782	**16,472,720**
Nonresidential	1,265,629	1,614,282	1,894,518	2,105,324	2,105,324	**8,985,076**

1.6.3 Electric Savings

The following table shows electric savings for measures installed under the energy efficiency programs in the EE&C Portfolio. The electric savings are

secondary savings from measures that primarily save natural gas, such as air-conditioning savings from higher insulation.

Table 10. Projected Electric Savings by Sector

Sector	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY '20-'24
First Year Energy (MWh)	**1,607**	**604**	**1,763**	**1,775**	**1,775**	**7,524**
Residential	1,546	529	1,674	1,675	1,675	**7,099**
Nonresidential	61	75	89	100	100	**425**
Lifetime Energy (MWh)	**30,849**	**10,513**	**34,002**	**34,240**	**34,240**	**143,845**
Residential	29,977	9,380	32,611	32,629	32,629	**137,227**
Nonresidential	871	1,133	1,391	1,611	1,611	**6,618**
Summer Peak (kW)	**647**	**158**	**511**	**523**	**523**	**2,361**
Residential	629	128	464	464	464	**2,148**
Nonresidential	18	30	47	59	59	**213**

1.6.4 Water Savings

This section contains ancillary water savings from gas efficiency measures that also save water, such as low-flow faucet aerators and showerheads.

Table 11. Projected Water Savings by Sector (Million Gallons)

Sector	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY '20-'24
First Year Water Savings	**4.62**	**5.55**	**3.92**	**3.92**	**3.92**	**21.93**
Residential (R/RT)	1.59	2.26	0.51	0.51	0.51	**5.37**
Nonresidential (N/NT)	3.03	3.30	3.41	3.41	3.41	**16.56**
Lifetime Water Savings	**60.96**	**71.49**	**55.61**	**55.61**	**55.61**	**299.29**
Residential (R/RT)	15.91	22.59	5.09	5.09	5.09	**53.77**
Nonresidential (N/NT)	45.05	48.90	50.52	50.52	50.52	**245.52**

1.6.5 Emission Reductions

This section contains projections for CO_2 emission reductions due to the energy efficiency programs. The total savings of 1.6 million tons of CO_2 is equivalent to removing 26,971 cars off the road. The following table breaks out the emission reductions due to gas savings and electric savings. While the emissions reductions are projected below, the main TRC test for the portfolio does not include any value for these emissions reductions.

Table 12. Projected CO_2 Emission Reductions by Energy Source (Short Tons)

Sector	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY '20-'24
First Year Reductions	**13,323**	**14,172**	**17,361**	**18,153**	**18,153**	**81,163**
From Gas Savings	11,975	13,666	15,883	16,665	16,665	**74,853**
From Electric Savings	1,348	507	1,478	1,489	1,489	**6,309**
Lifetime Reductions	**263,202**	**278,548**	**345,566**	**361,289**	**361,289**	**1,609,895**
From Gas Savings	237,336	269,733	317,055	332,579	332,579	**1,489,281**
From Electric Savings	25,867	8,815	28,511	28,711	28,711	**120,614**

1.6.6 Job Creation

Investing in cost-effective energy efficiency creates jobs in two ways, one direct and the other indirect, as discussed in a 2012 white paper from the ACEEE.[12] Direct job creation results from hiring related to implementing the programs. Indirect job creation results from the substitution of capital spent on natural gas with capital spent in the local economy. Additional jobs are created by the indirect or income effect from cost-effective energy efficiency investment. Further, the net economic benefits from efficiency investment reduce household and business gas bills and raise household disposable incomes and business profitability. Customers will tend to spend most of this additional money and save the rest. This additional spending creates a "multiplier" effect through the cycle of re-spending of the initial cost savings, which stimulates aggregate demand for goods and services. Satisfying increased demand for goods and services requires more labor. While some of the jobs created leak into the broader U.S. and global economy, a good portion (possibly higher than 80%) of jobs created due to energy efficiency stay within the Commonwealth. The approach of looking at net job creation through both direct means and with economic multiplier effects is endorsed in the 2012 white paper from ACEEE.[13]

[12] "Energy Efficiency Job Creation: Real World Experiences" Bell, Casey J. American Council for an Energy-Efficiency Economy. October 2012.
[13] Energy Efficiency Job Creation: Real World Experiences" Bell, Casey J. American Council for an Energy-Efficiency Economy. October 2012.

The number of jobs created from investments in energy efficiency directly relates to the total resource value of the energy that these measures save. Studies of employment impacts of Demand Side Management ("DSM") use energy savings as a surrogate for total resource value. A meta-study of U.S. data found that estimates for the number of jobs created had a wide range, but that most studies estimate that between 30 and 60 net jobs are created by saving one TBtu.[14] In New York, New Jersey, and Pennsylvania, the ACEEE projected that 164,320 jobs, or 59 for every TBtu saved, could be attributed to EE in 1997 through 2010.[15]

As shown in the following table, UGI Gas estimates that its gas energy efficiency programs portfolio will generate between 764 and 1,527 net additional jobs over the lifetime of the efficiency measures installed over the next five-years. This range is based on assuming that each TBtu of gas savings creates between 30 and 60 full-time equivalent jobs in Pennsylvania.

Table 13. Estimated Job Creation due to Energy Efficiency Programs

	30 Jobs/TBtu	40 Jobs/TBtu	50 Jobs/TBtu	60 Jobs/TBtu
RESIDENTIAL PROGRAMS				
FY 2020	84	112	140	167
FY 2021	90	120	150	180
FY 2022	106	141	176	212
FY 2023	107	143	179	215
FY 2024	107	143	179	215
TOTAL	**494**	**659**	**824**	**988**
NON-RESIDENTIAL PROGRAMS				
FY 2020	38	51	63	76
FY 2021	48	65	81	97
FY 2022	57	76	95	114
FY 2023	63	84	105	126
FY 2024	63	84	105	126
TOTAL	**270**	**359**	**449**	**539**
TOTAL PORTFOLIO				
FY 2020	122	162	203	243
FY 2021	138	184	231	277
FY 2022	163	217	271	325
FY 2023	171	227	284	341
FY 2024	171	227	284	341
TOTAL	**764**	**1,018**	**1,273**	**1,527**

[14] Laitner, Skip, and Vanessa McKinney. June 2008. *Positive Returns: State Energy Efficiency Analyses Can Inform U.S. Energy Policy Assessments*. Washington, D.C.: American Council for an Energy Efficiency Economy.

[15] Nadel, Steven, Skip Laitner, Marshall Goldberg, Neal Elliott, John DeCicco, Howard Geller, and Robert Mowris. 1997. *Energy Efficiency and Economic Development in New York, New Jersey, and Pennsylvania. Washington, D.C.*: American Council for an Energy Efficiency Economy.

1.7 CHP Program Costs and Benefits

The following table provides the annual projected budget for the CHP Program in nominal dollars.

Table 14. Projected CHP Program Budgets

Spending	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY '20-'24
Nominal	$635,000	$635,000	$635,000	$635,000	$902,500	**$ 3,442,500**

The following table provides the net primary energy savings installed annually for the CHP Program.

Table 15. Projected Net Primary Energy Savings from CHP (MMBtus)

Savings	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY '20-'24
First Year	339,710	339,710	339,710	339,710	396,905	**1,755,747**
Lifetime	5,095,656	5,095,656	5,095,656	5,095,656	5,953,578	**26,336,203**

The following table provides the net CO_2 emission reductions due to the CHP Program.

Table 16. Net CO_2 Emission Reductions due to CHP (Short Tons)

Savings	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY '20-'24
First Year	34,154	34,154	34,154	34,154	39,907	**176,524**
Lifetime	512,315	512,315	512,315	512,315	598,603	**2,647,862**

1.8 Cost-Effectiveness Analysis

The following table provides cost-effectiveness projections for the EE&C Portfolio using the TRC Test, which is the primary metric by which UGI Gas evaluates the EE&C Plan.

Table 17. TRC Cost-effectiveness Summary of EE&C Portfolio (2018$)

Program	Total Resource PV Benefits	Total Resource PV Costs	Total Resource PV Net Benefits	Total Resource BCR
EE&C Total	**$252,455,031**	**$167,244,505**	**$85,210,527**	**1.51**
Residential Prescriptive (RP)	66,906,943	36,799,435	30,107,508	1.82
Residential New Construction (RNC)	18,038,897	8,754,545	9,284,352	2.06
Residential Retrofit (RR)	6,153,839	5,617,549	536,290	1.10
Nonresidential Prescriptive (NP)	30,824,692	8,147,406	22,677,285	3.78
Nonresidential Custom (NC)	16,816,997	12,415,806	4,401,191	1.35
Portfolio-wide Costs	0	3,511,529	-3,511,529	0.00
EE Total	**138,741,368**	**75,246,271**	**63,495,096**	**1.84**
CHP Program	113,713,664	91,998,234	21,715,430	1.24

While the portfolio is cost-effective using the primary TRC Test, if the values for demand-response induced pricing effects ("DRIPE") and internalized market prices for carbon dioxide ("CO_2") are included, the portfolio shows substantially more benefits. In particular, net benefits for the CHP Program are $117.3 million, more than six times the net benefits calculated using the primary TRC Test. Energy efficiency programs' TRC net benefits increase by more than 60 percent to $102.1 million, and the TRC BCR for the entire EE&C portfolio goes from 1.51 to 2.31.

Table 18. TRC Cost-effectiveness Summary of EE&C Portfolio (2018$) including DRIPE and CO_2

Program	Total Resource PV Benefits	Total Resource PV Costs	Total Resource PV Net Benefits	Total Resource BCR
EE&C Total	**$386,666,839**	**$167,244,505**	**$ 219,422,334**	**2.31**
Residential Prescriptive (RP)	86,025,637	36,799,435	49,226,202	2.34
Residential New Construction (RNC)	22,540,336	8,754,545	13,785,791	2.57
Residential Retrofit (RR)	7,658,120	5,617,549	2,040,571	1.36
Nonresidential Prescriptive (NP)	39,700,986	8,147,406	31,553,580	4.87
Nonresidential Custom (NC)	21,457,045	12,415,806	9,041,239	1.73
Portfolio-wide Costs	0	3,511,529	-3,511,529	0.00
EE Total	**177,382,125**	**75,246,271**	**102,135,853**	**2.36**
CHP Program	209,284,714	91,998,234	117,286,481	2.27

1.8.1 Cost-Effectiveness Analysis Methodology

The cost-effectiveness results reported in the Plan followed standard industry practices for utilizing the TRC Test for cost-effectiveness. The TRC Test methodology used is the same as that used by the Company in its current EE&C Plans for the North and South Rate Districts. To calculate benefits, projected natural gas, electricity, and water savings are multiplied by avoided costs, and this stream of future values is discounted to the present. For measures that have an increase in resource usage, such as CHP projects, the increase in usage may offset some, or all, of the positive benefit derived from resource savings. The cost side of the test consists of the present value of all incremental costs incurred by participants, including net operation and maintenance costs, and the non-incentive costs incurred by the portfolio administrator. If the benefits outweigh the costs (the benefit-cost ratio is above one), then the total cost of energy services for an average customer within the territory will fall and the portfolio is considered cost effective. Results for the Program Administrator Cost ("PAC") test are also included. The PAC only includes the costs for program administration and incentives, not additional customer costs. Since UGI Gas is a natural gas utility, the benefits for the PAC test are the natural gas savings. As per paragraph 41 of the UGI Gas Division rate case settlement, UGI Gas will present the results of the TRC Test with and without the value of DRIPE and CO_2.

The analysis used a real discount rate ("RDR") of 5.43%. The RDR was calculated using an assumption of a nominal discount rate ("NDR") of 7.54%, based on UGI Gas's weighted average cost of capital ("WACC"), and an inflation rate of 2.0%.

1.8.2 Avoided costs

UGI Gas developed avoided costs consistent with its current EE&C Plans, with some adjustments to account for the entirety of the consolidated utility territory. The costs of baseload and peaking capacity were included (paralleling

the inclusion of generation capacity in the electric avoided costs), along with avoidable local distribution costs.

The avoided costs for baseload were computed as the cost of the Transco FT contract, plus commodity priced at Transco Zone 4, using futures pricing from November 9, 2018. Futures prices were blended with 2018 Annual Energy Outlook ("AEO") values through 2030, and the Annual Energy Outlook projections were used thereafter. To slow the transition to the AEO prices, blending was based on the cube root (the ⅓ power) of the ratio of open contracts in each year to the open contracts for 2019.

The avoided costs for heating load were computed as the commodity costs of the projected Henry Hub price, minus the basis to Transco Zone 4, plus the commodity charge and gas retention from the Transco FT tariff. This was then combined with capacity costs for a typical marginal peaking contract, computed as the capacity-weighted average annual charge in dollar per peak dekatherm ("dth") for the five most expensive peaking contracts from UGI Energy Services, of $222/dth. This capacity is applied to the contribution of the load-weighted design-day peak, equivalent to 74.2 HDD, and divided over the annual heating load, which averages about 5,665 HDD.

Avoided transmission and distribution, demand-reduction induced price effect ("DRIPE") and internalized market price of carbon dioxide ("CO_2") were unchanged from the original South EE&C Plan Filing.

Evaluation of some gas-efficiency programs and CHP also requires estimates of avoided electric costs. Electric avoided costs were taken directly from the analysis performed by the Statewide Evaluator ("SWE"), and utilizes a blend of 50% PPL Electric Utilities Corporation, 25% FirstEnergy – Penelec, and 25% FirstEnergy - MetEd, the major electric distribution companies ("EDCs") whose service territories overlap with UGI Gas's service territory, restated to constant 2018 dollars.[16] Both the electric and gas avoided costs are also provided with the

[16] Act 129 SWE Distributed Generation Potential Study, Docket No. M-2014-2424864 (February 13, 2015).

benefits of reduced supply prices and the internalized market price for carbon emissions included. A table showing the annual values for gas and electric avoided costs is included in Appendix 3.1.

1.9 Implementation

1.9.1 Program Staging

All programs are projected to be operating by October 1, 2019, since all the programs currently exist already as part of the Company's two existing gas EE&C Plans. However, programs may have some ramp up time due to the addition of customers in the current Central Rate District who do not currently have access to a gas EE&C Plan. Under the Consolidated EE&C Plan, eligible customers in the UGI Central Rate District will be allowed to participate upon the effective date of new rates.

1.9.2 Marketing

General Awareness and Branding

UGI Gas will leverage much of the already established existing marketing infrastructure. This will create cost-effective and consistent messaging regarding UGI Gas's efficiency and conservation efforts. Marketing efforts may include, but not be limited to, www.ugi.com/savesmart, print, radio and digital advertisements, along with billboards, social media, bill inserts and trade ally outreach. Once a customer reaches the website, the customer will be funneled towards appropriate programs and incentives through targeted links. While the website will be a primary component of marketing the Plan, it will also be supplemented with additional marketing collateral such as flyers and application forms.

Multi-family Outreach

UGI Gas will market directly to residential multi-family customers and multi-family new construction, including master-metered multifamily residences. These efforts will focus on residents, landlords, and management companies, regardless of the rate class structure of the property. In addition, efforts will be made to

coordinate with the Pennsylvania Housing Alliance and the Pennsylvania Housing Finance Agency.

Low-income Customers

Customers who contact UGI Gas or its Conservation Service Providers ("CSPs") with interest in participating in the EE&C Plan will be informed that they might qualify for the Low-Income Usage Reduction Program ("LIURP") if they are income qualified. Any interested customers will be referred to UGI Gas's LIURP.

Targeted Outreach and Partnerships

UGI Gas will continue to leverage and enhance partnerships with trade allies. These efforts are likely to be the best way to drive nonresidential participation. Successful activities involve all sectors within the community and may include as activities such as:

- Partnering with local businesses and trade organizations (builders, contractors, plumbers, HVAC service providers, equipment suppliers, etc.) to familiarize them with program opportunities, energy efficiency practices and implementation requirements and to utilize them, where appropriate, as one of the program's service delivery channels.
- Targeting equipment manufacturers, distributors, installation contractors and retailers/vendors to make sure they offer high-efficiency equipment and can make customers aware of available incentives.
- Connecting with local business organizations to provide opportunities to address their specific needs and translate them to their tenants, management, and facility operations personnel.
- Working with administrators of Act 129 EDCs' EE&C Plans to combine marketing and delivery options and address all aspects of efficiency at the same time.

1.9.3 Administration

The table below describes the main roles in the management of the EE&C Plan.

Table 19. Overview of Administration Roles

Role	Description
Plan Administrator	Primarily responsible for program and portfolio planning, management and reporting. Supervises and manages all other roles.
Implementation and Design Consultants	Provides assistance in the design and implementation on multiple aspects of the portfolio, including, but not limited to, program design, reporting, marketing, and training. UGI Gas will leverage internal resources wherever possible to provide these services.
Implementation Contractor	Directly responsible for main aspects of program delivery, including but not limited to, customer engagement and retention, technical assistance, measure installation, rebate processing, program tracking, and reporting.
Third-party Inspector	Responsible for measure and project inspections separately from the implementation contractor.
Evaluator	Performs independent program and portfolio evaluations that are used to verify savings and guide future plans.

1.9.4 Reporting

UGI Gas will submit an annual report on the EE&C Plan each January, three months after the close of the program year. This report will provide information on activity for the previous year and progress towards five-year goals, including, but not limited to:

- First year and lifetime savings;
- Participation;
- Spending;
- Cost-effectiveness;
- Highlights of portfolio and program activity; and
- Updates to program delivery and design.

In order to tie savings and costs together as effectively as possible, results will be reported based on commitments made. UGI Gas will also report on any participation by buildings with more than one unit.

1.9.5 Program Flexibility

To make sure that the EE&C Portfolio is able to address changing market conditions and improve service delivery as quickly as possible, UGI Gas requires flexibility in the allocation of budgets and implementation of program improvements. This plan document provides the principles and five-year goals that UGI Gas is seeking, but certain adjustments, such as providing incentives for new measures or moving budgets between years and programs, may be required to meet these goals. UGI Gas will include any such adjustments in its annual report but does not anticipate seeking initial approval for such updates. However, UGI Gas will file an updated EE&C Plan in anticipation of material changes that may have a serious effect on five-year goals, such as:

- The addition or removal of a program;
- A need for total funding levels above those approved for the five-year period; and
- Significant changes to cost-effectiveness projections, such as an update to avoided costs or a large reduction in portfolio spending projections.

1.9.6 Technical Reference Manual

To maintain consistency with existing gas efficiency programs in Pennsylvania, UGI Gas will utilize the same Technical Reference Manual ("TRM") that is currently used in the Company's existing gas EE&C Plans. Any results from program evaluations that affect deemed savings calculations will be added to the TRM and provided in annual report filings.

1.9.7 Tracking System

UGI Gas will require that CSPs collect all relevant customer, application, measure, and contractor information and that this data is provided to UGI Gas in a timely fashion. UGI Gas will in turn maintain a program and portfolio-level aggregation of this information to be used for program management and assessment, as well as for annual reporting.

1.9.8 Third-party inspections

Each program will have a third-party inspector, separate from the contractor that performed the work, who will solicit customer feedback and will examine whether the work was done properly and whether the installed measures match the application data. Inspections for large, complex, and custom projects will be mandatory. Inspection rates for prescriptive programs will be designed to gather a statistically significant sample of program activity. See individual program plans for additional details.

1.9.9 Evaluation, Measurement, and Verification

UGI Gas will monitor the ongoing progress of the EE&C Plan to provide the highest possible service to customers, while maintaining rigorous processes and controls to ensure that savings and costs are being properly accounted for. UGI Gas will closely track program data, perform independent inspections of completed projects, and perform periodic evaluations for all programs.

UGI Gas will evaluate each of its programs once adequate participation levels have been reached and a full 12 months of post-participation billing data has been collected. The programs may be evaluated again after another two years have passed. As part of the initial program development, UGI Gas will work with the selected evaluator to establish the methodology and goals of the process evaluation. Initial objectives include:

- Verifying energy savings and associated costs;
- Assessing market attitudes towards the program, including contractors, customers, and efficient equipment suppliers; and
- Measuring the effectiveness of current program design, marketing, and service delivery.

The evaluation section of the individual program descriptions includes additional details on evaluation schedules and goals unique to that program.

2 Program Plans

2.1 Residential Prescriptive

Objective

The Residential Prescriptive (RP) program is designed to overcome market barriers to energy efficient space and water heating equipment in the residential sector through rebates and customer awareness. The objective of the program is to avoid lost opportunities by encouraging consumers to install the most efficient gas heating technologies available when replacing older, less efficient equipment. The program also aims to strengthen UGI Gas's relationship with HVAC contractors, suppliers, and other trade allies.

Eligible Rate Class

R/RT, N/NT

Cost Effectiveness

Five-Year Cost-Effectiveness Results (2018$)

CE Test	PV Benefits	PV Costs	PV Net	BCR
TRC Test	$ 66,906,943	$ 36,799,435	$ 30,107,508	1.82
Gas Admin Test	$ 66,740,097	$ 22,995,133	$ 43,744,963	2.90

Savings Projections

Five-Year Savings Projections

	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY '20-'24
Natural Gas (MMBtus)						
First Year	107,515	123,609	136,827	139,642	139,642	**647,234**
Lifetime	2,081,972	2,393,590	2,649,411	2,703,966	2,703,966	**12,532,905**
Electric Energy (kWh)						
First Year	64,784	74,399	82,419	84,038	84,038	**389,677**
Lifetime	712,620	818,387	906,613	924,416	924,416	**4,286,451**

	Peak (kW)	-	-	-	-	-	-
	Water (Gallons)						
	First Year	-	-	-	-	-	-
	Lifetime	-	-	-	-	-	-

Budget Projections

Five-Year Budgets (Nominal)

Category	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY '20-'24
Customer Incentives	$4,675,900	$5,378,900	$5,953,100	$6,078,900	$6,078,900	**$28,165,700**
Administration	151,000	159,000	166,000	167,000	167,000	**810,000**
Marketing	123,000	134,000	143,000	145,000	145,000	**690,000**
Inspections	81,000	92,000	102,000	104,000	104,000	**483,000**
Evaluation	-	70,000	-	80,000	-	**150,000**
Total	**$5,030,900**	**$5,833,900**	**$6,364,100**	**$6,574,900**	**$6,494,900**	**$30,298,700**

Participation Projections

Five-Year Participation Projections

Measure	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY '20-'24
Furnace - ENERGY STAR	4,392	5,024	5,567	5,655	5,655	**26,293**
Boiler - (94+ AFUE)	330	378	418	426	426	**1,978**
Combi Boiler - (94+ AFUE)	1,035	1,201	1,327	1,365	1,365	**6,293**
Smart Thermostat – ENERGY STAR	2,722	3,126	3,463	3,531	3,531	**16,373**
Tankless Water Heater - ENERGY STAR	648	748	828	849	849	**3,922**
Total	**9,127**	**10,477**	**11,603**	**11,826**	**11,826**	**54,859**

Program Design

The RP program follows the same design as the current UGI North and UGI South programs of the same name. The same measures from the current program are also included; however, incentive levels were adjusted to reflect updated incremental cost data.

	The RP program offers rebates for qualifying residential-sized space and water heating equipment. Customer rebates can be issued via mail or in the form of an instant rebate issued by qualified participating contractors or equipment distributors. Customers will be made aware of opportunities through traditional marketing efforts, such as bill inserts and media advertisements, as well as from installation contractors. For most measures, customers will have a contractor install the measure and receive a cash rebate to offset most of the incremental cost of the higher efficiency equipment. Smaller measures, such as Wi-Fi enabled thermostats, will only require a valid proof of purchase before a cash rebate is issued. UGI Gas will continue to examine other equipment for potential inclusion in the program, as well as the relative market adoption of equipment already receiving incentives. If program funds begin to run low in a given year, incentive levels may be lowered, or equipment removed from the program if additional budget adjustments cannot be made. UGI Gas will aim to provide as little interruption to customers as possible due to such adjustments.
Target Market and End Uses	The RP targets residential and small commercial consumers who use natural gas to heat their homes and/or generate hot water. In general, the program aims to incentivize only the highest levels of efficient equipment on the market. The minimum level of efficiency for measures offered through the RP program will be ENERGY STAR®, when available, and in some cases may exceed ENERGY STAR®.

	On the space heating side, the program provides incentives for ENERGY STAR® labeled smart thermostats, furnaces, high efficiency boilers, and combination boilers. ENERGY STAR® smart thermostats offer the potential for deeper savings than traditional programmable thermostats due to the wide range of features and feedback they offer. ENERGY STAR® requirements for furnaces drive customers toward the highest efficiency tier of condensing units (95+ AFUE) and require efficient fans that save electricity. The program would also require boilers to go towards the highest efficiency tier with an AFUE of at least 94. Finally, offering incentives for combination space and water heating boilers addresses two types of end-use with one piece of equipment. These “combi boilers” also address issues with orphaned water heaters having existing atmospheric venting systems that are no longer adequate, when switching to condensing heating equipment. The program also addresses water heating savings by offering incentives for ENERGY STAR® tankless water heaters.

<table>
<tr><td>Financial Incentives</td><td>Incentives were designed to be in line with other offerings in the region and/or cover approximately two-thirds of the incremental cost of the measure. The table below lists the proposed incentive schedule.

Proposed Residential Prescriptive Program Rebates (Nominal)

<table>
<tr><th>Equipment</th><th>Minimum Efficiency</th><th>Proposed Incentive</th><th>Maximum Incentive</th></tr>
<tr><td>Smart Thermostat</td><td>ENERGY STAR®</td><td>$100</td><td>$100</td></tr>
<tr><td>Furnace</td><td>ENERGY STAR®</td><td>$500</td><td>$500</td></tr>
<tr><td>Boiler</td><td>94+ AFUE</td><td>$1,200</td><td>$1,500</td></tr>
<tr><td>Combi Boiler</td><td>94+ AFUE</td><td>$1,500</td><td>$1,800</td></tr>
<tr><td>Tankless Water Heater</td><td>ENERGY STAR®</td><td>$400</td><td>$400</td></tr>
</table>
All equipment besides the Wi-Fi thermostat must be powered by natural gas.</td></tr>
<tr><td>Marketing Approach</td><td>The RP program will be a cornerstone of the two-pronged marketing approach for the portfolio. The program is expected to be a large portion of the general call-to-action on the residential side as well as a key part of trade ally outreach efforts. This will include placement on UGI’s energy efficiency website, www.ugi.com/savesmart, as well as a general social media push. This program will also include more tailored messages for developers, owners, and managers of larger multi-family properties to make sure that high efficiency options are considered when bulk-purchasing decisions may be made. The RP program will also be regularly featured in UGI Gas monthly bill inserts.</td></tr>
</table>

Evaluation, Measurement, and Verification	Quality Assurance All applications will require proof of purchase and a valid UGI Gas account number. Rebates received as an instant rebate via a qualified participating contractor or equipment distributor will be accompanied by an invoice showing the point of sale discount passed on to the customer. The rebate processor will verify that the equipment is eligible for the rebate based on the model number before issuing any rebate. The program's rebate processor will maintain a real-time database of rebate activity, which will be periodically reviewed by UGI Gas and stored separately for long-term purposes. A third-party inspector will perform on-site inspections on approximately five percent (5%) of non-thermostat equipment rebates and approximately three percent (3%) of Wi-Fi thermostat rebates in order to obtain a statistically significant sample of activity. The inspection will consist of verifying that the rebated equipment is installed and operational and conclude with a short informational interview with the participant. Evaluations A third-party vendor began evaluation activity on the existing UGI South and North programs at the end of FY 2018. This vendor will continue to provide evaluation activity in conjunction with all applicable UGI Gas EE&C programs. The program evaluation activity is expected to continue on a biennial basis, with the next evaluation scheduled for FY 2021.

Program Administration	Rebate Processing The rebate processor will accept customer applications, track and verify application information, notify the customer of any issues, maintain a call center, and report results to UGI Gas. The rebate processor may also be responsible for other rebate programs in order to streamline portfolio management. UGI Gas plans to continue to utilize the existing rebate processor to help ensure a seamless transition and process for customers. Marketing and Outreach The UGI Gas marketing vendor and the UGI Gas internal team will handle marketing and outreach for the RP program. Inspector A separate contractor from the one installing any equipment will perform on-site inspections and collect customer feedback and is expected to be the same as that utilized by UGI Gas in order to standardize inspection workflows and data collection. Evaluator A third-party evaluator will be retained to perform regular evaluations approximately every two years.
Special Notes	In addition to offering cash rebates and instant rebates via a qualified participating contractor, customers will also have the option to purchase qualified smart thermostats via an online marketplace

	operated by the UGI Gas rebate processor. This website offers the most popular qualified smart thermostats, with the rebate being discounted from the purchase price instantly during checkout.

2.2 Residential New Construction

Objective

The Residential New Construction (RNC) Program is designed to overcome market barriers to energy efficient space and water heating equipment, as well as high efficiency thermal envelopes, in the residential new construction sector through rebates offered to builders and developers, and general potential buyer awareness. The objective of the program is to avoid lost opportunities by encouraging builders and developers to install the most efficient gas heating technologies available instead of less efficient baseline equipment, as well as promote thermal envelope best practices. The program also aims to strengthen UGI Gas's relationship with builders, HVAC contractors, suppliers, and other trade allies.

Eligible Rate Class

R/RT

Cost Effectiveness

Five-Year Cost-Effectiveness Results (2018$)

CE Test	PV Benefits	PV Costs	PV Net	BCR
TRC	$ 18,038,897	$ 8,754,545	$ 9,284,352	2.06
PAC	$ 11,750,847	$ 5,695,076	$ 6,055,770	2.06

Savings Projections

Five-Year Savings Projections

	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY '20-'24
Natural Gas (MMBtus)						
First Year	20,623	9,377	39,185	39,185	39,185	**147,555**
Lifetime	412,451	187,534	783,703	783,703	783,703	**2,951,094**
Electric Energy (kWh)						
First Year	1,426,485	376,258	1,573,656	1,573,656	1,573,656	**6,523,710**

Lifetime	28,529,691	7,525,152	31,473,120	31,473,120	31,473,120	**130,474,203**
Peak (kW)	616.2	110.0	459.7	459.7	459.7	**2,105.3**
Water (Gallons)						
First Year	-	-	-	-	-	**-**
Lifetime	-	-	-	-	-	**-**

Budget Projections

Five-Year Budgets (Nominal)

Category	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY '20-'24
Customer Incentives	$573,800	$358,200	$1,356,700	$1,356,700	$1,356,700	**$5,002,100**
Administration	153,000	155,000	631,000	631,000	631,000	**2,201,000**
Marketing	55,000	55,000	50,000	50,000	50,000	**260,000**
Inspections	16,000	16,000	46,000	46,000	46,000	**170,000**
Evaluation	40,000	-	-	60,000	-	**100,000**
Total	**$837,800**	**$584,200**	**$2,083,700**	**$2,143,700**	**$2,083,700**	**$7,733,100**

Participation Projections

Five-Year Participation Projections

Project Type	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY '20-'24
HERS Track New Home	328	333	1,117	1,117	1,117	**4,012**
ENERGY STAR New Home	142	144	479	479	479	**1,723**
Total	**470**	**477**	**1,596**	**1,596**	**1,596**	**5,735**

Program Design

Addressing efficiency when a building is first built is the cheapest and longest lasting way to change energy consumption patterns. The RNC program offers incentives to builders and/or developers for going beyond building code to reduce natural gas consumption. UGI Gas will continue to use the current program administrator to review customer applications, assess the project plans, verify that each project meets program eligibility requirements, help the customer to achieve the highest feasible and cost-effective savings, and issue rebate payments.

	Similar to the program design of the Act 129 129 EDCs, the program focuses on a whole home energy efficient building practice that is evaluated by savings above code, as established through a Home Energy Rating System score ("HERS rating" or "HERS score"). The HERS rating will evaluate the savings above a baseline code construction home and will issue incentives based on the natural gas savings achieved. The RNC program encourages participants to go as deep as possible by addressing the space heating system, water heating system, and building envelope.
Target Market and End Uses	The RNC program targets all new residential construction projects (including "gut rehab") contemplating use of natural gas to provide space and hot water heating. For the purposes of this program, gut rehabilitation is defined as a project where the interior space of the building exposes the studs or two or more of the mechanical systems are being replaced and are required to meet current energy code standards. In general, the program aims to incentivize only the highest levels of efficient equipment and construction practices on the market. The RNC program takes a whole-building approach, acquiring savings from multiple measures compared to a baseline building just meeting code. For single family and small multi-family buildings, measures might include thermal envelope insulation, heating equipment, and water heating equipment and fixtures.
Financial Incentives	Residential customers will receive a lump sum incentive for achieving the program required level of savings over code and/or a designated HERS rating score that will be designed to represent an

<table>
<tr><td></td><td>average saving over code. An additional incentive category will be created to more deeply incentivize homes that achieve ENERGY STARY certification in addition to the required level of savings over code and/or designated HERS score. The maximum incentive that UGI Gas will offer is $55/MMBtu. The following table provides an overview of proposed savings levels and associated incentives.
<table>
<tr><th>Fiscal Year</th><th>Code Baseline</th><th>Savings Over Code</th><th>Base Incentive ($/MMBtu)</th><th>Incentive ENERGY STAR® ($/MMBtu)</th></tr>
<tr><td>FY 2020</td><td>2009 IECC</td><td>30%</td><td>$25.00</td><td>$30.00</td></tr>
<tr><td>FY 2021</td><td>2015 IECC</td><td>10%</td><td>$35.00</td><td>$40.00</td></tr>
<tr><td>FY 2022-2024</td><td>2015 IECC</td><td>15%</td><td>$40.00</td><td>$45.00</td></tr>
</table></td></tr>
<tr><td>Marketing Approach</td><td>The RNC program will focus on tailored messages for developers, and builders (including ENERGY STAR® builders) to ensure that high efficiency options are considered when engaging in major rehab projects as well as in new construction. UGI Gas will also explore ways in which to highlight the efficiency of homes to potential buyers, including through social media and signage placed at model homes.</td></tr>
<tr><td>Evaluation, Measurement, and Verification</td><td><u>Quality Assurance</u>

All applications will require information confirming installation and proof of UGI Gas service for heating. Inspections will be performed on 5% of residential new construction projects. Inspections must verify that the measures proposed for the building were installed as planned and that savings targets have been met and must conclude with a short informational interview with the owner and/or</td></tr>
</table>

	developer. The program's rebate processor will maintain a real-time database of rebate activity, which will be periodically reviewed by UGI Gas and stored separately for long-term purposes. Evaluations The program evaluation activity will be expected to continue seamlessly with the current evaluation of the UGI North and South programs. This vendor will continue to provide evaluation activity in conjunction with all applicable UGI Gas EE&C programs.
Program Administration	Technical Assistance and Rebate Processing UGI Gas will continue to use the current program administrator to review customer applications, assess the project plans, verify that each project meets program eligibility requirements, help the customer to achieve the highest feasible and cost-effective savings, and issue rebate payments. Marketing and Outreach The UGI Gas marketing vendor and the UGI Gas internal team will handle marketing and outreach for the RNC program. Inspector A separate contractor will perform on-site inspections and collect customer feedback. The same firm responsible for providing technical assistance may perform this role. Evaluator

	A third-party evaluator will be retained to perform regular evaluations approximately every two years.
Special Notes	UGI Gas will follow the guidance from the Act 129 SWE regarding the baseline code level from which the program counts savings. Currently, UGI Gas anticipates that the code baseline for savings purposes will be IECC 2009 until Phase IV of Act 129. The new construction market is highly cyclical and participation levels in the program will be highly influenced by broader economic trends beyond the control of UGI Gas.

2.3 Residential Retrofit

Objective

The Residential Retrofit (RR) Program is designed to overcome market barriers to energy efficiency in the existing residential sector through rebates offered either to customers undergoing a retrofit project or to their installation contractor(s). The program encourages improvements to the thermal envelope of the structure, particularly reductions in building air leakage and increases in insulation levels, as well as installation of the most efficient gas heating technologies. The program also aims to strengthen UGI Gas's relationship with Home Performance contractors, suppliers, and other trade allies.

Eligible Rate Class

R/RT

Cost Effectiveness

Five-Year Cost-Effectiveness Results (2018$)

CE Test	PV Benefits	PV Costs	PV Net	BCR
TRC	$ 6,153,839	$ 5,617,549	$ 536,290	1.10
PAC	$ 5,737,125	$ 5,293,854	$ 443,271	1.08

Savings Projections

Five-Year Savings Projections

	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY '20-'24
Natural Gas (MMBtus)						
First Year	17,325	24,340	5,423	5,423	5,423	**57,933**
Lifetime	296,969	415,413	92,113	92,113	92,113	**988,721**
Electric Energy (kWh)						
First Year	55,115	77,955	17,494	17,494	17,494	**185,551**
Lifetime	734,895	1,036,163	231,736	231,736	231,736	**2,466,266**
Peak (kW)	12.9	18.0	4.0	4.0	4.0	**42.8**
Water (Gallons)						

	First Year	1,588,215	2,255,265	508,229	508,229	508,229	**5,368,165**
	Lifetime	15,908,479	22,590,040	5,090,713	5,090,713	5,090,713	**53,770,657**

Budget Projections

Five-Year Budgets (Nominal)

Category	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY '20-'24
Customer Incentives	$468,000	$650,000	$143,000	$143,000	$143,000	**$1,547,000**
Administration	933,000	1,273,000	380,000	380,000	380,000	**3,346,000**
Marketing	80,000	89,000	67,000	67,000	67,000	**370,000**
Inspections	40,000	56,000	14,000	14,000	14,000	**138,000**
Evaluation	-	-	60,000	-	-	**60,000**
Total	**$1,521,000**	**$2,068,000**	**$664,000**	**$604,000**	**$604,000**	**$5,461,000**

Participation Projections

Five-Year Participation Projections

Project Type	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY '20-'24
Customer Receiving Assessments	2,000	2,840	640	640	640	**6,760**
Assessments Converted to Full Projects	360	500	110	110	110	**1,190**

Note: Full projects are also included in the count of customers receiving assessments

Program Design

The RR program offers incentives to customers retrofitting or weatherizing their homes by installing qualifying residential-sized space and water heating equipment, smart thermostats, and making thermal envelope improvements through use of approved contractors who may also receive an incentive to encourage comprehensiveness.

Customers must have an in-home assessment performed, which will cost up to $100. The assessment includes the direct installation of energy saving measures as well as a visual inspection

	of the thermal envelope and the space and water heating equipment in the home. Direct install measures can include, but not be limited to, energy saving measures such as ENERGY STAR smart thermostats, low flow devices, and water heater tank temperature set back. After the assessment, the customer receives a list of recommended efficiency measures, in addition to those that were directly installed. The customer can then have a contractor perform the recommended measures, after which they receive an incentive. Audits and thermal envelope improvements must be made by a contractor previously selected by the program as meeting program standards for high quality and technical performance. The rebate will be given to the customer upon submission of suitable documentation. Thermal envelope improvement rebates will require submittal of pre-post blower door measurements to document leakage rate reductions, and pre-post R-values, along with affected square footage, to document insulation improvements. Program participation levels will dictate allocation of funds from year to year, as well as the incentive levels offered. Initially, both participating customers and contractors each will be given an incentive that has been calculated based on first-year MMBtu projected savings. UGI Gas will aim to provide as little interruption as possible to the general community due to any program adjustments made to accommodate market conditions.
Target Market and End Uses	The RR program targets all residential homes that can benefit from improved space and water heating efficiency by encouraging a whole house approach to consider the full implications of specific

	measures to the overall performance of the house. The program offers a low-cost direct install Home Energy Assessment, with the goal of convincing home owners to go for a more comprehensive project. For comprehensive projects, the program aims to incentivize only the highest levels of efficient equipment on the market and the overall reduction in gas usage, including the interactive effects of equipment efficiency and thermal envelope improvements. A Home Energy Assessment may include, but is not limited to, the following gas saving measures: • ENERGY STAR® Smart Thermostat • Kitchen and Bathroom Faucet Aerator • Low flow Showerhead • Water Heater Tank Temperature Turndown In addition, the assessment may include the installation of health and safety measures, such as a Carbon Monoxide Detector. A comprehensive project is a project that goes beyond a Home Energy Assessment to include air sealing, insulation, and installing equipment such as, ENERGY STAR® certified furnaces, high efficiency boilers, and combination boilers as part of the home retrofit package. To qualify for even the lowest incentive tier, customers are guided toward the highest efficiency units as well as envelope improvements.

Financial Incentives	Customers will pay up to $100 for a home energy assessment, and contractors will be compensated up to $200 plus the cost of installed measures for a home energy assessment. The customer fee may be waived for qualifying low-income customers that are not eligible for LIURP services due to usage levels, or as a marketing promotion to assist with program ramp-up. Incentives for comprehensive jobs are designed to be in line with other offerings in the region and/or other companion programs in the UGI Gas portfolio such as the RP program. UGI Gas anticipates an incentive of approximately $55 per first year MMBtu savings for eligible projects. This incentive is designed to offset most of the incremental cost of the higher efficiency equipment and to provide a significant contribution to the cost of qualifying thermal envelope improvements.
Marketing Approach	Customers will be made aware of the RR program through the general media and bill inserts, as well as through equipment distributors, Home Performance contractors, and others in a position to affect equipment installation and thermal envelope improvement choices. The contractor network will play a large role in generating program leads. Approved program contractors will be encouraged to do their own marketing to enlist high quality leads for promoting high lead conversion rates, and to up-serve comprehensive retrofit packages qualifying for the highest incentive tier(s). They will be supported in these efforts through training and the development of co-branding materials that the contractor can use to promote the program.
Evaluation, Measurement, and Verification	<u>Quality Assurance</u>

	A contractor approved by UGI Gas will supervise all assessments and installation work. All approved contractors must employ a BPI certified employee to conduct both the in-home energy assessment and as crew leader for the installation of weatherization measures. Approved contractors must employ site technicians and site supervisors with BPI professional certifications appropriate to their duties. The approved contractor must also be trained in program protocols, and the contractor's first three projects will require confirmation of quality installation by an approved third party before moving from probationary status to becoming fully approved. Subsequent contractor work will be sampled up to 10% of projects submitted. Following approval into the program, an approved contractor will be required to meet a variety of criteria to remain in good standing with the program. These criteria will include, but not be limited to, customer satisfaction, quality assurance results, program activity, and ongoing training. <u>Rebate Processing</u> UGI Gas will continue to use the current program administrator to review customer applications, assess the project plans, verify that each project meets program eligibility requirements, help the customer to achieve the highest feasible and cost-effective savings, and issue rebate payments. <u>Evaluations</u> A third-party vendor will continue to provide evaluation activity in conjunction with all applicable UGI Gas EE&C programs. The next evaluation for the program is scheduled in FY 2022.

Program Administration	Contractor Network UGI Gas will put in place an approved contractor network that will perform energy audits, natural gas retrofit projects, and submit project and incentive application information to the program manager. Program Manager As part of the scope of work for the program administrator duties, UGI Gas will engage a program manager to oversee the contractor network, accept program applications, track and verify application information, communicate with customers if necessary, and report results to UGI Gas. Marketing and Outreach The UGI Gas marketing vendor and the UGI Gas internal team will handle marketing and outreach for the RR program. Inspector A separate contractor will perform on-site inspections and collect customer feedback. The inspector may also spend a portion of their time directed towards onsite mentoring for contractors. The program manager may perform the inspection role. Evaluator A third-party evaluator will be retained to perform an evaluation once a year's worth of post-installation data is available for the first year of the updated program design activity, in FY 2022.

Special Notes	UGI Gas will explore ways in which to encourage contractors to go after deeper savings. This may include setting aside a portion of incentives to go directly towards contractors in the form of a performance bonus.

2.4 Nonresidential Prescriptive

Objective

The Nonresidential Prescriptive (NP) Program is designed to overcome market barriers to energy efficient equipment in the small business and commercial sector through rebates and customer outreach. The objective of the program is to encourage business owners to install the most efficient gas heating and process technologies available to replace older, less efficient equipment. The program also aims to strengthen UGI Gas's relationship with HVAC contractors, suppliers, and other trade allies.

Eligible Rate Class

N/NT, DS, LFD

Cost Effectiveness

Five-Year Cost-Effectiveness Results (2018$)

CE Test	PV Benefits	PV Costs	PV Net	BCR
TRC	$ 30,824,692	$ 8,147,406	$ 22,677,285	3.78
PAC	$ 29,572,845	$ 3,827,949	$ 25,744,895	7.73

Savings Projections

Five-Year Savings Projections

	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY '20-'24
Natural Gas (MMBtus)						
First Year	48,350	54,847	57,209	57,209	57,209	**274,825**
Lifetime	1,047,823	1,185,671	1,237,197	1,237,197	1,237,197	**5,945,086**
Electric Energy (kWh)						
First Year	49,305	53,075	54,546	54,546	54,546	**266,017**
Lifetime	644,116	685,945	700,654	700,654	700,654	**3,432,022**
Peak (kW)	6.3	6.8	7.0	7.0	7.0	**34.0**
Water (Gallons)						
First Year	3,026,890	3,297,976	3,413,079	3,413,079	3,413,079	**16,564,102**
Lifetime	45,047,023	48,902,518	50,523,665	50,523,665	50,523,665	**245,520,535**

Budget Projections

Five-Year Budgets (Nominal)

Category	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY '20-'24
Customer Incentives	$708,350	$817,450	$853,700	$853,700	$853,700	**$4,086,900**
Administration	76,000	77,000	77,000	77,000	77,000	**384,000**
Marketing	54,000	54,000	54,000	54,000	54,000	**270,000**
Inspections	10,000	10,000	11,000	11,000	11,000	**53,000**
Evaluation	-	50,000	-	60,000	-	**110,000**
Total	**$848,350**	**$1,008,450**	**$995,700**	**$1,055,700**	**$995,700**	**$4,903,900**

Participation Projections

Five-Year Participation Projections

Measure Name	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY '20 - FY '24
Commercial Space Heating						
Commercial Boiler (ENERGY STAR)	143	159	166	166	166	**800**
Unit Heater (Warm Air)	162	181	189	189	189	**910**
Unit Heater (Infrared)	54	61	63	63	63	**304**
Steam Trap (<15 PSIG)	117	132	137	137	137	**660**
Commercial Water Heating						
Commercial Water Heater (Storage)	45	50	53	53	53	**254**
Commercial Water Heater (Tankless)	45	50	53	53	53	**254**
Commercial Kitchen						
Fryers (ENERGY STAR - Small Vat)	57	65	68	68	68	**326**
Fryers (ENERGY STAR - Large Vat)	6	7	7	7	7	**34**
Griddle (ENERGY STAR - 6 SF)	20	23	24	24	24	**115**
Griddle (ENERGY STAR - 8 SF)	8	8	8	8	8	**40**
Griddle (ENERGY STAR - 10SF)	4	5	5	5	5	**24**
Dishwasher (Low Temp - Under Counter)	18	20	21	21	21	**101**
Dishwasher (Low Temp - Stationary Single Tank Door)	21	23	24	24	24	**116**
Dishwasher (Low Temp - Single Tank Conveyor)	3	3	3	3	3	**15**
Dishwasher (High Temp - Under Counter)	21	23	24	24	24	**116**
Dishwasher (High Temp - Stationary Single Tank Door)	8	9	9	9	9	**44**
Dishwasher (High Temp - Single Tank Conveyor)	4	4	4	4	4	**20**
Total	**736**	**823**	**858**	**858**	**858**	**4,133**

Program Design	The NP offers rebates for qualifying equipment for three different applications; commercial-sized space heating, commercial-sized water heating, and commercial kitchens. Customers will be made aware of opportunities through traditional marketing efforts, such as bill inserts and media advertisements, installation contractors, and supply houses. Customers will have a contractor install the measure and receive a cash rebate to offset most of the incremental cost of the higher efficiency equipment. To relieve busy business owners of the paperwork, UGI Gas will also explore batching rebates and paying them directly to contractors and/or supply houses, with the rebate amount clearly indicated on the participant's invoice. The NP program offers rebates for qualifying commercial-sized space heating, water heating, commercial kitchen, and custom applications. Customers will be made aware of opportunities through traditional marketing efforts, such as bill inserts and media advertisements, contractors, and supply houses. Customers will have a contractor install the measure and receive a cash rebate to offset most of the incremental cost of the higher efficiency equipment. UGI Gas will continue to examine other equipment for potential inclusion in the program, as well as the relative market adoption of equipment already receiving incentives. If program funds begin to run low in a given year, incentive levels may be lowered, or equipment may be removed from the program if additional budget adjustments cannot be made. UGI Gas will aim to provide as little interruption to customers as possible due to such adjustments.

Target Market and End Uses	The NP program will serve the small business and commercial market such as office buildings, restaurants, and agricultural facilities, and will target three main end-uses. The first and largest end-use targeted is space heating, through commercial boilers, unit heaters, infrared heaters, and steam traps. The second target end-use is commercial water heaters. The last end-use is for addressing both cooking and hot water heating through a variety of commercial kitchen equipment.
Financial Incentives	Incentives were designed to be generally in-line with the UGI North and South programs of the same name. Incentives are designed to offset approximately two-thirds of the incremental cost to install the efficient equipment. The table below lists the proposed incentive schedule, with the addition of some new kitchen equipment and the removal of medium- and high-pressure steam traps (which will be addressed through the Nonresidential Custom program). ***Proposed Nonresidential Prescriptive Program Rebates (Nominal)*** **Equipment** / **Minimum Efficiency** / **Proposed Incentive** Commercial Boiler (>= 300MBh) / ENERGY STAR / $2 / MBh + $2,000 Unit Heater (Warm Air/Low Intensity Infrared) / 90+ Et/AFUE / $2 / MBh Steam Trap / <15 PSIG / $50 Commercial Water Heater / ENERGY STAR® / $4 / MBh Commercial Fryer / ENERGY STAR® / $500 Commercial Fryer (Large) / ENERGY STAR® / $750 Commercial Griddle / ENERGY STAR® / $600 Dishwasher (Low Temp – Undercounter) / ENERGY STAR® / $100 Dishwasher (Low Temp – Door) / ENERGY STAR® / $800 Dishwasher (Low Temp – Conveyor) / ENERGY STAR® / $1,000 Dishwasher (High Temp – Undercounter) / ENERGY STAR® / $700 Dishwasher (High Temp – Door) / ENERGY STAR® / $400 Dishwasher (High Temp – Conveyor) / ENERGY STAR® / $1,100 All equipment must be powered by natural gas, except for commercial dishwashers.

Marketing Approach	The NP marketing approach focuses on targeted outreach to trade allies and supply houses. Outreach efforts will attempt to reach the decision maker at the time of, and in advance of, the need for equipment replacement. UGI Gas will provide regular outreach and training sessions on efficiency opportunities with HVAC contractors, heating suppliers, kitchen equipment suppliers, local business organizations, and other parties that deal with commercial equipment to provide education on opportunities for engagement with the program, hand out rebate applications, and encourage the stocking of high efficiency equipment. Good penetration rates will rely heavily on an educated contractor network to understand how to up-serve participants with more efficient products when a service call is requested, or new equipment is needed. Contractor training will be provided to those already part of the existing contractor network and qualified for commercial work. UGI Gas will promote the program through its energy efficiency website, www.ugi.com/savesmart, and other marketing activities.
Evaluation, Measurement, and Verification	<u>Quality Assurance</u> All applications will require proof of purchase and a valid UGI Gas account number. All rebates will require proof of equipment installation, including information about the installing contractor. The rebate processor will verify that the equipment is eligible for the rebate based on the model number before issuing any rebate. The program's rebate processor will maintain a real-time database of rebate activity, which will be periodically reviewed by UGI Gas and stored separately for long-term purposes.

	A third-party inspector will perform on-site inspections on approximately five percent (5%) of all prescriptive rebates in order to get a statistically significant sample of ongoing activity. The inspection will consist of verifying that the rebated equipment is installed and operational and conclude with a short informational interview with the participant. Evaluations The program evaluation activity will be expected to continue seamlessly with the current evaluation of the UGI South program. A third-party vendor began evaluation activity on the existing UGI South program in September of 2018. This vendor will continue to provide evaluation activity in conjunction with all applicable UGI Gas EE&C programs.
Program Administration	Rebate Processing The rebate processor will accept customer applications, track and verify application information, notify the customer of any issues, maintain a call center, and report results to UGI Gas. The rebate processor may also be responsible for other rebate programs in order to streamline portfolio management. UGI Gas plans to continue to utilize the existing rebate processor to help ensure a seamless transition and process for customers. Marketing and Outreach The UGI Gas marketing vendor and the UGI Gas internal team will handle marketing and outreach for the NP program.

	<u>Inspector</u> A separate contractor from the one installing any equipment will perform on-site inspections and collect customer feedback and is expected to be the same as that utilized by UGI Gas to standardize inspection workflows and data collection. <u>Evaluator</u> A third-party evaluator will be retained to perform evaluations approximately every two years.
Special Notes	Due to the complex nature of the nonresidential equipment market, the exact mix of measures and adoption of different technologies is not easily predicted. While UGI Gas is confident that the projected budget levels are appropriate, the exact mix of measures may vary.

2.5 Nonresidential Custom

Objective

The Nonresidential Custom (NC) Program will provide incentives for overcoming market barriers for natural gas efficiency in commercial, industrial, and multifamily buildings. This can be through the natural replacement of equipment not covered in the NP Program, the retrofits of existing buildings, or by incenting natural gas energy savings in new construction or gut renovations.

Eligible Rate Class

N/NT, DS, LFD

Cost Effectiveness

Five-Year Cost-Effectiveness Results (2018$)

CE Test	PV Benefits	PV Costs	PV Net	BCR
TRC	$ 16,816,997	$ 12,415,806	$ 4,401,191	1.35
PAC	$ 16,559,226	$ 5,115,917	$ 11,443,309	3.24

Savings Projections

Five-Year Savings Projections

	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY '20-'24
Natural Gas (MMBtus)						
First Year	10,890	21,431	32,866	43,406	43,406	**152,000**
Lifetime	217,806	428,612	657,320	868,126	868,126	**3,039,990**
Electric Energy (kWh)						
First Year	11,361	22,372	34,514	45,525	45,525	**159,299**
Lifetime	227,224	447,449	690,285	910,509	910,509	**3,185,977**
Peak (kW)	11.6	23.2	40.4	52.0	52.0	**179.1**
Water (Gallons)						
First Year	-	-	-	-	-	**-**
Lifetime	-	-	-	-	-	**-**

Budget Projections

Five-Year Budgets (Nominal)

Category	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY '20-'24
Customer Incentives	$346,000	$680,800	$1,043,000	$1,377,800	$1,377,800	**$4,825,400**
Administration	214,000	276,000	344,000	406,000	406,000	**1,646,000**
Marketing	33,000	41,000	49,000	57,000	57,000	**237,000**
Inspections	8,000	16,000	24,000	32,000	32,000	**112,000**
Evaluation	-	50,000	-	60,000	-	**110,000**
Total	**$601,000**	**$1,063,800**	**$1,460,000**	**$1,932,800**	**$1,872,800**	**$6,930,400**

Participation Projections

Five-Year Participation Projections

Project Type	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY '20-'24
C&I Retrofit	30	59	90	119	119	**417**
C&I New Construction	2	4	7	9	9	**31**
Total	**32**	**63**	**97**	**128**	**128**	**448**

Program Design

The NC program combines the existing Nonresidential Retrofit (NR) and Nonresidential New Construction (NNC) programs offered by the Company under its current EE&C Plans, as well as the custom measure track from the existing NP Program. The NC program offers incentives to commercial buildings and multi-family projects that wish to upgrade some portion of an existing building's performance or build a new building that includes cost-effective efficiency upgrades over a baseline code building practice. A technical assistance provider will evaluate projects for both savings opportunities and cost effectiveness. A custom package of measures will be determined that is cost-effective and an incentive offer will be extended to the customer based on the project's financial characteristics. The customer then has a set amount of time to perform the upgrades and receive a test-out audit after which the incentive will be paid.

Target Market and End Uses	The NC program primarily targets commercial buildings and multi-family housing projects but is also open to agriculture and industrial applications. Any cost-effective measure that saves natural gas is eligible, with space heating, water heating, and process heating expected to be the largest opportunities. The NC program is also expected to cover technology with more site-specific applications, such as heat-recovery systems, controls, range-hood ventilation make-up air systems, and other. The NC program will be a source for potential technologies to include as prescriptive rebates.
Financial Incentives	Incentives for NC projects will all be based on the financial characteristics of the project. UGI Gas will negotiate with the customer to find an incentive that makes the project attractive enough for the customer to pursue without paying too much of the incremental cost. The first approach for calculating an incentive will be to determine an acceptable internal rate of return ("IRR") for the project that the customer will accept. A secondary approach will be to buy down the project's simple payback to between 5 and 10 years. The incentive for a single project will be capped at the lesser of the project's gas benefits, incremental cost, or $100,000.
Marketing Approach	Customers will be made aware of the NC program through the general media and bill inserts, as well as through equipment distributors, HVAC and plumbing contractors, housing program administrators, and others in a position to affect equipment installation and thermal envelope improvement choices.
Evaluation, Measurement, and Verification	Quality Assurance

	The administrator will monitor all projects from the outset. This includes monitoring the installation specifications and practices as well as the final project inspection to verify that all program requirements have been met for issuance of the requested incentive. Evaluations The program is projected to have a full evaluation in FY 2021 and in FY 2023. Since the number of projects anticipated to be completed under the program is small, evaluations will be more focused on a "case study" approach that verifies performance once a project is complete and sufficient post data is collected.
Program Administration	Administrator Due to the limited number of projects anticipated in the NC program, UGI Gas will manage the program internally. Technical review of projects, as well as assisting potential customers with including efficiency in their program design will be administered by UGI Gas EE&C Staff. A separate program tracking system that includes efficiency modeling and calculations will be utilized by the UGI Gas EE&C Staff. Evaluator A third-party evaluator will be retained to perform an evaluation approximately every two years.

2.6 Combined Heat and Power

Objective

The Combined Heat and Power (CHP) Program seeks to promote the installation of cost-effective and net-primary-energy-saving CHP projects and provide meaningful CO_2 emission reductions. A CHP plant produces electricity at a commercial or industrial site while at the same time using the waste heat from the production of the electricity to serve a thermal load. Net efficiencies come from the recovered heat that is typically wasted in grid electricity production and avoided transmission and distribution losses from delivering the electricity from the generator to the customer site.

Eligible Rate Class

DS, LFD

Cost Effectiveness

Five-Year Cost-Effectiveness Results (2016$)

CE Test	PV Benefits	PV Costs	PV Net	BCR
TRC	$113,713,664	$91,998,234	$21,715,430	1.24

Savings Projections

Five-Year Savings Projections

	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY '20-'24
Net Primary Energy Savings (MMBtus)						
First Year	339,710	339,710	339,710	339,710	396,905	**1,755,747**
Lifetime	5,095,656	5,095,656	5,095,656	5,095,656	5,953,578	**26,336,203**
Net Customer Gas Usage Increase (MMBtus)						
First Year	236,517	236,517	236,517	236,517	276,428	**1,222,495**
Lifetime	3,547,752	3,547,752	3,547,752	3,547,752	4,146,424	**18,337,432**

Budget Projections

Five-Year Budgets (Nominal)

Category	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY '20-'24
Customer Incentives	$500,000	$500,000	$500,000	$500,000	$750,000	**$2,750,000**
Administration	60,000	60,000	60,000	60,000	60,000	**300,000**
Marketing	40,000	40,000	40,000	40,000	40,000	**200,000**
Inspections	5,000	5,000	5,000	5,000	7,500	**27,500**
Evaluation	30,000	30,000	30,000	30,000	45,000	**165,000**
Total	**$635,000**	**$635,000**	**$635,000**	**$635,000**	**$902,500**	**$3,442,500**

Participation Projections

Five-Year Participation Projections

Project Type	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY '20-'24
1121 kW CHP	0	0	0	0	1	**4**
3326 kW CHP	2	2	2	2	2	**7**
Total	**2**	**2**	**2**	**2**	**3**	**11**

Program Design

The CHP program is a rollout of the same program as that offered under the UGI North and South EE&C Plans. Customers that are considering CHP need to submit the project details including CHP installation costs, annual electricity production, and gas usage before and after the CHP project is completed. Based on the particular CHP project details, verified by UGI Gas or its contractor, UGI Gas will determine whether it is cost-effective from the TRC perspective and reduces net primary energy usage. If these criteria are met, then the CHP project is eligible for an incentive from UGI Gas.

Though the customer has primary responsibility for developing the CHP costs, savings, and technical details, UGI Gas may provide some technical assistance, as well as business development for new projects.

Target Market and End Uses	The CHP Program targets large commercial and industrial customers with high thermal and electric loads. This program is most likely applicable to customers with year-round thermal requirements and high hours of use. Customer types that are likely candidates include hospitals, campuses and multi-shift industrial. Based on current avoided electric and gas avoided costs, only larger CHP projects (over 1,000 kW) are typically cost effective from the TRC perspective. If avoided costs change or the costs for micro turbines decline, then some smaller projects may become cost effective. UGI Gas will continue to closely monitor the CHP market and identify opportunities for all ranges of CHP technology and sizes.
Financial Incentives	$750/kW with a maximum of $250,000 per CHP project and no more than 50% of the CHP project cost.
Marketing Approach	UGI Gas will leverage its Relationship Managers to identify specific customers that may be likely candidates for CHP.
Evaluation, Measurement, and Verification	Every CHP project will be inspected, and documentation reviewed to ensure that the expected technology is correctly installed and operational. A third-party evaluator will be chosen to assess the actual versus projected electric and gas, generation and usage, respectively. Since the number of projects anticipated to be completed under the program is small, evaluations will be more focused on a “case study” approach that verifies performance once a project is complete and sufficient post data is collected.

Program Administration	The CHP program may be implemented either solely by UGI Gas or with assistance from an implementation contractor.
Special Notes	The CHP Program's costs and savings will be reported separately from the other efficiency programs, due to this program's increase in gas usage, whereas the other efficiency programs decrease gas usage. While UGI Gas is asking for general flexibility in annual program costs for the entire EE&C Portfolio, this flexibility is particularly important for the CHP program. CHP projects are complex and require long-term planning. Moreover, incentives represent a large percentage of the program budget. Because of these factors, it is difficult to predict the outcome for a single year. UGI Gas will limit its total spending to the five-year projected total spending, and under-spending from one year may be carried over to the next year.

3 Appendices

3.1 Avoided Cost Tables

Gas Avoided Costs (2018$)

	Baseload $/MMBTU	Space heating $/MMBTU	Water heating $/MMBTU	DRIPE $/MMBTU	CO2 $/MMBTU
2019	4.62	10.28	6.04		
2020	4.63	10.21	6.03	0.87	
2021	4.74	10.25	6.12	0.98	
2022	4.83	10.29	6.19	1.05	1.46
2023	4.99	10.42	6.35	1.09	1.55
2024	5.16	10.55	6.50	1.07	1.65
2025	5.32	10.68	6.66	1.05	1.74
2026	5.39	10.71	6.72	0.94	1.84
2027	5.52	10.82	6.84	0.87	1.93
2028	5.53	10.80	6.84	0.77	2.03
2029	6.21	11.50	7.53	0.66	2.12
2030	6.22	11.47	7.53	0.55	2.22
2031	6.23	11.45	7.54	0.55	2.38
2032	6.23	11.41	7.53	0.55	2.55
2033	6.24	11.38	7.52	0.55	2.72
2034	6.23	11.33	7.51	0.55	2.89
2035	6.35	11.43	7.62	0.55	3.06
2036	6.38	11.42	7.64	0.55	3.22
2037	6.47	11.49	7.72	0.55	3.39
2038	6.54	11.53	7.78	0.55	3.56
2039	6.58	11.54	7.82	0.55	3.73
2040	6.63	11.56	7.86	0.55	3.89
2041	6.71	11.62	7.93	0.55	4.06
2042	6.77	11.65	7.99	0.55	4.23
2043	6.85	11.71	8.07	0.55	4.40
2044	6.93	11.76	8.14	0.55	4.57
2045	7.00	11.82	8.21	0.55	4.73
2046	7.08	11.87	8.28	0.55	4.73
2047	7.21	11.99	8.41	0.55	4.73
2048	7.32	12.07	8.51	0.55	4.73
2049	7.45	12.19	8.64	0.55	4.73
2050	7.55	12.27	8.73	0.55	4.73
2051	7.64	12.35	8.82	0.55	4.73
2052	7.74	12.43	8.91	0.55	4.73
2053	7.84	12.51	9.01	0.55	4.73
2054	7.95	12.60	9.11	0.55	4.73
2055	8.05	12.69	9.21	0.55	4.73
2056	8.16	12.78	9.31	0.55	4.73
2057	8.26	12.87	9.42	0.55	4.73

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Electric Avoided Costs – EE Programs (2018$)

Year	Energy $/kWh	Capacity $/kW-yr	T&D $/kW-yr	DRIPE $/kWh	CO2 $/kWh	Total Energy $/kWh
2019	$ 0.0494	$ 49.7354	$ 35.3291	$ -	$ -	$ 0.0494
2020	$ 0.0497	$ 49.7355	$ 35.3304	$ 0.0158	$ -	$ 0.0656
2021	$ 0.0503	$ 49.7399	$ 35.3304	$ 0.0216	$ -	$ 0.0718
2022	$ 0.0506	$ 49.7377	$ 35.3288	$ 0.0264	$ 0.0228	$ 0.0998
2023	$ 0.0508	$ 49.7392	$ 35.3255	$ 0.0301	$ 0.0243	$ 0.1052
2024	$ 0.0505	$ 49.7439	$ 35.3304	$ 0.0311	$ 0.0258	$ 0.1074
2025	$ 0.0579	$ 49.7413	$ 35.3330	$ 0.0372	$ 0.0273	$ 0.1224
2026	$ 0.0598	$ 49.7414	$ 35.3284	$ 0.0373	$ 0.0288	$ 0.1259
2027	$ 0.0651	$ 49.7435	$ 35.3262	$ 0.0355	$ 0.0302	$ 0.1309
2028	$ 0.0716	$ 49.7381	$ 35.3261	$ 0.0307	$ 0.0317	$ 0.1341
2029	$ 0.0751	$ 49.7434	$ 35.3277	$ 0.0242	$ 0.0332	$ 0.1326
2030	$ 0.0785	$ 49.7406	$ 35.3308	$ 0.0211	$ 0.0347	$ 0.1343
2031	$ 0.0794	$ 49.7387	$ 35.3305	$ 0.0174	$ 0.0373	$ 0.1341
2032	$ 0.0785	$ 49.7374	$ 35.3313	$ 0.0134	$ 0.0400	$ 0.1318
2033	$ 0.0767	$ 49.7362	$ 35.3286	$ 0.0094	$ 0.0426	$ 0.1287
2034	$ 0.0772	$ 49.7431	$ 35.3307	$ 0.0018	$ 0.0452	$ 0.1242
2035	$ 0.0776	$ 49.7412	$ 35.3289	$ 0.0018	$ 0.0479	$ 0.1272
2036	$ 0.0784	$ 49.7385	$ 35.3313	$ 0.0018	$ 0.0505	$ 0.1307
2037	$ 0.0793	$ 49.7427	$ 35.3295	$ 0.0018	$ 0.0531	$ 0.1342
2038	$ 0.0802	$ 49.7377	$ 35.3274	$ 0.0018	$ 0.0557	$ 0.1377
2039	$ 0.0816	$ 49.7388	$ 35.3286	$ 0.0018	$ 0.0584	$ 0.1418
2040	$ 0.0816	$ 49.7379	$ 35.3327	$ 0.0018	$ 0.0610	$ 0.1444
2041	$ 0.0816	$ 49.7421	$ 35.3283	$ 0.0018	$ 0.0636	$ 0.1470
2042	$ 0.0816	$ 49.7366	$ 35.3301	$ 0.0018	$ 0.0663	$ 0.1496
2043	$ 0.0816	$ 49.7425	$ 35.3304	$ 0.0018	$ 0.0689	$ 0.1523
2044	$ 0.0816	$ 49.7384	$ 35.3292	$ 0.0018	$ 0.0715	$ 0.1549
2045	$ 0.0816	$ 49.7379	$ 35.3296	$ 0.0018	$ 0.0741	$ 0.1575

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Electric Avoided Costs – CHP Program (2018$)

Year	Energy $/kWh	Capacity $/kW-yr	T&D $/kW-yr	DRIPE $/kWh	CO2 $/kWh	Total Energy $/kWh
2019	$ 0.0486	$ 48.9503	$ 34.7714	$ -	$ -	$ 0.0486
2020	$ 0.0489	$ 48.9504	$ 34.7727	$ 0.0156	$ -	$ 0.0645
2021	$ 0.0495	$ 48.9547	$ 34.7727	$ 0.0212	$ -	$ 0.0707
2022	$ 0.0498	$ 48.9526	$ 34.7711	$ 0.0260	$ 0.0225	$ 0.0982
2023	$ 0.0499	$ 48.9541	$ 34.7679	$ 0.0296	$ 0.0239	$ 0.1035
2024	$ 0.0497	$ 48.9586	$ 34.7727	$ 0.0306	$ 0.0254	$ 0.1057
2025	$ 0.0570	$ 48.9561	$ 34.7752	$ 0.0366	$ 0.0268	$ 0.1205
2026	$ 0.0589	$ 48.9562	$ 34.7707	$ 0.0367	$ 0.0283	$ 0.1239
2027	$ 0.0641	$ 48.9583	$ 34.7685	$ 0.0349	$ 0.0298	$ 0.1288
2028	$ 0.0705	$ 48.9529	$ 34.7684	$ 0.0302	$ 0.0312	$ 0.1319
2029	$ 0.0739	$ 48.9581	$ 34.7700	$ 0.0239	$ 0.0327	$ 0.1305
2030	$ 0.0772	$ 48.9554	$ 34.7730	$ 0.0208	$ 0.0342	$ 0.1322
2031	$ 0.0781	$ 48.9536	$ 34.7728	$ 0.0171	$ 0.0368	$ 0.1320
2032	$ 0.0772	$ 48.9522	$ 34.7736	$ 0.0132	$ 0.0393	$ 0.1298
2033	$ 0.0755	$ 48.9510	$ 34.7709	$ 0.0092	$ 0.0419	$ 0.1267
2034	$ 0.0760	$ 48.9579	$ 34.7730	$ 0.0018	$ 0.0445	$ 0.1222
2035	$ 0.0763	$ 48.9560	$ 34.7712	$ 0.0018	$ 0.0471	$ 0.1252
2036	$ 0.0772	$ 48.9534	$ 34.7736	$ 0.0018	$ 0.0497	$ 0.1286
2037	$ 0.0781	$ 48.9575	$ 34.7718	$ 0.0018	$ 0.0523	$ 0.1321
2038	$ 0.0789	$ 48.9526	$ 34.7697	$ 0.0018	$ 0.0549	$ 0.1355
2039	$ 0.0803	$ 48.9536	$ 34.7709	$ 0.0018	$ 0.0574	$ 0.1395
2040	$ 0.0803	$ 48.9527	$ 34.7749	$ 0.0018	$ 0.0600	$ 0.1421
2041	$ 0.0803	$ 48.9569	$ 34.7706	$ 0.0018	$ 0.0626	$ 0.1447
2042	$ 0.0803	$ 48.9514	$ 34.7724	$ 0.0018	$ 0.0652	$ 0.1473
2043	$ 0.0803	$ 48.9573	$ 34.7727	$ 0.0018	$ 0.0678	$ 0.1499
2044	$ 0.0803	$ 48.9532	$ 34.7715	$ 0.0018	$ 0.0704	$ 0.1525
2045	$ 0.0803	$ 48.9527	$ 34.7719	$ 0.0018	$ 0.0730	$ 0.1550

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3.2 Detailed Program and Portfolio Cost-effectiveness

Energy Efficiency Programs' Cost-effectiveness over Five-Year Portfolio (2018$)

	Total Resource					Gas Energy System				
	Present Value		PV of Net	Benefit-Cost	Levelized Cost	Present Value		PV of Net	Benefit-Cost	Levelized Cost
	Benefit [2]	Cost [3]	Benefits [4]	Ratio [5]	$/MMBTU	Benefit [10]	Cost [11]	Benefits [12]	Ratio [13]	$/MCF
Portfolio Total	$138,741,368	$75,246,271	$63,495,096	1.84	5.93	$130,360,139	$46,439,459	$83,920,680	2.81	3.66
Non-Measure Costs		$12,459,724					$12,459,724			
Total Measure Costs	$138,741,368	$62,786,547	$75,954,820	2.21	4.95	$130,360,139	$33,979,735	$96,380,404	3.84	2.68
Program										
Residential Prescriptive (RP)										
Program Total	$66,906,943	$36,799,435	$30,107,508	1.82	5.79	$66,740,097	$22,995,133	$43,744,963	2.90	3.62
Non-Measure Costs		$1,623,960					$1,623,960			
Total Measure Costs	$66,906,943	$35,175,475	$31,731,468	1.90	5.54	$66,740,097	$21,371,174	$45,368,923	3.12	3.36
Residential New Construction (RNC)										
Program Total	$18,038,897	$8,754,545	$9,284,352	2.06	5.99	$11,750,847	$5,695,076	$6,055,770	2.06	3.90
Non-Measure Costs		$2,007,904					$2,007,904			
Total Measure Costs	$18,038,897	$6,746,641	$11,292,256	2.67	4.61	$11,750,847	$3,687,172	$8,063,674	3.19	2.52
Residential Retrofit (RR)										
Program Total	$6,153,839	$5,617,549	$536,290	1.10	10.56	$5,737,125	$5,293,854	$443,271	1.08	9.95
Non-Measure Costs		$3,116,442					$3,116,442			
Total Measure Costs	$6,153,839	$2,501,107	$3,652,732	2.46	4.70	$5,737,125	$2,177,411	$3,559,714	2.63	4.09
Nonresidential Prescriptive (NP)										
Program Total	$30,824,692	$8,147,406	$22,677,285	3.78	2.86	$29,572,845	$3,827,949	$25,744,895	7.73	1.34
Non-Measure Costs		$624,609					$624,609			
Total Measure Costs	$30,824,692	$7,522,798	$23,301,894	4.10	2.64	$29,572,845	$3,203,340	$26,369,504	9.23	1.12
Nonresidential Custom (NC)										
Program Total	$16,816,997	$12,415,806	$4,401,191	1.35	8.30	$16,559,226	$5,115,917	$11,443,309	3.24	3.42
Non-Measure Costs		$1,575,279					$1,575,279			
Total Measure Costs	$16,816,997	$10,840,527	$5,976,470	1.55	7.25	$16,559,226	$3,540,638	$13,018,589	4.68	2.37
Portfoliowide Costs										
Program Total	-	$3,511,529	$(3,511,529)	-	-	-	$3,511,529	$(3,511,529)	-	-
Non-Measure Costs		$3,511,529					$3,511,529			
Total Measure Costs	-	-	-	-	-	-	-	-	-	-

Energy Efficiency Programs' Cost-effectiveness over Five-Year Portfolio (2018$), including DRIPE & CO_2

	Total Resource					Gas Energy System				
	Present Value		PV of Net	Benefit-Cost	Levelized Cost	Present Value		PV of Net	Benefit-Cost	Levelized Cost
	Benefit [2]	Cost [3]	Benefits [4]	Ratio [5]	$/MMBTU	Benefit [10]	Cost [11]	Benefits [12]	Ratio [13]	$/MCF
Portfolio Total	$177,382,125	$75,246,271	$102,135,853	2.36	5.93	$169,000,896	$46,439,459	$122,561,437	3.64	3.66
Non-Measure Costs		$12,459,724					$12,459,724			
Total Measure Costs	$177,382,125	$62,786,547	$114,595,577	2.83	4.95	$169,000,896	$33,979,735	$135,021,161	4.97	2.68
Program										
Residential Prescriptive (RP)										
Program Total	$86,025,637	$36,799,435	$49,226,202	2.34	5.79	$85,858,791	$22,995,133	$62,863,658	3.73	3.62
Non-Measure Costs		$1,623,960					$1,623,960			
Total Measure Costs	$86,025,637	$35,175,475	$50,850,162	2.45	5.54	$85,858,791	$21,371,174	$64,487,617	4.02	3.36
Residential New Construction (RNC)										
Program Total	$22,540,336	$8,754,545	$13,785,791	2.57	5.99	$16,252,285	$5,695,076	$10,557,209	2.85	3.90
Non-Measure Costs		$2,007,904					$2,007,904			
Total Measure Costs	$22,540,336	$6,746,641	$15,793,695	3.34	4.61	$16,252,285	$3,687,172	$12,565,113	4.41	2.52
Residential Retrofit (RR)										
Program Total	$7,658,120	$5,617,549	$2,040,571	1.36	10.56	$7,241,406	$5,293,854	$1,947,552	1.37	9.95
Non-Measure Costs		$3,116,442					$3,116,442			
Total Measure Costs	$7,658,120	$2,501,107	$5,157,013	3.06	4.70	$7,241,406	$2,177,411	$5,063,995	3.33	4.09
Nonresidential Prescriptive (NP)										
Program Total	$39,700,986	$8,147,406	$31,553,580	4.87	2.86	$38,449,139	$3,827,949	$34,621,190	10.04	1.34
Non-Measure Costs		$624,609					$624,609			
Total Measure Costs	$39,700,986	$7,522,798	$32,178,189	5.28	2.64	$38,449,139	$3,203,340	$35,245,799	12.00	1.12
Nonresidential Custom (NC)										
Program Total	$21,457,045	$12,415,806	$9,041,239	1.73	8.30	$21,199,275	$5,115,917	$16,083,357	4.14	3.42
Non-Measure Costs		$1,575,279					$1,575,279			
Total Measure Costs	$21,457,045	$10,840,527	$10,616,519	1.98	7.25	$21,199,275	$3,540,638	$17,658,637	5.99	2.37
Portfoliowide Costs										
Program Total	-	$3,511,529	$(3,511,529)	-	-	-	$3,511,529	$(3,511,529)	-	-
Non-Measure Costs		$3,511,529					$3,511,529			
Total Measure Costs	-	-	-	-	-	-	-	-	-	-

CHP Program Cost-effectiveness over Five-Year Portfolio (2018$)

PV 2018$	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	Total
TRC Benefits	$23,045,224	$22,498,360	$21,990,378	$21,519,254	$24,660,447	**$113,713,664**
TRC Costs	19,651,609	18,637,072	17,674,951	16,762,536	19,272,066	**91,998,234**
Utility Costs	635,000	635,000	635,000	635,000	902,500	**3,442,500**
TRC Net Benefits	**$3,393,615**	**$3,861,288**	**$4,315,427**	**$4,756,718**	**$5,388,382**	**$21,715,430**
TRC BCR	1.17	1.21	1.24	1.28	1.28	1.24

CHP Program Cost-effectiveness over Five-Year Portfolio (2018$), including DRIPE and CO_2

PV 2018$	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	Total
TRC Benefits	$42,036,884	$41,636,153	$41,074,702	$39,733,123	$44,803,852	**$209,284,714**
TRC Costs	19,651,609	18,637,072	17,674,951	16,762,536	19,272,066	**91,998,234**
Utility Costs	635,000	635,000	635,000	635,000	902,500	**3,442,500**
TRC Net Benefits	**$22,385,275**	**$22,999,081**	**$23,399,751**	**$22,970,587**	**$25,531,786**	**$117,286,481**
TRC BCR	2.14	2.23	2.32	2.37	2.32	2.27