

➤ **Summary of 60-Day Notice:** Home Performance with ENERGY STAR/Whole Home Efficiency

The following 60-Day Notice summarizes Public Service Company of Colorado's (the "Company") action to rename the Home Performance with ENERGY STAR product and to update the tech assumptions and deemed savings for the product.

The Company is including with this Notice:

- Redlined product write-up;
- Redlined Deemed Savings worksheets;
- Redlined Technical Assumptions worksheets; and
- Updated cost-benefit analyses.

A copy of this notice is available on our website at:

[https://www.xcelenergy.com/company/rates\\_and\\_regulations/filings/colorado\\_demand-side\\_management](https://www.xcelenergy.com/company/rates_and_regulations/filings/colorado_demand-side_management)

The Company is changing the product name to Whole Home Efficiency while adding measures for cold-climate heat pumps to align the product with Residential HVAC offerings. Additionally, the deemed sheets and technical assumptions were updated to accurately capture savings for clothes washer measures.

#### Whole Home Efficiency

The Company is changing the name of Home Performance with ENERGY STAR to Whole Home Efficiency. The administrators of Home Performance with ENERGY STAR are introducing mandatory programmatic changes which may increase the administrative costs associated with the product and potentially reduce participation. The Company has chosen to remove product association with Energy Star while maintaining current programmatic processes and requirements which has served customers well. The product will continue to promote a whole home approach to energy efficiency through bundling upgrades to achieve higher energy savings.

#### Cold Climate Heat Pumps

The Company is adding cold climate Air Source Heat Pumps (ASHP) and cold climate Minisplit Heat Pumps (MSHP) to align the product with measures offered within the Residential Heating & Cooling product.

#### Clothes washers

The Company is correcting the deemed savings and technical assumptions associated with ENERGY STAR clothes washers. The forecast assumptions included in the 2021-2022 DSM Plan referenced an outdated EnergyStar savings calculation. The savings formulas have been corrected to reflect current EnergyStar calculations, resulting in a reduction in the deemed savings for these measures.

**Table 1: Summary of Forecasted Impacts: Whole Home Efficiency**

	2021		2022	
	<i>As Filed</i>	<i>Revised per 60-day</i>	<i>As Filed</i>	<i>Revised per 60-day</i>
Electric Savings (kWh)	481,429	488,764	696,826	698,861
Electric Demand Reduction (kW)	202	153	291	210
Budget*	\$87,246	\$87,346	\$122,943	\$122,532
MTRC Test Ratio	1.05	0.93	1.16	1.03
Gas Savings (Dth)	6,973	7,277	9,098	9,522
Budget*	\$68,082	\$69,881	\$92,029	\$94,340
MTRC Test Ratio	0.64	0.65	0.66	0.68

\*Rebates only. While the anticipated expenditure impacts are forecasted, the Company acknowledges that this Notice does not change the filed budget.

## ➤ ~~Home Performance with ENERGY STAR~~ Whole Home Efficiency

### A. Description

~~The Home Performance with ENERGY STAR® (“HPwES”)~~ The Whole Home Efficiency product is targeted toward existing single-family homes in need of multiple energy efficiency improvements. By providing these customers with rebate incentives, the Company is able to incorporate a bundled, whole home approach to energy efficiency. ~~HPwES~~ Whole Home Efficiency is available to residential Xcel Energy account holders with combination electric and natural gas, electric only, or gas only service. Eligibility is dependent on the type of equipment installed.

~~Home Performance was developed using principles from the nationally recognized ENERGY STAR® “Home Performance with ENERGY STAR” product.~~<sup>1</sup> The concept of the product is to provide the customer with one-stop for all of their home efficiency needs. This comprehensive approach requires an energy audit as a prerequisite which is then used to generate a list of recommendations. The customer may choose to complete this prerequisite through the Home Energy Audit product or a Home Energy Squad Plus visit. The contractor, who may also be the auditor, reviews the recommended improvements and completes the work. Some projects may receive an independent verification of the improvements after completion if a Quality Control (“QC”) inspection is performed. The contractor and homeowner may also request advice on recommended upgrades and rebates from the Energy Advising service offered through the Home Energy Audit product. Since this product requires an audit and deeper engagement from the customer, AMI interval data would greatly enhance the conversation and allow auditors to give customers an even better analysis of the energy usage within their home.

Trade partner companies interested in performing certain types of equipment installations must have one technician in each certification area that they are participating in:

- Building Performance Institute (“BPI”)
  - Building Analyst
  - Envelope Professional
  - Residential Whole House Air Leakage Control Installer
  - Air Leakage Control Installer
  - Quality Control Inspector
  - Crew Leader
  - Energy Auditor
- North American Technician Excellence (“NATE”)
  - NATE certification in Air Conditioning or Air-to-air heat pump. Service or installation certification accepted.

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<sup>1</sup>Learn more about EPA’s Home Performance with ENERGY STAR®:  
[https://www.energystar.gov/index.cfm?fuseaction=hpwes\\_profiles.showSplash&s=footer](https://www.energystar.gov/index.cfm?fuseaction=hpwes_profiles.showSplash&s=footer)

A technician's certification may not be used by another trade partner company to meet the product requirements. Additionally, trade contractors must complete the appropriate ~~Home Performance~~ contractor trainings depending on the services they offer.

These trainings provide contractors with information on the product components, process, and diagnostic testing required as part of the efficient measure installations. All participating contractors must become a participating trade partner within ~~HPwES- Whole Home Efficiency~~ before providing installations for participants in the product. A random sample of 10% of the contractor's jobs will be inspected and verified. Once contractors have completed all necessary trainings and signed the agreement, they will be included on the approved contractor list, which is included in the customer packet and on the Company's website.<sup>2</sup>

## **B. Targets, Participants & Budgets**

### Targets and Participants

The product targets were developed based on the 2018 and 2019 product results and the Company's forecasted assumptions for increased participation as a result of the product redesign.

### Budgets

The budget for this product is based on the 2018 and 2019 expenditures and includes costs for third-party implementation, software, measurement and verification inspections, trade incentive rebates, and minimal product promotion.

## **C. Application Process**

Customers interested in participating in ~~HPwES- Whole Home Efficiency~~ must first complete a Home Energy Audit with blower door test or a Home Energy Squad Plus visit. The customer will be provided information on the ~~Home Performance- Whole Home Efficiency~~ product, tying the specific product requirements into the audit recommendations. The customer may then sign up for ~~Home Performance- Whole Home Efficiency~~ through their auditor at the time of the audit or any time thereafter using the online signup form. The customer will have two years from the ~~Home Performance- Whole Home Efficiency~~ enrollment date to complete the equipment installs and submit applications for rebates.

The ~~Home Performance- Whole Home Efficiency~~ product information, approved contractor list, and signup form are on the Company's website. Customers can only receive applications through their registered and approved contractor. Customers may also contact the Residential Customer Care center to request product information or guidance on how to obtain rebates.

## **D. Marketing Objectives & Strategies**

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<sup>2</sup>[www.xcelenergy.com/cotrades](http://www.xcelenergy.com/cotrades)

The Company will provide product information through the website and implement low-cost marketing tactics when available. The Company will also provide ~~Home Performance~~ Whole Home Efficiency information to the Customer Education team to promote at several “green” community events throughout the year. Trade partners may also be incentivized to identify participants that may not be aware of the “whole house option” through ~~Home Performance~~ Whole Home Efficiency.

Other products such as the Company’s Home Energy Audit product and Home Energy Squad Plus offering will offer information on ~~Home Performance~~ Whole Home Efficiency. The Company will monitor product participation on a monthly basis and implement additional marketing tactics if necessary, to achieve the year-end target.

In addition, the Company will attempt to utilize the trade partners who have been trained and contracted to deliver this product to customers. This is viewed as the most important marketing channel for building awareness and participation in the product. As a result, ~~T~~the Company is offering incentives to participating installation contractors designed to increase the number of projects performed. These incentives provide contractors with additional motivation to promote the ~~Home Performance~~ Whole Home Efficiency product.

## **E. Product-Specific Policies**

The ~~HPwES~~ Whole Home Efficiency product leverages the Company’s Home Energy Audit and Home Energy Squad Plus offerings, requiring an advanced in-home blower door audit as a prerequisite to product participation. Customers are eligible for a Home Energy Audit every two years. The Company will provide the customer a list of contractors participating in the product; however, the Company does not guarantee the contractor’s expertise or warrant any of the products or services, nor is one contractor promoted over another. The Company shall have no liability for contractor work or negligence. After the customer completes the audit and meets the product eligibility requirements, the customer may sign up to participate in ~~Home Performance~~ Whole Home Efficiency.

Customers will receive the standard prescriptive rebate for all installed measures. If a customer installs three or more qualifying measures, the customer will receive an additional bonus rebate of 10% of the prescriptive rebate amount for each measure completed within the two-year time period. The bonus rebate is a one-time offer for each measure completed.<sup>3</sup> The Company will not rebate pre-existing efficient equipment. Self-installations or installations done by non-registered contractors do not qualify for rebates.

The Company is looking into ways to provide a more comprehensive experience for our residential customers that simplifies the process of installing capital intensive energy efficient equipment. This may include an end-to-end solution where the customer chooses from any, or all, of the following as applicable:

- Advice and analysis of the available equipment options

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<sup>3</sup>Qualifying equipment is subject to change and customer must participate under current product rules designated by the current year in which the install the additional measures.

- Financing
- Enrollment in Demand Management products
- Assistance with choosing qualified contractors
- Enrollment in green programs and/or warranty services.

## **F. Stakeholder Involvement**

The Company periodically meets with the Cities of Boulder, Fort Collins, Greeley, and Colorado Springs, the Center for Resource Conservation, the Platte River Valley Authority, the Colorado Energy Office, the EPA, the DOE, Electric & Gas Industries Association, and the EEBC for product feedback. The Company plans to continue meeting with these organizations, and other stakeholders, for feedback to improve the product.

## **G. Rebates & Incentives**

~~Home Performance- Whole Home Efficiency~~ product rebates are prescriptive and based on the specific measures installed. The rebate amounts and eligibility requirements will be communicated through the ~~Home Performance- Whole Home Efficiency~~ collateral including the rebate application.

1.7 ENERGY STAR Clothes Washer

Algorithms

$$\begin{aligned} & \text{Customer kWh} \\ & = \left( \left( \frac{Cap \times N}{IMEF_{Base}} \right) \times \left( CW_{Base} + \frac{DHW_{Base} \times \% \text{ElectricDHW}}{R_{Eff}} + (DryBase \times \%ElecDry) \right) \right) \\ & - \left( \left( \frac{Cap \times N}{IMEF_{EE}} \right) \times \left( CW_{EE} + \frac{DHW_{EE} \times \% \text{ElectricDHW}}{R_{Eff}} + (DryEE \times \%ElecDry) \right) \right) \end{aligned}$$

$$\text{Customer Coincident kW} = \frac{\text{Customer kWh}}{\text{Hours}} \times \text{Coincidence Factor}$$

$$\begin{aligned} & \text{Customer Dth} \\ & = \left( \left( \frac{Cap \times N}{IMEF_{Base}} \right) \times \left( \frac{DHW_{Base} \times (1 - \% \text{ElectricDHW})}{R_{Eff}} + DryBase \times (1 - \%ElecDry) \right) \right) \\ & - \left( \left( \frac{Cap \times N}{IMEF_{EE}} \right) \times \left( \frac{DHW_{EE} \times (1 - \% \text{ElectricDHW})}{R_{Eff}} + DryEE \times (1 - \%ElecDry) \right) \right) \times 0.003412 \end{aligned}$$

$$\text{Non-Energy O\&M} = Cap \times N \times (IWF_{Base} - IWF_{EE}) \times \text{Water-Sewer-Rate}$$

Variables

Cap	3.45	Clothes washer drum capacity (ft <sup>3</sup> ). If unknown, assume 3.45ft <sup>3</sup> (Reference 1)
IMEF <sub>Base</sub>	Table 1.7.1	Integrated Modified Energy Factor for Federal Minimum equipment (ft <sup>3</sup> /kWh/cycle) (Reference 1)
IMEF <sub>EE</sub>	Table 1.7.1	Difference in cost between the standard equipment and the more efficient equipment
N	Table 1.7.1	Annual number of loads (Reference 1)
CW <sub>Base</sub>	7%	Percentage of total energy consumption for clothes washer operation for baseline equipment (Reference 1)
CW <sub>EE</sub>	6%	Percentage of total energy consumption for clothes washer operation for EnergyStar equipment (Reference 1)
DHW <sub>Base</sub>	33%	Percentage of total energy consumption for water heating for baseline equipment (Reference 1)
DHW <sub>EE</sub>	31%	Percentage of total energy consumption for water heating for EnergyStar equipment (Reference 1)
%Electric <sub>DHW</sub>	Table 1.7.2	Percent of domestic hot water savings assumed to be electric (Reference 1)
DryBase	59%	Percent of total energy consumption for dryer operation in baseline case.
DryEE	62%	Percent of total energy consumption for dryer operation in efficient case.
%ElecDry	See Table 1.2.7	Percent of dryer operation assumed to be electric.
IWF <sub>Base</sub>	See Table 1.1.7	Baseline Integrated Water Factor (Gal / cycle / cu.ft. ) for a standard clothes washer with a capacity of 1.6 cu.ft. or greater
IWF <sub>EE</sub>	See Table 1.1.7	EnergyStar Integrated Water Factor (Gal / cycle / cu.ft. ) for a clothes washer with a capacity of 1.6 cu.ft. or greater
Water-Sewer-Rate	\$0.008797	Water rate + Sewer rate per saved gallon of water.
Conversion Factor	0.0034120	convert kWh to Dtherms (factor is Dth/kWh)
Incremental Cost	\$50.00	Incremental Cost for EnergyStar Top Loading Clothes Washer
Incremental Cost	\$190.00	Incremental Cost for EnergyStar Front Loading Clothes Washer
R <sub>Eff</sub>	Table 1.7.2	Recovery efficiency (Reference 1)
Coincidence Factor	Table 1.7.1	Coincidence Factor (Reference 1)
Hours	Table 1.7.1	Annual Hours of Use (Reference 1)
Lifetime	11	Measured Lifetime (Reference 1)

Provided by Product Vendor or Customer

M&V Verified

Quantity of ENERGY STAR Clothes Washers Installed	Yes	
ENERGY STAR Clothes Washer Water Heater Fuel Type	Yes	Provide the Water Heater fuel type for the clothes washer's hot water; Electric or Natural Gas.
ENERGY STAR Clothes Washer-Sector	Yes	
Clothes Dryer Fuel Type	Yes	Provide the Clothes Dryer's fuel type; Electric or Natural Gas

Table 1.1.7 Sector-Breakout Clothes Washer Efficiency and Operational Information

Sector	Unit Type	IMEF <sub>Base</sub>	IMEF <sub>EE</sub>	N	Hours	Coincidence	IWF <sub>Base</sub>	IWF <sub>EE</sub>
Single-Family	Top and Front-Load-Average	1.64	2.24	258	258	3.8%		
	Top Loading	1.84	2.76	258	258	3.8%	6.5	4.3
	Front Loading	1.57	2.06	258	258	3.8%	4.7	3.7
Multi-Family	Commercial Front Load	2.00	2.20	1244	1244	4.5%		

Table 1.7.2 Washer Fuel Type by Factor

Fuel Type	%Electric <sub>DHW</sub>	R <sub>Eff</sub>	%ElecDry
Electric	100%	98%	100%
Gas	0%	78%	0%

References:

1. State of Minnesota Technical Reference Manual for Energy Conservation Improvement Programs Version 3.1 January 20, 2020
2. 2008 Database for Energy Efficient Resources, Version 2008.2.05, EUL/RUL Values, October 10, 2008.
3. Weighted average of 258 clothes washer cycles per year (based on 2015 Residential Energy Consumption Survey (RECS) national sample survey of housing appliances section, West North Central Region. nups4/www.eld.gov/Lurisumpuun/residential/data/2015/hc/phpi

DEEMED SAVINGS TECHNICAL ASSUMPTIONS

4. 10 CFR Parts 429 and 430 [Docket Number EERE-2008—BT—STD— 0019] RIN 1904—AB90 Energy Conservation Program: Energy Conservation Standards
5. The percentage of total energy consumption that is used for the machine, heating the hot water or by the dryer is different depending on the efficiency of the unit.
6. The percentage of total (gas and electric fuel types) water heating units that are electric calculated from 2015 Residential Energy Consumption Survey (RECS) data. <https://www.2ia.gov/consumption/residential/data/2015/hc/php/hc8.7.phr> Fuel used by main water heater section.
7. The percentage of total (gas and electric fuel types) dryer units that are electric calculated from 2015 Residential Energy Consumption Survey (RECS) data.
8. To account for the different efficiency of electric and Natural Gas hot water heaters (gas water heater): recovery efficiencies ranging from 0.74 to 0.85 (0.78)
9. Calculated from Itron eShapes, 8,760 hourly data by end-use for Missouri, as provided by Ameren. Reference is from Illinois Technical Reference Manual June
10. Clothes Washer Program Requirements Version 7.0.  
<https://www.energystar.gov/certified-products/sites/products/uploads/files/ENERGY%20STAR%20Final%20Version%207%20Clothes>
11. Clothes Washer Program Requirements Version 8.0.
12. ENERGY STAR Calculator. [https://www.energystar.gov/sites/default/files/asset/document/appliance\\_calculator.xlsx](https://www.energystar.gov/sites/default/files/asset/document/appliance_calculator.xlsx)
13. Based on the average clothes washer volume of all units that pass the new Federal Standard on the California Energy Commission (CEC) database of Clothes
14. Department of Energy. Energy Efficiency Program for certain commercial and industrial equipment
15. Department of Energy: Energy Savings Potential and RD&D Opportunities for Commercial Building Appliances Report. 2009.
16. 2015 Residential Energy Consumption Survey (RECS) Data
17. California Public Utilities District. Res Retro HIM Evaluation Report. Weighted by quantity of each efficiency level from MESP SPECTRUM. Reference it from

**Changes from Recent Filing:**



Program	Measure Group	Measure Lifetime (years)	Rebate Amount (\$)	Incremental Cost (\$)	Annual Customer kWh Savings (kWh/yr)	Annual Customer Peak Coincident Demand Savings (PCKW)	Gas Savings (Dth)	Non-Energy O&M Savings (\$)	Electric NTG (%)	Gas NTG (%)	Install Rate (%)	2021 Electric Units	2022 Electric Units	2021 Gas Units	2022 Gas Units
Whole Home Efficiency	Air Sealing - Electric Heating and Cooling	10	\$182	\$932	1,994	0.139	0.0	\$0.00	116%	116%	100%	19	24	0	0
Whole Home Efficiency	Air Sealing - Electric Heating Only	10	\$181	\$952	2,098	0.000	0.0	\$0.00	116%	116%	100%	31	39	0	0
Whole Home Efficiency	Air Sealing - Gas Heating / Electric Cooling	10	\$143	\$921	115	0.195	15.5	\$0.00	116%	116%	100%	55	69	55	69
Whole Home Efficiency	Air Sealing - Gas Heating Only	10	\$181	\$977	0	0.000	14.9	\$0.00	116%	116%	100%	0	0	23	29
Whole Home Efficiency	Attic Insulation - Electric Heating and Cooling	20	\$341	\$1,523	1,204	0.129	0.0	\$0.00	116%	116%	100%	10	12	0	0
Whole Home Efficiency	Attic Insulation - Electric Heating Only	20	\$364	\$1,749	2,756	0.000	0.0	\$0.00	116%	116%	100%	10	12	0	0
Whole Home Efficiency	Attic Insulation - Gas Heating / Electric Cooling	20	\$321	\$1,898	129	0.219	12.0	\$0.00	116%	116%	100%	65	82	60	75
Whole Home Efficiency	Attic Insulation - Gas Heating Only	20	\$373	\$1,856	0	0.000	15.3	\$0.00	116%	100%	100%	0	0	15	19
Whole Home Efficiency	ENERGY STAR Clothes Dryer	12	\$30	\$75	83	0.009	0.0	\$0.00	116%	116%	100%	55	85	15	25
Whole Home Efficiency	ENERGY STAR Clothes Washer	11	\$30	\$75	78	0.011	3.8	\$0.00	116%	116%	100%	55	85	65	100
Whole Home Efficiency	Energy Star Smart Thermostat	10	\$50	\$215	142	0.215	5.4	\$0.00	100%	100%	100%	80	105	60	80
Whole Home Efficiency	Heat Pump Water Heater	12	\$705	\$1,059	2,687	0.354	0.0	\$8.33	116%	116%	100%	28	44	0	0
Whole Home Efficiency	Heat Pump Water Heater - Gas WH Baseline	12	\$800	\$982	27	0.000	16.0	\$0.00	116%	116%	100%	0	0	2	6
Whole Home Efficiency	High Efficiency AC with Qi	18	\$500	\$953	477	0.529	0.0	\$0.00	116%	116%	100%	25	35	0	0
Whole Home Efficiency	High Efficiency AC without Qi and associated furnace	18	\$300	\$369	199	0.208	0.0	\$0.00	116%	116%	100%	3	3	0	0
Whole Home Efficiency	High Efficiency ASHP and Electric Resistance Heat Backup with Qi	18	\$800	\$583	9,892	0.403	0.0	\$0.00	100%	100%	100%	1	1	0	0
Whole Home Efficiency	High Efficiency ccASHP with Qi with Electric Resistance Backup	18	\$1,000	\$3,983	13,076	0.398	0.0	\$0.00	100%	100%	100%	1	1	0	0
Whole Home Efficiency	High Efficiency Cold Climate Mini-Split Heat Pump with Electric Resistance Backup	18	\$600	\$5,983	7,531	0.532	0.0	\$0.00	100%	116%	100%	1	1	0	0
Whole Home Efficiency	High Efficiency Dual Fuel ASHP with Qi and associated furnace	18	\$800	\$938	302	0.459	56.1	\$0.00	100%	100%	100%	4	4	4	4
Whole Home Efficiency	High Efficiency Dual Fuel ccASHP with Qi and associated furnace	18	\$1,000	\$3,933	498	0.393	57.8	\$0.00	116%	116%	100%	1	1	1	1
Whole Home Efficiency	High Efficiency Dual Fuel Cold Climate Mini-Split Heat Pump	18	\$600	\$5,983	107	0.532	36.3	\$0.00	116%	116%	100%	1	1	1	1
Whole Home Efficiency	High Efficiency Dual Fuel Mini-Split Heat Pump	18	\$500	\$6,855	242	0.981	46.9	\$0.00	100%	100%	100%	4	4	4	4
Whole Home Efficiency	High Efficiency Furnace	18	\$300	\$1,138	0	0.000	21.3	\$0.00	100%	100%	100%	0	0	25	40
Whole Home Efficiency	High Efficiency GSHP with Qi	20	\$945	\$10,107	11,734	1.472	0.0	\$0.00	100%	116%	100%	1	1	0	0
Whole Home Efficiency	High Efficiency GSHP with Qi - AC & Gas Baseline	20	\$1,259	\$4,853	686	1.472	60.1	\$0.00	116%	116%	100%	1	1	1	1
Whole Home Efficiency	High Efficiency Mini-Split Heat Pump	18	\$500	\$6,855	8,933	0.981	0.0	\$0.00	100%	100%	100%	1	1	0	0
Whole Home Efficiency	Premium evaporative cooler	15	\$675	-\$755	1,156	1.495	0.0	-\$18.13	116%	116%	100%	9	16	0	0
Whole Home Efficiency	Quality Install of High Efficiency AC with associated furnace	18	\$200	\$235	153	0.143	4.6	\$0.00	100%	100%	100%	5	10	5	10
Whole Home Efficiency	Smart Thermostat Optimization	1	\$0	\$0	45	0.054	0.0	\$0.00	100%	100%	100%	9	12	9	12
Whole Home Efficiency	Standard Efficiency AC with Qi	18	\$200	\$184	196	0.113	0.0	\$0.00	116%	116%	100%	20	25	0	0
Whole Home Efficiency	Standard Efficiency AC with Qi and associated furnace	18	\$200	\$237	248	0.201	5.5	\$0.00	100%	100%	100%	5	10	5	10
Whole Home Efficiency	Tankless Water Heater	20	\$100	\$960	0	0.000	7.4	\$0.00	100%	100%	100%	0	0	140	175
Whole Home Efficiency	Wall Insulation - Electric Heating and Cooling	20	\$350	\$3,521	7,246	0.554	0.0	\$0.00	116%	116%	100%	2	6	0	0
Whole Home Efficiency	Wall Insulation - Electric Heating Only	20	\$350	\$3,521	6,884	0.000	0.0	\$0.00	116%	116%	100%	2	6	0	0
Whole Home Efficiency	Wall Insulation - Gas Heating / Electric Cooling	20	\$106	\$8,563	307	0.520	28.4	\$0.00	116%	116%	100%	43	54	45	60
Whole Home Efficiency	Wall Insulation - Gas Heating Only	20	\$324	\$8,563	0	0.000	33.1	\$0.00	116%	100%	100%	0	0	6	8

<b>WHOLE HOME EFFICIENCY</b>				
<b>2021 Net Present Cost Benefit Summary Analysis For All Participants</b>				
	<b>Participant Test (\$Total)</b>	<b>Utility Test (\$Total)</b>	<b>Rate Impact Test (\$Total)</b>	<b>Modified Total Resource Test (\$Total)</b>
<b>Benefits</b>				
<b>Avoided Revenue Requirements</b>				
Generation Capacity	N/A	\$161,330	\$161,330	\$161,330
Trans. & Dist. Capacity	N/A	\$20,204	\$20,204	\$20,204
Marginal Energy	N/A	\$109,930	\$109,930	\$109,930
Avoided Emissions (CO2)	N/A	N/A	N/A	\$88,582
Subtotal				\$380,047
<b>Non-Energy Benefits Adder (20.0%)</b>				
Subtotal	N/A	\$291,465	\$291,465	\$438,340
<b>Participant Benefits</b>				
Bill Reduction - Electric	\$601,921	N/A	N/A	N/A
Participant Rebates and Incentives	\$87,346	N/A	N/A	\$87,346
Incremental Capital Savings	\$6,584	N/A	N/A	\$7,638
Incremental O&M Savings	\$2,657	N/A	N/A	\$3,082
Subtotal	\$698,508	N/A	N/A	\$98,066
<b>Total Benefits</b>	<b>\$698,508</b>	<b>\$291,465</b>	<b>\$291,465</b>	<b>\$536,406</b>
<b>Costs</b>				
<b>Utility Project Costs</b>				
Program Planning & Design	N/A	\$0	\$0	\$0
Administration & Program Delivery	N/A	\$93,112	\$93,112	\$93,112
Advertising/Promotion/Customer Ed	N/A	\$0	\$0	\$0
Participant Rebates and Incentives	N/A	\$87,346	\$87,346	\$87,346
Equipment & Installation	N/A	\$0	\$0	\$0
Measurement and Verification	N/A	\$20,000	\$20,000	\$20,000
Subtotal	N/A	\$200,458	\$200,458	\$200,458
<b>Utility Revenue Reduction</b>				
Revenue Reduction - Electric	N/A	N/A	\$591,106	N/A
Subtotal	N/A	N/A	\$591,106	N/A
<b>Participant Costs</b>				
Incremental Capital Costs	\$350,216	N/A	N/A	\$368,331
Incremental O&M Costs	\$4,397	N/A	N/A	\$5,101
Subtotal	\$354,613	N/A	N/A	\$373,432
<b>Total Costs</b>	<b>\$354,613</b>	<b>\$200,458</b>	<b>\$791,564</b>	<b>\$573,890</b>
<b>Net Benefit (Cost)</b>	<b>\$343,895</b>	<b>\$91,007</b>	<b>(\$500,099)</b>	<b>(\$37,484)</b>
<b>Benefit/Cost Ratio</b>	<b>1.97</b>	<b>1.45</b>	<b>0.37</b>	<b>0.93</b>

Note: Dollar values represent present value of impacts accumulated over the lifetime of the measures.

<b>2021 ELECTRIC</b>		<b>GOAL</b>
<b>Input Summary and Totals</b>		
<b>Program "Inputs" per Customer kW and per Participant</b>		
Lifetime (Weighted on Generator kWh)	A	14.2 years
T & D Loss Factor (Energy)	B	6.38%
T & D Loss Factor (Demand)	C	9.13%
Net-to-Gross (Energy)	D	114.58%
Net-to-Gross (Demand)	E	112.54%
<b>Installation Rate (Energy)</b>	<b>F</b>	<b>100.00%</b>
<b>Installation Rate (Demand)</b>	<b>G</b>	<b>100.00%</b>
Net coincident kW Saved at Generator	H	0.28 kW
Gross Annual kWh Saved at Customer	I	730.07 kWh
Net Annual kWh Saved at Generator	J	893.54 kWh
<b>Program Summary All Participants</b>		
<b>Total Budget</b>	<b>K</b>	<b>\$200,458</b>
<b>Net coincident kW Saved at Generator</b>	<b>L</b>	<b>153 kW</b>
Gross Annual kWh Saved at Customer	M	399,346 kWh
<b>Net Annual kWh Saved at Generator</b>	<b>N</b>	<b>488,764 kWh</b>
<b>Total MTRC Net Benefits with Adder</b>	<b>O</b>	<b>(\$37,484)</b>
<b>Total MTRC Net Benefits without Adder</b>	<b>P</b>	<b>(\$95,777)</b>
<b>Utility Program Cost per kWh Lifetime</b>		
	K/(A x N)	<b>\$0.0288</b>
<b>Utility Program Cost per kW at Gen</b>		
	K/ L	<b>\$1,314</b>
<b>Avoided Lifetime CO2 Emissions, Total Program (tons CO2)</b>		
		<b>2,260</b>

<b>WHOLE HOME EFFICIENCY</b>				
<b>2022 Net Present Cost Benefit Summary Analysis For All Participants</b>				
	<b>Participant Test (\$Total)</b>	<b>Utility Test (\$Total)</b>	<b>Rate Impact Test (\$Total)</b>	<b>Modified Total Resource Test (\$Total)</b>
<b>Benefits</b>				
<b>Avoided Revenue Requirements</b>				
Generation Capacity	N/A	\$226,096	\$226,096	\$226,096
Trans. & Dist. Capacity	N/A	\$28,316	\$28,316	\$28,316
Marginal Energy	N/A	\$165,375	\$165,375	\$165,375
Avoided Emissions (CO2)	N/A	N/A	N/A	\$123,847
Subtotal				\$543,633
<b>Non-Energy Benefits Adder (20.0%)</b>				
Subtotal	N/A	\$419,786	\$419,786	\$627,591
<b>Participant Benefits</b>				
Bill Reduction - Electric	\$894,715	N/A	N/A	N/A
Participant Rebates and Incentives	\$122,532	N/A	N/A	\$122,532
Incremental Capital Savings	\$12,077	N/A	N/A	\$14,009
Incremental O&M Savings	\$4,201	N/A	N/A	\$4,873
Subtotal	\$1,033,525	N/A	N/A	\$141,414
<b>Total Benefits</b>	<b>\$1,033,525</b>	<b>\$419,786</b>	<b>\$419,786</b>	<b>\$769,004</b>
<b>Costs</b>				
<b>Utility Project Costs</b>				
Program Planning & Design	N/A	\$0	\$0	\$0
Administration & Program Delivery	N/A	\$109,926	\$109,926	\$109,926
Advertising/Promotion/Customer Ed	N/A	\$0	\$0	\$0
Participant Rebates and Incentives	N/A	\$122,532	\$122,532	\$122,532
Equipment & Installation	N/A	\$0	\$0	\$0
Measurement and Verification	N/A	\$30,000	\$30,000	\$30,000
Subtotal	N/A	\$262,458	\$262,458	\$262,458
<b>Utility Revenue Reduction</b>				
Revenue Reduction - Electric	N/A	N/A	\$877,576	N/A
Subtotal	N/A	N/A	\$877,576	N/A
<b>Participant Costs</b>				
Incremental Capital Costs	\$453,171	N/A	N/A	\$478,263
Incremental O&M Costs	\$6,761	N/A	N/A	\$7,843
Subtotal	\$459,932	N/A	N/A	\$486,106
<b>Total Costs</b>	<b>\$459,932</b>	<b>\$262,458</b>	<b>\$1,140,034</b>	<b>\$748,564</b>
<b>Net Benefit (Cost)</b>	<b>\$573,593</b>	<b>\$157,329</b>	<b>(\$720,248)</b>	<b>\$20,441</b>
<b>Benefit/Cost Ratio</b>	<b>2.25</b>	<b>1.60</b>	<b>0.37</b>	<b>1.03</b>

Note: Dollar values represent present value of impacts accumulated over the lifetime of the measures.

<b>2022 ELECTRIC</b>		<b>GOAL</b>
<b>Input Summary and Totals</b>		
<b>Program "Inputs" per Customer kW and per Participant</b>		
Lifetime (Weighted on Generator kWh)	A	14.5 years
T & D Loss Factor (Energy)	B	6.38%
T & D Loss Factor (Demand)	C	9.13%
Net-to-Gross (Energy)	D	114.85%
Net-to-Gross (Demand)	E	112.80%
<b>Installation Rate (Energy)</b>	<b>F</b>	<b>100.00%</b>
<b>Installation Rate (Demand)</b>	<b>G</b>	<b>100.00%</b>
Net coincident kW Saved at Generator	H	0.28 kW
Gross Annual kWh Saved at Customer	I	759.59 kWh
Net Annual kWh Saved at Generator	J	931.81 kWh
<b>Program Summary All Participants</b>		
<b>Total Budget</b>	<b>K</b>	<b>\$262,458</b>
<b>Net coincident kW Saved at Generator</b>	<b>L</b>	<b>210 kW</b>
Gross Annual kWh Saved at Customer	M	569,694 kWh
<b>Net Annual kWh Saved at Generator</b>	<b>N</b>	<b>698,861 kWh</b>
<b>Total MTRC Net Benefits with Adder</b>	<b>O</b>	<b>\$20,441</b>
<b>Total MTRC Net Benefits without Adder</b>	<b>P</b>	<b>(\$63,517)</b>
<b>Utility Program Cost per kWh Lifetime</b>	<b>K/(A x N)</b>	<b>\$0.0258</b>
<b>Utility Program Cost per kW at Gen</b>	<b>K/ L</b>	<b>\$1,248</b>
<b>Avoided Lifetime CO2 Emissions, Total Program (tons CO2)</b>		<b>3,045</b>

**WHOLE HOME EFFICIENCY**

2021 Net Present Cost Benefit Summary Analysis For All Participants

	Participant Test (\$Total)	Utility Test (\$Total)	Rate Impact Test (\$Total)	Modified Total Resource Test (\$Total)
<b>Benefits</b>				
<b>Avoided Revenue Requirements</b>				
Commodity Cost Reduction	N/A	\$234,334	\$234,334	\$234,334
Variable O&M Savings	N/A	\$3,821	\$3,821	\$3,821
Demand Savings	N/A	\$26,764	\$26,764	\$26,764
Subtotal				\$264,918
Non-Energy Benefits Adder (20.0%)				\$52,984
Subtotal	N/A	\$264,918	\$264,918	\$317,902
<b>Participant Benefits</b>				
Bill Reduction - Gas	\$444,790	N/A	N/A	N/A
Participant Rebates and Incentives	\$69,881	N/A	N/A	\$69,881
Incremental Capital Savings	\$0	N/A	N/A	\$0
Incremental O&M Savings	\$5,500	N/A	N/A	\$6,380
Subtotal	\$520,171	N/A	N/A	\$76,261
<b>Total Benefits</b>	<b>\$520,171</b>	<b>\$264,918</b>	<b>\$264,918</b>	<b>\$394,163</b>
<b>Costs</b>				
<b>Utility Project Costs</b>				
Program Planning & Design	N/A	\$0	\$0	\$0
Administration & Program Delivery	N/A	\$58,811	\$58,811	\$58,811
Advertising/Promotion/ Customer Ed	N/A	\$0	\$0	\$0
Participant Rebates and Incentives	N/A	\$69,881	\$69,881	\$69,881
Equipment & Installation	N/A	\$0	\$0	\$0
Measurement and Verification	N/A	\$20,000	\$20,000	\$20,000
Subtotal	N/A	\$148,692	\$148,692	\$148,692
<b>Utility Revenue Reduction</b>				
Revenue Reduction - Gas	N/A	N/A	\$417,686	N/A
Subtotal	N/A	N/A	\$417,686	N/A
<b>Participant Costs</b>				
Incremental Capital Costs	\$433,180	N/A	N/A	\$455,163
Incremental O&M Costs	\$0	N/A	N/A	\$0
Subtotal	\$433,180	N/A	N/A	\$455,163
<b>Total Costs</b>	<b>\$433,180</b>	<b>\$148,692</b>	<b>\$566,379</b>	<b>\$603,855</b>
<b>Net Benefit (Cost)</b>	<b>\$86,991</b>	<b>\$116,226</b>	<b>(\$301,460)</b>	<b>(\$209,692)</b>
<b>Benefit/Cost Ratio</b>	<b>1.20</b>	<b>1.78</b>	<b>0.47</b>	<b>0.65</b>

Note: Dollar values represent present value of impacts accumulated over the lifetime of the measures.

**2021 GAS**

**GOAL**

<b>Input Summary and Totals</b>		
<b>Program "Inputs" per Dth</b>		
Lifetime (Weighted on Dth)	A	16.8 years
Net-to-Gross (Weighted on Dth)	B	111.07%
Install Rate (Weighted on Dth)	C	100.00%
<b>Program Summary per Participant</b>		
Gross Annual Dth Saved	D	12.1
Net Annual Dth Saved	E	13.5
<b>Program Summary All Participants</b>		
<b>Total Budget</b>	F	<b>\$148,692</b>
Gross Annual Dth Saved	G	<b>6,552 Dth</b>
Net Annual Dth Saved	H	<b>7,277 Dth</b>
<b>Total MTRC Net Benefits with Adder</b>	I	<b>(\$209,692)</b>
<b>Total MTRC Net Benefits without Adder</b>	J	<b>(\$262,676)</b>
<b>Utility Program Cost per Dth Lifetime</b>	F / (A x H)	<b>\$1.2198</b>

**WHOLE HOME EFFICIENCY**

2022 Net Present Cost Benefit Summary Analysis For All Participants

	Participant Test (\$Total)	Utility Test (\$Total)	Rate Impact Test (\$Total)	Modified Total Resource Test (\$Total)
<b>Benefits</b>				
<b>Avoided Revenue Requirements</b>				
Commodity Cost Reduction	N/A	\$318,886	\$318,886	\$318,886
Variable O&M Savings	N/A	\$4,993	\$4,993	\$4,993
Demand Savings	N/A	\$34,972	\$34,972	\$34,972
Subtotal				\$358,850
Non-Energy Benefits Adder (20.0%)				\$71,770
Subtotal	N/A	\$358,850	\$358,850	\$430,620
<b>Participant Benefits</b>				
Bill Reduction - Gas	\$603,966	N/A	N/A	N/A
Participant Rebates and Incentives	\$94,340	N/A	N/A	\$94,340
Incremental Capital Savings	\$0	N/A	N/A	\$0
Incremental O&M Savings	\$8,669	N/A	N/A	\$10,056
Subtotal	\$706,976	N/A	N/A	\$104,396
<b>Total Benefits</b>	<b>\$706,976</b>	<b>\$358,850</b>	<b>\$358,850</b>	<b>\$535,016</b>
<b>Costs</b>				
<b>Utility Project Costs</b>				
Program Planning & Design	N/A	\$0	\$0	\$0
Administration & Program Delivery	N/A	\$72,360	\$72,360	\$72,360
Advertising/Promotion/Customer Ed	N/A	\$0	\$0	\$0
Participant Rebates and Incentives	N/A	\$94,340	\$94,340	\$94,340
Equipment & Installation	N/A	\$0	\$0	\$0
Measurement and Verification	N/A	\$30,000	\$30,000	\$30,000
Subtotal	N/A	\$196,700	\$196,700	\$196,700
<b>Utility Revenue Reduction</b>				
Revenue Reduction - Gas	N/A	N/A	\$568,396	N/A
Subtotal	N/A	N/A	\$568,396	N/A
<b>Participant Costs</b>				
Incremental Capital Costs	\$561,344	N/A	N/A	\$588,723
Incremental O&M Costs	\$0	N/A	N/A	\$0
Subtotal	\$561,344	N/A	N/A	\$588,723
<b>Total Costs</b>	<b>\$561,344</b>	<b>\$196,700</b>	<b>\$765,096</b>	<b>\$785,423</b>
<b>Net Benefit (Cost)</b>	<b>\$145,632</b>	<b>\$162,150</b>	<b>(\$406,245)</b>	<b>(\$250,406)</b>
<b>Benefit/Cost Ratio</b>	<b>1.26</b>	<b>1.82</b>	<b>0.47</b>	<b>0.68</b>

Note: Dollar values represent present value of impacts accumulated over the lifetime of the measures.

**2022**

**GAS**

**GOAL**

<b>Input Summary and Totals</b>		
<b>Program "Inputs" per Dth</b>		
Lifetime (Weighted on Dth)	A	16.7 years
Net-to-Gross (Weighted on Dth)	B	111.23%
Install Rate (Weighted on Dth)	C	100.00%
<b>Program Summary per Participant</b>		
Gross Annual Dth Saved	D	11.7
Net Annual Dth Saved	E	13.1
<b>Program Summary All Participants</b>		
<b>Total Budget</b>	F	<b>\$196,700</b>
Gross Annual Dth Saved	G	<b>8,561 Dth</b>
Net Annual Dth Saved	H	<b>9,522 Dth</b>
<b>Total MTRC Net Benefits with Adder</b>	I	<b>(\$250,406)</b>
<b>Total MTRC Net Benefits without Adder</b>	J	<b>(\$322,176)</b>
<b>Utility Program Cost per Dth Lifetime</b>	F / (A x H)	<b>\$1.2369</b>