Atmos Energy 2024-2028 Clean Heat Plan

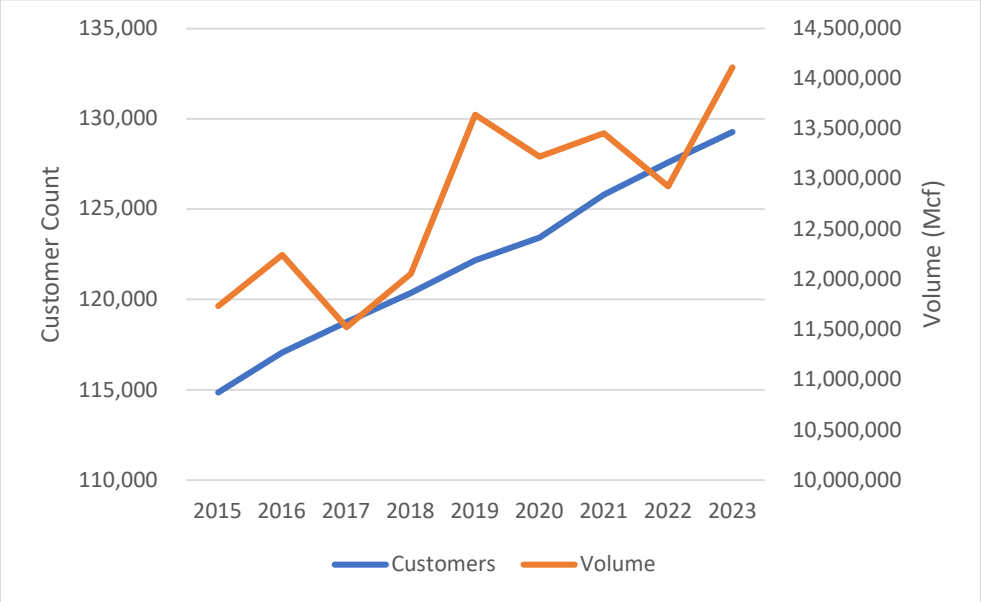
Table of Contents

Introduction

As the country's largest **natural-gas-only** distributor, Atmos Energy Corporation ("Atmos Energy" or the "Company") believes that natural gas is essential for meeting the nation's energy demands and a lower carbon economy. Colorado residents, in particular, understand the value of natural gas service as a reliable and cost-effective source of energy.

According to the most recent data available from the United States Energy Information Administration ("EIA"), 83% of residential homes in Colorado rely upon natural gas service,[1] which in **Atmos Energy's service territory saves customers an estimated $1,100 annually with 36% less greenhouse gas ("GHG") emissions as compared to an all-electric home**.[2] Coloradans continue to value the service Atmos Energy provides, which can be demonstrated through the steady growth in customers over the last nine years, resulting in 12.6% more customers today than in 2015. Figure 1 below shows the growth both in customers and in gas volume[3] from 2015 to 2023 on the Atmos Energy system.

Figure 1. Customer Count and System Throughput 2015-2023



In 2021, the State of Colorado passed legislation (SB 21-264) requiring natural gas utilities to develop Clean Heat Plans ("CHP"). The CHP requirements are based on a 4% reduction of GHG emissions by 2025, as compared to a 2015 baseline, and a 22% reduction in GHG emissions by 2030, as compared to a 2015 baseline, using a variety of Clean Heat Resources. This legislation was codified into § 40-3.2-108, C.R.S., and Rules 4725-4733 by the Colorado Public Utilities Commission (the "Commission").

---

[1] https://www.eia.gov/todayinenergy/detail.php?id=55940

[2] Determined using the GTI Energy's "Energy Planning Analysis Tool" (EPAT), https://cmicepatcalc.gti.energy.

[3] This data is not weather-normalized.

Atmos Energy's CHP has been developed in alignment with Atmos Energy's obligation to provide natural gas service in the State of Colorado, its belief that natural gas is essential for meeting the nation's energy demands and supporting a lower carbon economy in a cost-effective manner, and the requirements of § 40-3.2-108, C.R.S.

Further, the CHP has been developed in alignment with the State of Colorado's fundamental principle of ratemaking. The measures selected for inclusion in the CHP portfolios described herein are consistent with these ratemaking principles, so that (1) the costs ultimately charged to customers are costs associated with the provision of gas service and (2) the CHP is implemented in a cost-effective manner that provides benefits to customers.

Finally, Atmos Energy's CHP recognizes the fact that innovation and implementation of efficient natural gas direct-use technologies has accelerated dramatically in recent years, which the Company has realized in the adoption of those technologies by its Colorado customers.[4] Energy efficiency ("EE") programs are the most impactful opportunity to reduce emissions, while maintaining customer choice, lowering energy bills, and reducing overall energy consumption. Although current natural gas space and water heating equipment can achieve efficiency ratings close to 100%, new technologies being developed and becoming available on the market are capable of achieving efficiency ratings of 130% - 140%.[5] The successful adoption of these technologies would result in significant reductions in natural gas energy end-use and thus in GHG emissions, at affordable rates. In fact, studies have shown that widespread adoption of these emerging natural gas technologies is the most cost-effective way to reduce GHG emissions reductions and could result in reductions of 40% in the residential sector alone.[6] In addition to the costs savings associated with choosing natural gas appliances over electricity, adoption of these technologies results in additional incremental savings for customers estimated to be an average of $232 per year nationally.[7]

As further demonstration of the role that natural gas plays in our energy future, Atmos Energy has partnered with Habitat for Humanity to build Zero Net Energy ("ZNE") homes that are designed to produce as much energy as they consume at an affordable cost to the homeowner. These homes use high-efficiency Energy Star natural gas appliances, rooftop solar panels and high-performance building materials and insulation. These homes demonstrate the value and comfort of natural gas energy efficient homes with significantly reduced GHG emissions and more affordable energy bills for families.

---

[4] *See* Direct Testimony of Stephanie Engwall, p. 15 ("The Company's Colorado DSM Program has been successful over its twelve-year history, saving customers over 2.3 million therms of energy since the program started, which equates to a GHG emissions reduction of over 12,200 MT CO2e. These savings have grown over time, with customers savings exceeding 400,000 therms, or 2,100 MT CO2e, in each of the last two program years (2021 and 2022).").

[5] Zabors, Bob et al. "Opportunities for Reducing Greenhouse Gas Emissions through Emerging Natural Gas Direct-Use Technologies," Dec. 2019, p. 45.

[6] *Id.* At p.8.

[7] *Id*.

Apex Analytics, LLC, ("Apex") was retained by Atmos Energy to assist with the identification and review of potential clean heat measures and the development of the three portfolios included in this CHP proceeding. Apex has previously worked with Atmos Energy to develop its Demand-Side Management ("DSM") potential study and is also involved in developing and implementing Atmos Energy's current DSM plans. As such, Apex is well versed in identifying additional EE measures that can feasibly be implemented within Atmos Energy's service territory. Outside of their work with Atmos Energy, Apex has expertise in other DSM options, natural gas alternatives, and non-pipeline alternatives.

This report is organized into three sections:

Section 1 contains a series of forecasts related to system GHG emissions, sales throughput, and customer counts. This section also contains the GHG emission reduction targets for each year as required by § 40-3.2-108, C.R.S. Lastly, this section includes emission baseline data and a description of how those baseline emissions values were calculated.

Section 2 provides a deep dive into each of the three CHP portfolios prepared by Atmos Energy. Each portfolio description includes a list of the resources utilized in each portfolio, the annual and total costs to implement the portfolio, impacts for income qualified customers, annual and cumulative GHG reductions, projected costs and benefits, and annual cost impacts.

Section 3 provides an overview of two pilot projects that Atmos Energy believes are worthy of funding due to their potential impact and GHG emission reductions. This section provides a narrative description of each demonstration project, its costs, and its GHG reduction potential.

Summary of Clean Heat Portfolio Analysis

This CHP filing contains three different portfolios in accordance with Rule 4731(b). Table 1 below briefly summarizes the three portfolios, which clean heat resources are in each portfolio, their costs, and the estimated GHG emission reductions. Note the carbon dioxide equivalents ("CO2e") reductions that are derived from Atmos Energy's ongoing pipeline replacement program and other elements of its comprehensive environmental strategy are not reflected in these estimated emission reductions.

Table 1. Clean Heat Plan Portfolio Summary

Portfolio	Elements	CO2e Reductions[8]	Cost
Least Cost	EE:[9] • Behavior, thermostats, envelope measures, boiler/furnace upgrades, water heater upgrades, high-efficiency New Construction, equipment tune-ups, strategic energy management ("SEM"), controls, showerheads • Enhanced incentives for most cost-effective measures (including gas equipment replaced on burnout) and additional measures not included in DSM because of poor cost-effectiveness (including gas equipment early retirements) Recovered Methane	30,957 MT in 2030	$17M over 5 years
Emissions Target	EE: • Behavior, thermostats, envelope measures, boiler/furnace upgrades, water heater upgrades, high-efficiency New Construction, equipment tune-ups, SEM, controls, showerheads • All EE measures from potential study, with nothing screened out for poor cost-effectiveness Pilot Projects: • Residential Gas Heat Pumps • Manufactured Homes Replacements Recovered Methane	292,088 MT in 2030	$274.74M over 5 years
Preferred	EE: • Behavior, thermostats, envelope measures, boiler/furnace upgrades, water heater upgrades, high efficiency New Construction, equipment tune-ups, strategic energy management (SEM), controls, showerheads Pilot Projects: • Residential Gas Heat Pumps • Manufactured Homes Replacements Recovered Methane	31,081 MT in 2030	$17.46M over 5 years

[8] CO2e Reductions include those achieved through portfolios and through Planned DSM described herein.

[9] Energy Efficiency listed in all three portfolios is illustrative but not comprehensive. The full list of EE measures can be found in the Atmos Colorado Natural Gas Market Potential Study, submitted as Attachment JLC-1 to the direct testimony of Jane Colby.

Portfolio A – "Least Cost" Portfolio

This portfolio was designed to maximize emissions reductions while spending no more than 2.5% of annual gas bills. This is accomplished by expanding customer EE measures beyond what is currently available in Atmos Energy's DSM Program. Recognizing that this expansion would require a ramp-up period to reach the maximum spending target, these EE measures are supplemented with recovered methane ("RM")[10] until the spending target can be achieved solely with additional EE measures. This portfolio is capped at expenditures of $3.4 million per year, which is approximately 2.5% of Atmos Energy's annual revenues. When combined with the reductions from the Planned DSM expansion, this portfolio is estimated to result in reductions of 30,957 metric tons ("MT") CO2e in 2030. The cost of this portfolio is $17 million over 5 years.

Portfolio B – "Emissions Target" Portfolio

This portfolio was designed to illustrate a portfolio meeting the GHG emissions reduction target irrespective of budgetary considerations. In addition to the most cost-effective EE measures using long-existing efficient natural gas technologies included in the Least Cost portfolio, the Emissions Target portfolio also includes EE measures using less cost-effective measures as well as newer technological approaches that are currently higher cost, including residential gas heat pumps and a pilot focused on replacing manufactured homes with upgraded units complete with robust envelope measures and efficient appliances. Higher levels of RM are included in this portfolio to address the remaining GHG emissions reductions to reach the target. The cost of this portfolio is $274.74 million over 5 years. When combined with the reductions from the Planned DSM expansion, this portfolio is estimated to result in reductions of 292,088 MT CO2e in 2030.

Portfolio C – "Preferred" Portfolio

Atmos Energy believes that the preferred approach to GHG emissions reduction balances the goals of reducing GHG emissions while limiting the cost impact to our customers. This portfolio consists of the most cost-effective EE measures using long-existing efficient natural gas technologies, during the EE ramp-up period, incentives for the use of newer direct-use technologies, including residential gas heat pumps, and a pilot program focused on replacing manufactured homes with upgraded units complete with robust envelope measures and efficient natural gas appliances that would become available housing for customers in place of older, less efficient models. This pilot will have benefits at multiple levels—emission reductions from better-weatherized mobile homes with more efficient natural gas appliances and HVAC systems, but also the monthly savings in energy costs that can be achieved for those occupying these homes, particularly benefiting the low-income customers in Atmos Energy's service territory. The cost of this portfolio is $17.46 million over 5 years. When combined with the reductions from the Planned DSM expansion, this portfolio is estimated to result in reductions of 31,081 MT CO2e in 2030.

[10] 21-264 defines "Recovered Methane" as biomethane or methane derived from municipal solid waste, pyrolysis of municipal solid waste, biomass pyrolysis or enzymatic biomass, or wastewater treatment.

Potential Obstacles to Clean Heat Plan Implementation

Meeting the state's ambitious GHG reduction goals under the parameters outlined in § 40-3.2-108, C.R.S., will not be without its challenges, which are described below.

Recognition of Customer Growth – One significant challenge with reducing absolute emissions using 2015 as a baseline is that there has been significant customer growth in Atmos Energy's service territory since 2015. Figure 1 above shows the growth in customers and gas volume from 2015 to 2023 on the Atmos Energy system. This data demonstrates that Atmos Energy has experienced steady growth in customers over the last nine years, resulting in 12.6% more customers today than in 2015. While the growth in natural gas volume without weather normalization appears to be a bit more uneven, the net impact is that there is over 17.5% more gas flowing through the Atmos Energy system today compared to 2015. As would be expected, such significant growth in customer count, reflecting both the strong population increase of Colorado and strong demand for natural gas services, translates into higher GHG emissions today than nine years ago. This growth means that, in order to reduce GHG emissions 4% by 2025 from a 2015 baseline and 22% by 2030, GHG emissions must actually be reduced by 17% and 33%, respectively, from the 2022 level of emissions.

Customer Participation – EE measures figure prominently in each of Atmos Energy's CHP portfolios. While EE is an excellent option to help lower GHG emissions, it should be noted that the installation of EE measures is done by customers on a voluntary basis. Atmos Energy plans to offer additional EE incentive levels and include targeted marketing efforts as part of its CHP, but even with additional incentive levels, there is no guarantee that customers will be willing to adopt and install the EE measures offered. Furthermore, there can be a lag between when a customer decides to purchase a high efficiency natural gas appliance or move forward with weatherization upgrades, when that measure is installed, and when GHG emission reductions start occurring. This lag will create the most challenges in 2025. Depending on the timing of the approval of Atmos Energy's CHP, there may be limited time to go into the field with enhanced EE marketing and higher incentives. This condensed schedule in turn would impact when EE measures are installed and when Atmos Energy can count the GHG emissions reductions from EE.

Availability of Recovered Methane – Recovered methane plays a significant role in each of the above-described portfolios. While there is an abundant supply of renewable natural gas ("RNG") available on existing markets outside of Colorado, there is limited information on the availability and pricing of RNG (referred to in the Clean Heat statute as "biomethane") that will meet the requirements to qualify as RM as defined in the statute and related rules. The assumptions in this report are derived from responses to a joint Request for Information ("RFI") issued earlier in 2023 by Atmos Energy and other Colorado gas distribution companies related to RNG that meets the definition of RM in the statute. Eight responses were received detailing the source, available timing, and in most cases amounts and costs for each response.

1. Atmos Energy Forecasts and Targets

The Company created a model to forecast customer counts and sales volumes for each year between 2024 and 2050. The model provides three scenarios, including a low case scenario and a high case scenario, as well as the base case scenario which falls in the middle. The Company calculated emissions targets based on the requisite 2015 GHG emissions baseline.

1.1. Baseline Energy and Customer Count Forecasts

The customer count forecasts are based on historical customer counts from October 2005 through September 2023, and used either demographic population growth projections for the Company's service areas or a simple regression-based forecasting used to extrapolate historical trends. The specific forecasting technique for each of the scenarios are described below:

- *High Case Scenario:* Customer counts in the high case scenario were developed by growing existing customer counts in each service area (by county) at the projected population growth rate as published by the Colorado State Demography Office each year starting in 2024 through 2050. This approach assumes that natural gas demand continues at levels that are proportional to current demand and grows as the local population grows, and gas supply is available to meet this demand.

- *Base Case Scenario:* The base case scenario was developed by assuming that customer counts between 2024 and 2050 would grow at half of the historical rate that existed between 2005 and 2023. This approach assumes that natural gas demand will be decreased by market and policy influences that exist in Colorado but are not defined specifically.

- *Low Case Scenario:* The low case scenario was developed by assuming that customer counts between 2024 and 2030 would grow at half of the historical rate that existed between 2005 and 2023, like the base case scenario. Furthermore, it assumes that customer count will not grow between 2030 and 2050. This approach assumes that natural gas demand will be decreased by market and policy influences that exist in Colorado significantly through 2030 and to the point where growth is suspended from 2030 through 2050.

Annual sales forecasts were developed by multiplying the forecasted customer counts (by customer type) as described above by the average annual consumption for each customer type. The average annual consumption was calculated using simple regression-based forecasting to extrapolate historical trends from historical data. The historical customer consumption data, disaggregated by customer class and service area between 2005 and 2023, were used to extrapolate future consumption trends using a regression model technique. As expected, residential trends project decreasing usage, which is supported as new homes will have similar or slightly lower gas usage compared to existing homes due to advancements in appliance efficiency, building codes, and technologies that increase EE. In addition, existing homes tend to use less energy over time as appliances are replaced with higher efficiency models, post-construction building envelope measures are implemented, and consumer behavior becomes more conservation minded. These types of measures are also supported by the Company's DSM program as well as a variety of federal rulemakings initiated by the US Department of Energy and US Environmental Protection Agency ("EPA"), each of which will increase the efficiency of gas -fueled appliances in forthcoming years.

The same forecast process was followed for commercial customers but resulted in an increasing trend. This trend is more difficult to explain as there is significant variation in the size, scale, and usage patterns of customers in this class.

1.2. Baseline Emissions

In accordance with Commission requirements,[11] Atmos Energy has estimated baseline GHG emissions using the most recent CHP Workbook published by the Colorado Air Pollution Control Division ("APCD") as a guide.[12] Baseline GHG emissions are the sum of:

- Estimated delivery system leaks of methane ("CH4") associated with the transportation and delivery of natural gas, from the city gate to the customer, converted to CO2e, as reported to EPA per 40 Code of Federal Regulations ("CFR") Part 98 Subpart W ("Subpart W"), and
- Estimated carbon dioxide ("CO2") emissions resulting from the combustion of natural gas delivered to Atmos Energy's customers, as reported to EPA per 40 CFR Part 98 Subpart NN ("Subpart NN"), excluding any sales customers that are otherwise subject to federal GHG reporting regulations and excluding all transportation customers.

Subpart W System Leaks

Subpart W system leak emissions are calculated per 40 CFR §98.233(q and r) and are comprised of:

- Leaks from pipeline mains and services,
- Leaks from transmission-distribution stations, and
- Leaks from metering-regulating stations.

Leaks from pipeline mains and services are estimated using Equation W-32A in 40 CFR §98.233(r), by applying the emission factors in Table W-7 to the total miles of distribution mains and number of distribution services in the system. Subpart W methodology stipulates a CH4 concentration in the natural gas of 100%, a leak duration of 8,760 hours per year ("hr/yr"), and a methane global warming potential ("GWP") of 25. The system miles of distribution mains and number of distribution services are as reported to the US Pipeline and Hazardous Materials Safety Administration ("PHMSA") annually.

Leaks from transmission-distribution stations are calculated per Equation 30 in 40 CFR §98.233(q), using five years of leak survey data. Subpart W methodology stipulates a CH4 concentration in the natural gas of 100%, a leak duration of 8,760 hr/yr, and a methane GWP of 25. Atmos Energy uses the resultant transmission-distribution station emissions and Equation 31 to determine a population emission factor for each meter/regulator run. The calculated population emission factor is then used in Equation 32B to estimate leaks from metering-regulating stations not at transmission-distribution stations.

The system leak GHG emissions presented in this CHP Workbook align with the Subpart W emissions reports submitted to EPA for calendar year 2015 and 2022. Atmos Energy recognizes that the EPA has proposed revisions to Subpart W that, when promulgated, may necessitate an adjustment to the

[11] Rule 4527.

[12] Attachments to the testimony of Stephanie Engwall, Atmos Energy

baseline GHG emissions in order to maintain a consistent methodology between baseline and projected emissions. Atmos Energy will adjust the baseline GHG emissions in the future as appropriate.

Subpart NN Customer End-Use

CO2 emissions associated with the combustion of natural gas by end-use customers are estimated using the CHP Workbook, which generally follows the methodology in 40 CFR §98.403. The CHP Workbook methodology estimates CO2 emissions based upon the amount of natural gas, in dekatherms ("Dth"), combusted by residential, commercial, and industrial sales customers, excluding large sales customers that would otherwise be subject to federal GHG reporting and excluding all transmission deliveries. The sales and transmission deliveries are as reported to EIA using Form EIA-176.

Consistent with Subpart NN, the CHP Workbook assumes 100% conversion of natural gas to CO2. The CHP Workbook applies an emission factor of 0.05307 MT CO2 per Dth of gas combusted ("MT CO2/Dth") to the total sales customer usage to determine total GHG emissions.

Weather and Customer Normalization

In accordance with APCD guidance, the baseline emissions utilize actual natural gas sales. Neither weather normalization nor customer normalization has been applied.

Additional Information

The statute and the CHP Workbook designate calendar year 2015 as the baseline year. Since 2015, Atmos Energy has experienced considerable growth, as shown in Table 2. Despite this growth, Subpart W emissions have decreased considerably due to a reduction in leaks found during surveys. However, Subpart W emissions from leaks make up a small fraction of total GHG emissions (i.e., 4% in 2015 and 3% in 2022).

Atmos Energy revised the CHP Workbook to include a column for calendar year 2022 GHG emissions, to provide perspective on the practical baseline to which the CHP portfolio emission reduction measures will be applied, once approved by the Commission. As discussed in more detail later in this CHP, Atmos Energy proposes that the Commission consider the practicality of achieving the emissions targets in a cost-effective manner while adhering to the RM limits in Rule 4728(d)(I)(A and B) and approve additional RM contribution for the Emissions Target portfolio, specifically for the 2030 target, as allowed by Rule 4728(d)(I)(C). [13]

[13] Note that the 25% recovered methane cap can be exceeded with justification.

Table 2. Summary of Baseline GHG Emissions and Associated Metrics

Metric	2015 Actual	2022 Actual	% Change
Sales Customer Usage (Dth)	11,989,623	14,089,724	+17.5%
Sales Customer Emissions (Subpart NN) (MT CO2e)	636,294	747,747	+17.5%
Miles of Mains	3,178	3,243	+2.0%
Number of Service Lines	97,881	110,702	+13.1%
Emissions from Leaks (Subpart W) (MT CO2e)	29,104	23,771	-18.3%
Total GHG Emissions (MT CO2e)	665,398	771,518	+15.9%

1.3. Emission Targets

The statute and corresponding Commission regulations establishes gas distribution utilities' GHG emission targets as:

- **2025 Target**: a "four percent reduction in GHG emissions in calendar year 2025 as compared to a 2015 baseline, of which not more than one percent (one-fourth of the emissions reductions required to meet the 2025 target) can be from recovered methane."
- **2030 Target**: a "22 percent reduction in GHG emissions in calendar year 2030 as compared to a 2015 baseline, of which not more than five percent (five-twenty seconds of the emission reductions required to meet the 2030 target) can be from recovered methane."

Rule 4728(d)(I)(C) further provides that a "gas utility's CHP may exceed the recovered methane caps [of the 2025 and 2030 targets] … if the Commission finds that the utility otherwise could not cost-effectively meet the clean heat targets and that exceeding the recovered methane caps is in the public interest."

Table 3 displays the Recovered Methane Allowance for each target year. As discussed in more detail below, Atmos Energy proposes that the Commission consider the practicality of achieving the emissions targets in a cost-effective manner while adhering to the RM limits in Rule 4728(d)(I)(A and B) and approve additional RM contribution for the Emissions Target portfolio, specifically for the 2030 target, as allowed by Rule 4728(d)(I)(C).

Table 3. Atmos Energy Emission Targets and Recovered Methane Limits

Description	Target Year	
	2025	2030
2015 Baseline GHG Emissions (MT CO2e)	665,398	
Percent Reduction from 2015 Baseline	4%	22%
Emissions Target (MT CO2e)	**638,782**	**519,010**
Recovered Methane Allowance[14] (MT CO2e)	6,654	33,270

The remainder of this document assumes the target for Atmos Energy CHP emissions to be 638,782 MT CO2e in 2025 and 519,010 MT CO2e in 2030, based on the 2015 baseline.

1.4. Cost Cap

Per § 40-3.2-108,(6)(a)(I), C.R.S., the Company calculated the prescribed maximum CHP annual spending as 2.5% of annual gas bills for all full-service customers. The company reported approximately $134M in revenue in 2022, resulting in a CHP annual spending cap of $3.4M.

2. CHP Portfolios

For all portfolios, Atmos Energy considered the following resource options and optimized to meet the objective of the portfolio, either from a cost or emissions perspective.

- The gas efficiency measures reflected in Atmos Energy's DSM Strategic Issues filing, Proceeding No. 23A-0216G, including incentives for Residential Existing Buildings, Residential New Construction, Commercial Existing Buildings, and Commercial New Construction, which include rebates on appliances (high-efficiency natural gas furnaces, tankless natural gas water heaters, smart thermostats) and weatherization upgrades (air sealing and insulation) for residential and small commercial customers, and a more customized approach for large commercial and industrial customers.
- Gas efficiency programs above and beyond the amounts already included in current approved plans, with some additional measures with lower cost-effectiveness (including early retirements of older gas equipment) and increased incentives for highly cost-effective measures (including high-efficiency gas equipment replacing older gas equipment) plus two pilot programs: 1) one for the use of newer direct-use natural gas heat pump technologies as a resource in Atmos Energy service territory and 2) a pilot program that targets the accelerated replacement of

[14] Rule 4728(d)(I)(A and B) limit RM to 25% of the emissions reduction, and Rule 4728(d)(I)(C) provides for an exceedance of the 25% with justification.

aging, inefficient manufactured homes with high-efficiency manufactured homes, which is expected to provide benefits particularly to income-qualified customers.

- Recovered methane.

2.1. Portfolio A: Least Cost

The CHP analysis determined that mature, high-efficiency natural gas appliances/equipment and weatherization is the least cost resource to meet the objective of this portfolio. However, achieving higher levels of penetration among Atmos Energy's customers of these established EE measures will require a ramp-up period as well as additional incentives to achieve these results in the marketplace. It is unlikely that the Company will be able to award the full $3.4M through EE incentives in the initial forecasted years. As such, this portfolio includes in each year the expected amount of EE measures the Company will be able to award in each year and devotes any remaining budget in that year to the purchase of RM.

For this portfolio, the resources include the following:

- The currently planned gas DSM programs resulting from the recent Strategic Issues filing;
- Gas efficiency programs above and beyond the amounts already included in current approved plans resulting from higher incentives and all potential EE measures identified in the market potential study, regardless of cost-effectiveness using the modified total resource cost ("MTRC");
- RM sufficient to meet the cost targets.

Figure 2 shows how each resource contributes to the GHG emission reduction goals.

Figure 2. Least Cost Portfolio Reductions from Business-as-Usual Forecast (BAU) by Clean Heat Resource

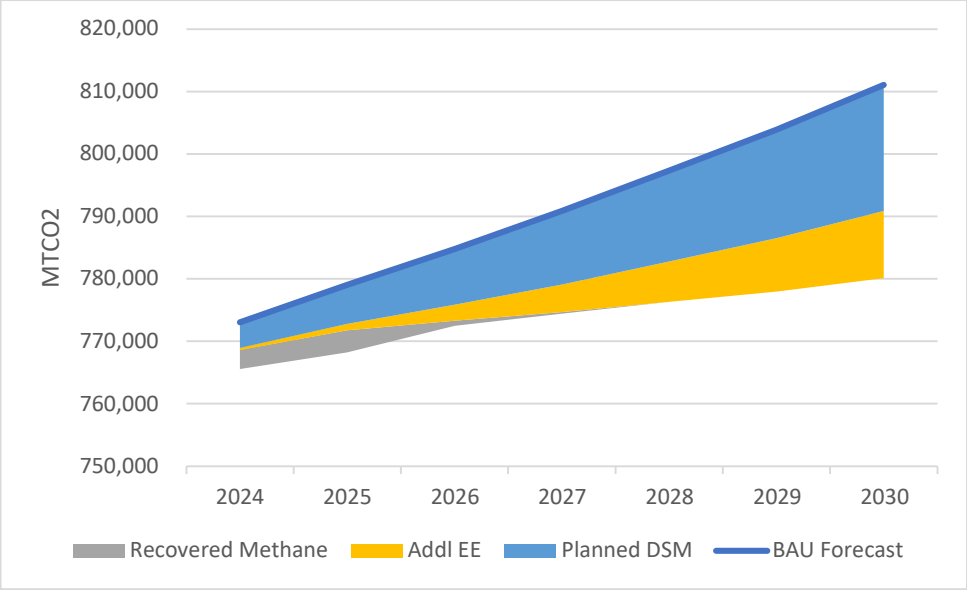


Table 4 shows the annual and projected GHG emissions and reduction in emissions from the baseline emission level.

Table 4. Least Cost Portfolio Annual GHG Emissions Reduction by Clean Heat Resource (MT CO2e)

Year	Planned DSM Program	Additional CHP EE Measures	Recovered Methane[15]	Total
2024	4,115	344	3,057	7,516
2025	6,280	1,041	3,498	10,819
2026	8,929	2,539	800	12,268
2027	11,748	4,446	222	16,416
2028	14,568	6,462	0	21,030
2029	17,387	8,549	0	25,936
2030	20,206	10,751	0	30,957

Table 5 shows the costs associated with each resource for 2024–2028.

[15] For RM in all Portfolios, the models used the recent RFI to derive a $/MT CO2e reduced from local RNG projects. This calculation enabled a budget and a volume of CO2e reductions associated with RM Credits to be developed for each Portfolio. A hypothetical Dth volume of RNG can be calculated from a $/MT CO2e using standard conversion factors. It should be noted that this is a theoretical exercise and does not necessarily reflect the actual volume of physical RNG that would need to be purchased to obtain the desired level of RM Credits. Methane content from individual projects will vary and impact the total number of RM Credits obtained and physical volume of RNG procured.

Table 5. Least Cost Portfolio Annual Costs for Clean Heat Resources ($Millions)

Year	Planned DSM Program	Additional CHP EE Measures (including pilots)	Recovered Methane	Total
2024	(costs not included in CHP)	$0.5	$2.9	$3.4
2025	--	$1.1	$2.3	$3.4
2026	--	$2.7	$0.7	$3.4
2027	--	$3.2	$0.2	$3.4
2028	--	$3.4	--	$3.4
Total	**--**	**$10.9**	**$6.1**	**$17.0**

The cost benefit-analysis assumes the costs as shown in Table 5 and the benefits in terms of the GHG emissions reductions shown in Table 4. Using the social cost of carbon at $68/MT CO2 for 2020 and applying Rule 4528, this portfolio results in a cost/benefit ratio of 1.33.

The proportion of spending associated with income-qualified customers for the planned DSM and additional EE in the Least Cost portfolio is 41%.

The Company anticipates that the proposed resources in this CHP portfolio will have no impact on the safety, reliability, and resilience of the Company's gas service.

2.1.1. Details by Clean Heat Resource Category

The annual and total costs for each clean heat resource for this portfolio are provided in Table 5.

The portfolios presented in this document, including the Least Cost Portfolio, do not incorporate any utility-owned projects addressed by § 40-3.2-108(8)(d), C.R.S., and do not incorporate any Clean Heat Resources that would affect the number of gas distribution jobs. To the extent applicable, the implementation of the Clean Heat Resources described herein would meet the requirements of labor standards outlined in § 40-3.2-105.5.

2.2. Portfolio B: Emissions Target

This portfolio is designed to assess the costs required to achieve the clean heat targets provided above. For this portfolio, the resources include the following:

- The currently planned gas DSM programs resulting from the recent Strategic Issues filing;
- Gas efficiency programs above and beyond the amounts already included in current approved plans resulting from additional incentives and all potential energy efficiency measures identified in the market potential study, regardless of cost-effectiveness (using the mTRC);

- Two pilot programs targeting the use of newer direct-use natural gas technology and program niche: one to test gas heat pump technologies as a resource in Atmos service territories and 2) a demonstration pilot program that targets manufactured housing for early replacement of manufactured homes with high efficiency manufactured homes; and
- Recovered methane sufficient to achieve the emissions targets.

Figure 3 shows how each resource contributes to the CO2e reduction goals.

Figure 3. Emissions Target Portfolio Reductions from Business As Usual Forecast (BAU) by Clean Heat Resource

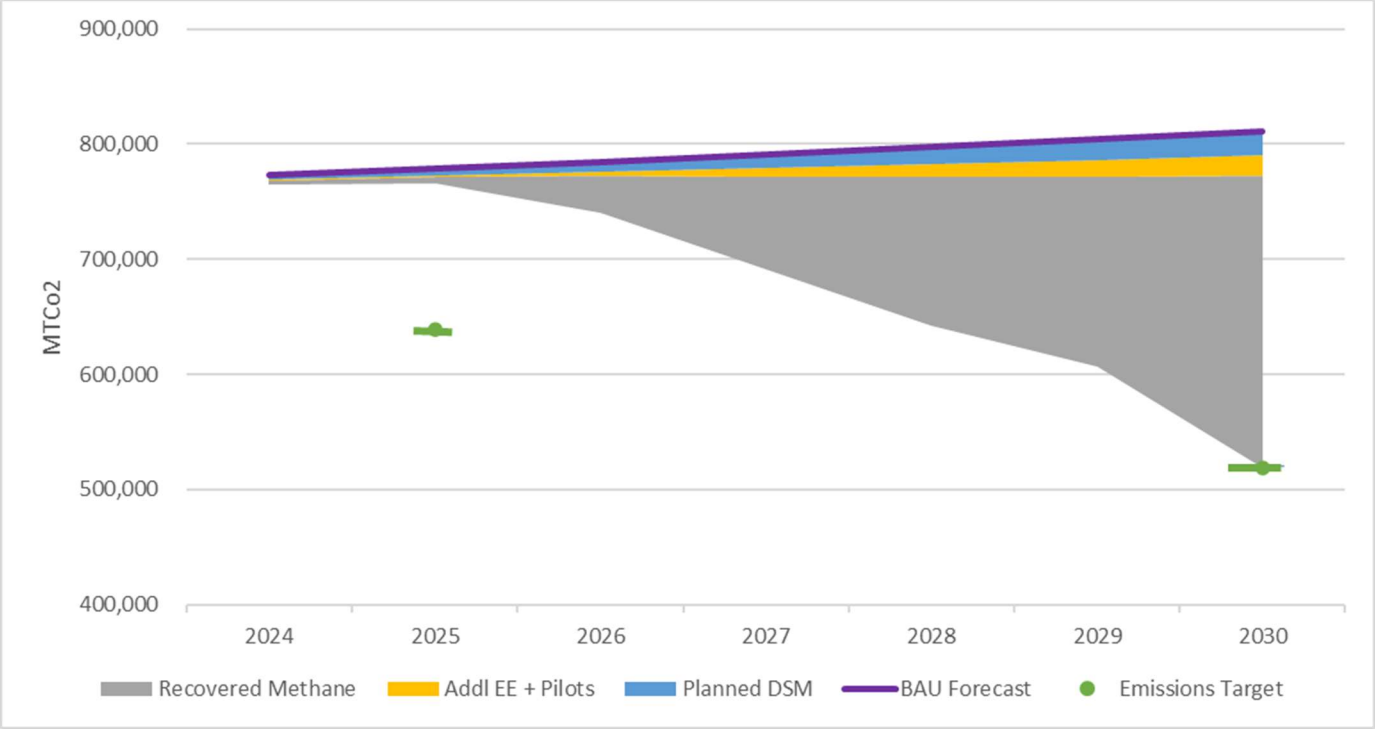


Table 6 shows the annual and projected GHG emissions and reduction in emissions from the baseline emission level.

Table 6. Emissions Target Portfolio Annual CO2 Emissions Reduction by Clean Heat Resource (MT CO2)

Year	Planned DSM Program	Additional CHP EE Measures	Gas Heat Pump Pilot	Manufactured Homes Replacement Pilot	Recovered Methane	Total
2024	4,115	463	--	--	3,608	8,186
2025	6,280	1,530	89	16	5,465	13,380
2026	8,929	3,415	267	48	31,199	43,859
2027	11,748	6,400	623	80	80,280	99,131
2028	14,568	9,715	1,157	80	129,802	155,322
2029	17,387	13,382	1,157	80	165,176	197,181
2030	20,206	17,354	1,157	80	253,291	292,088

Table 7Table shows the costs associated with each resource for 2024–2028.

Table 7. Emissions Target Annual Costs for Clean Heat Resources ($Millions)

Year	Planned DSM	Additional CHP EE Measures	Gas Heat Pump Pilot	Manufactured Homes Replacement Pilot	Recovered Methane	Total
2024	(costs not included in CHP)	$0.90	--	--	$3.42	$4.32
2025	--	$2.30	$1.08	$0.20	$3.59	$7.17
2026	--	$5.10	$2.16	$0.40	$27.31	$34.97
2027	--	$8.00	$4.32	$0.40	$76.21	$88.93
2028	--	$8.75	$6.48		$124.11	$139.34
Total	**--**	**$25.05**	**$14.04**	**$1.00**	**$234.65**	**$274.74**

The cost benefit-analysis assumes the costs as shown in 8, and the benefits in terms of the GHG emissions reductions shown in Table . Using the social cost of carbon at $68/MT CO2 for 2020 and applying Rule 4528, this portfolio results in a cost/benefit ratio of 0.17.

The proportion of spending for income-qualified customers for the planned and additional DSM in the Emissions Target portfolio is 34%.

The Company anticipates that the proposed resources in this CHP portfolio will have no impact on the safety, reliability, and resilience of the Company's gas service.

2.2.1. Details by Clean Heat Resource Category

The annual and total costs for each clean heat resource for this portfolio are provided in Table .

The portfolios presented in this document, including the Emissions Target Portfolio, do not incorporate any utility-owned projects addressed by § 40-3.2-108(8)(d), C.R.S., and do not incorporate any Clean Heat Resources that would affect the number of gas distribution jobs. To the extent applicable, the implementation of the Clean Heat Resources described herein would meet the requirements of labor standards outlined in § 40-3.2-105.5.

2.3. Portfolio C: Preferred Portfolio

This is Atmos Energy's preferred portfolio, designed to balance the goals of reducing GHG emissions with limiting the cost impact to our customers. For this portfolio, the resources include the following:

- The currently planned gas DSM programs resulting from the recent DSM Strategic Issues filing;
- Gas efficiency programs above and beyond the amounts already included in current approved plans that include higher incentives and expected adoption for furnaces, boilers, and water heaters;
- Two pilot programs targeting an emerging technology and program niche: 1) one to test gas heat pump technologies as a future resource in Atmos service territory and 2) a demonstration pilot program that targets an income qualified population living in manufactured housing for early replacement of manufactured homes with high efficiency manufactured homes; and
- Recovered methane.

Figure 4 shows how each resource contributes to the CO2e reduction goals.

Figure 4. Preferred Portfolio Reductions from Business As Usual Forecast (BAU) by Alternative

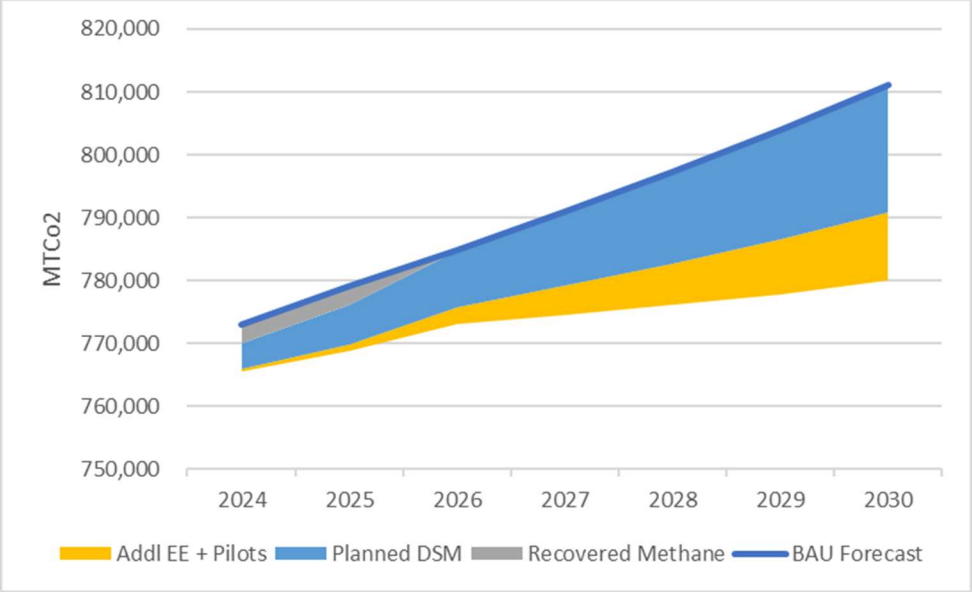


Table 8 shows the annual and projected GHG emissions and reduction in emissions from the baseline emission level.

Table 8. Preferred Portfolio Annual CO2 Emissions Reduction by Clean Heat Resource (MT CO2)

Year	Planned DSM	Additional CHP EE	Gas Heat Pump Pilot	Manufactured Homes Replacement Pilot	Recovered Methane	Total
2024	4,115	344	0	0	3,057	7,515
2025	6,280	1,041	9	16	2,989	10,334
2026	8,929	2,539	27	48	34	11,578
2027	11,748	4,446	44	80	0	16,319
2028	14,568	6,462	44	80	0	21,154
2029	17,387	8,549	44	80	0	26,060
2030	20,206	10,751	44	80	0	31,081

Table 9 shows the costs associated with each resource for 2024-2028.

Table 9. Preferred Portfolio Annual Costs for Clean Heat Resources ($Millions)

Year	Planned DSM	Additional CHP EE	Gas Heat Pump Pilot	Manufactured Homes Replacement Pilot	Recovered Methane	Total
2024	(costs not included in CHP)	$0.50	--	--	$2.90	$3.40
2025	--	$1.10	$0.14	$0.20	$1.97	$3.40
2026	--	$2.70	$0.27	$0.40	$0.03	$3.40
2027	--	$3.19	$0.27	$0.40		$3.86[16]
2028	--	$3.40				$3.40
Total		**$10.89**	**$0.68**	**$1.00**	**$4.93**	**$17.46**

The cost benefit-analysis assumes the costs as shown in Table , and the benefits in terms of the GHG emissions reductions shown in Table . Using the social cost of carbon at $68/MT CO2 for 2020 and applying Rule 4528, this portfolio results in a cost/benefit ratio of 1.37.

The proportion of spending associated with income-qualified customers for the planned and additional DSM Preferred Portfolio is 34%.

The Company anticipates that the proposed resources in this CHP portfolio will have no impact on the safety, reliability, and resilience of the Company's gas service.

2.3.1. Details by Clean Heat Resource Category

The annual and total costs for each clean heat resource for this portfolio are provided Table 11.

The portfolios presented in this document, including Atmos Energy's Preferred Portfolio, do not incorporate any utility-owned projects addressed by § 40-3.2-108(8)(d), C.R.S., and do not incorporate any Clean Heat Resources that would affect the number of gas distribution jobs. To the extent applicable, the implementation of the Clean Heat Resources described herein would meet the requirements of labor standards outlined in § 40-3.2-105.5.

[16] While the estimated budget for the Preferred Portfolio in 2027 exceeds the current estimate of the cost cap target by approximately 13%, Atmos Energy anticipates updating the cost cap and budget before that plan year so that the budget falls within the cap.

3. Pilot Projects

Atmos Energy is committed to reducing its GHG emissions while continuing to meet its customers' energy demands and achieving a lower-carbon economy, a goal that it shares with the state of Colorado. Doing so will necessarily involve innovation and exploration of the use of newer direct-use natural gas technologies. As part of its CHP, Atmos Energy is introducing innovative pilot projects that have the potential to meaningfully impact GHG emissions at scale. To explore that potential, the Company has designed smaller scale deployments of these resources so that the Company can evaluate the potential specific to its customers and service territory in Colorado. Atmos Energy's pilot projects are presented in more detail in the subsequent sections but include the use of a newer direct-use natural gas technology as well as testing a new program involving early retirement of manufactured homes to incentivize replacement with high efficiency homes. With Commission approval, Atmos Energy looks forward to working with stakeholders on deploying these pilot projects to study and maximize the potential benefit to the Company's Colorado customers. Atmos Energy also looks forward to working closely with its peers at the other gas providers in the state to share learnings and best practices from its pilot projects. In that way, gas customers across the state can benefit from Atmos Energy's experience with its pilot projects.

3.1. Gas Heat Pumps

Gas heat pumps (GHPs) operate in a similar fashion to other heat pump technologies by moving heat from a source to a sink. GHPs are currently available in the commercial and industrial sector and residential appliances have recently begun to be manufactured, with availability expected in calendar 2024. GHPs have the capability of space heating, space cooling, and water heating and are particularly well suited to colder and high-elevation climate applications, and in contrast to electric heat pumps, do not have challenges meeting the heating load in these climates.

Atmos Energy proposes the implementation of a residential GHP pilot for the following reasons:

- While GHPs are a proven and reliable technology, these technologies have not yet seen significant adoption in the commercial market due to low customer awareness and low availability of products. There are not yet products available for purchase in the residential sector.
- GHPs operate efficiently in cold climates without the need for backup systems.
- GHPs operate at efficiencies over 100%, even at below zero-degree Fahrenheit temperatures. This saves significant carbon compared to baseline boilers or furnaces.
- GHPs use ammonia as a refrigerant, which has significantly lower global warming potential compared to hydrofluorocarbons.
- GHPs do not require electric panel upgrades, making for an easier retrofit than electric heat pump technologies.
- GHPs can readily replace boilers; replacement is often impractical with electric heat pump technologies that are currently available.
- GHP technologies have the capability of utilizing RM, further lowering their carbon impact.

- The operational cost to consumers is lower for both gas and water heating compared to electric products.

Atmos Energy proposes operationalizing the pilot projects starting in 2025, when it is anticipated that multiple manufacturers will have residential products available. The pilot's proposed duration is three years, which will give Atmos Energy an opportunity to evaluate the results of the pilot and decide whether to extend, expand, or otherwise modify the program. Table 10. and Table outline the pilot program's proposed number of units installed, proposed incentives and program administration costs, and reduction in GHG achieved through the pilot on an annual basis for the Emissions Target and Preferred portfolios, respectively. Atmos Energy assumed a more aggressive program for the Emissions Target portfolio.

Table 10. Emissions Target Portfolio GHP Pilot Installations, Costs, and GHG Reduction

Year	Number of Units	Per Unit Incentives ($)	Total Incentives ($)	Program Admin ($)	Cumulative Energy Reduction (therms)	Cumulative Annual Emission Reduction (MT CO2)	Cumulative Lifetime GHG Reduction (MT CO2)
2025	50	$18,000	$900,000	$180,000	16,783	89	1,335
2026	100		$1,800,000	$360,000	50,350	267	4,004
2027	200		$3,600,000	$720,000	117,483	623	9,343
2028	300		$5,400,000	$1,080,000	218,183	1,157	17,352
2029	0	--	--	--	--	--	--
2030	0	--	--	--	--	--	--
Total	**650**	**$18,000**	**$11,700,000**	**$2,340,000**	**218,183**	**1,157**	**17,352**

Table 11. Preferred Portfolio GHP Pilot Installations, Costs, and GHG Reduction

Year	Number of Units	Per Unit Incentives ($)	Total Incentives ($)	Program Admin ($)	Cumulative Energy Reduction (therms)	Cumulative Annual Emission Reduction (MT CO2)	Cumulative Lifetime GHG Reduction (MT CO2)
2025	5	$18,000	$90,000	$45,000	1,678	9	133
2026	10		$180,000	$90,000	5,035	27	400
2027	10		$180,000	$90,000	8,392	44	667
2028	0	--	--	--	--	--	--
2029	0	--	--	--	--	--	--
2030	0	--	--	--	--	--	--
Total	**25**	**$18,000**	**$450,000**	**$225,000**	**8,392**	**44**	**667**

3.2. Manufactured Home Early Retirement

Atmos Energy's service territory in Colorado contains a significant number of customers who meet requirements for income-qualified programs. In particular, the Greeley area in Weld County has a large low-income population, with multiple large communities having a median income less than 80% of the state median income.[17] In addition, 7% of housing units in Weld County are manufactured homes, which provide one kind of affordable housing for Atmos Energy customers in these communities.[18] Many manufactured homes built before 1995 have minimal insulation, are not well sealed, and have inefficient appliances. Lower EE standards before 1995 for manufactured homes means that there are many families living in inefficient homes and as such are subject to higher-than-average energy burdens. Retrofitting manufactured homes can be very challenging due to the cost, the physical condition of many older manufactured homes, and the difficulty in accessing the spaces where retrofit work would be performed. Replacing the entire home is a more efficient, effective way to achieve all the upgrades associated with a highly efficient home that has significantly lower energy usage, resulting in lower monthly energy costs as well as lower GHG emissions.

Atmos Energy is proposing a pilot that would provide up to $30,000 in incentives per unit for replacement of existing, pre-1995 manufactured homes with a new model that meets the ENERGY STAR® Manufactured New Homes Version 3 requirements. In order to obtain an ENERGY STAR certification and be eligible for the pilot incentives, new manufactured homes must meet certain envelope, HVAC, water heating, lighting, and appliance efficiency thresholds. Upgrading to an ENERGY

[17] https://gis.dola.colorado.gov/disadvantaged_communities/

[18] https://www.census.gov/programs-surveys/acs

STAR manufactured home can save customers up to 30% on heating bills.[19] Atmos Energy would collaborate with owners/managers of manufactured home communities and mobile home parks to identify appropriate candidates for this pilot. It may be especially beneficial to try to replace manufactured homes when a home is vacant during a sale, so planning and engaging park owners early will allow them to inform residents about this opportunity.

Atmos Energy will use this pilot program as an opportunity to determine if it is feasible to scale this offering more broadly. Specifically, Atmos Energy will be investigating the level of gas savings associated with this measure. Atmos Energy would also be interested in talking with pilot participants to see how well the process worked and what improvements could be made.

Manufactured homes can last 50+ years and in many cases are used for 60–70 years or more. Accelerating the replacement of aging homes allows Atmos Energy to generate energy savings equal to the difference between the energy that an inefficient home would have used for the rest of its useful life had it not been replaced and what the new, more efficient unit uses. The analysis assumes the average remaining useful life is 15 years. Table outlines the pilot's proposed number of units installed, proposed incentives and administration costs, and reduction in GHG emissions achieved through the pilot on an annual basis.

Table 12. Manufactured Home Pilot Installations, Costs, and GHG Reduction

Year	Number of Units	Per Unit Incentives ($)	Total Incentives ($)	Program Admin ($)	Cumulative Energy Reduction (therms)	Cumulative Annual Emission Reduction (MT CO2)	Cumulative Lifetime GHG Reduction (MT CO2)
2025	5	$30,000	$150,000	$50,000	3,000	16	239
2026	10		$300,000	$100,000	9,000	48	478
2027	10		$300,000	$100,000	15,000	80	478
2028	--		--	--	15,000	80	
2029	--		--	--	15,000	80	
2030	--		--	--	15,000	80	
Total	**25**	**$30,000**	**$750,000**	**$250,000**	**15,000**	**80**	**1,195**

[19] https://www.crpud.net/ways-to-save/at-home/programs-for-new-homes/new-energy-star-manufactured-homes/

4. Cost Recovery

Atmos Energy is proposing recovery of the costs of implementing its CHP using a Clean Heat Plan Cost Recovery Rider ("CHP Rider"). Current recovery of Clean Heat costs, rather than deferring and accumulating costs for eventual recovery in a general rate case, will provide rate stability to customers from Clean Heat efforts, provide timely recovery to the utility and provide transparency to customers for Clean Heat Plan costs on their gas bills. Rate stability, regulatory support, and transparency are fundamental components of a cost recovery structure that can drive Clean Heat Plan activities in an affordable and clear manner for our customers.