American Gas Association Energy Analysis
Modeling the Economic Impacts of a Local Gas Moratorium in the Denver Metropolitan Area

(Updated with 2023 Datasets)

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Impacts to Residential and Commercial Energy Bills.

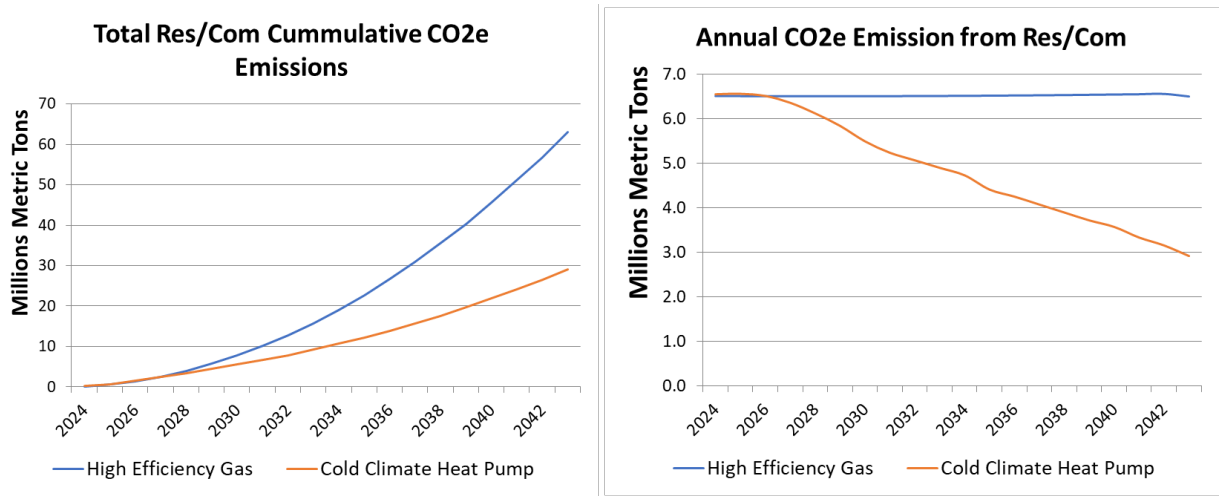
- In the Denver MSA, between 2024 and 2043, the gas moratorium would affect approximately 1.3 million homes and 58,000 commercial facilities. Additionally, AGA modeled the average cost of installing high-voltage service paneling in around 283,000 older homes built before the early 1960s, which would need these upgrades to electrify.
- According to AGA, the 20-year cost of owning the average home with high-efficiency natural gas equipment would be $16,380. The 20-year cost of owning an average home with electric equipment would be between $27,945 and $31,475, depending on whether the structure would require upgraded service paneling. Therefore, natural gas represents savings of 71% versus electricity for the energy needs of an average residential customer. Requiring electric equipment would increase customer costs by 92%.
- When equipment costs, installation costs, maintenance costs, and energy costs are annualized, the average home with natural gas would cost its customers an average of $819 per year while the average electrified home would cost between $1,397 and $1,573 per year. Hence, natural gas customers would save between $578 to $754 per year.
- This analysis presumes electrification would proceed gradually as more homes and commercial structures come online and existing appliances and equipment reach the end of their service lives. In 2043, electrification would increase net costs for residential customers by $730 million and for commercial customers by $242 million. From 2024 through 2043, residential customers' cumulative costs would increase by $6.2 billion and commercial customers' cumulative costs would increase by $2.3 billion for a regional total of $8.5 billion.

Impact Policy Will Have on Net Emission Reductions

- A primary driver for costs to consumers is the likelihood of extreme winter weather. Based on the last 10 years of local weather data (2010-2019), Denver experiences hourly temperatures at or below 35 degrees F 23.7% of the time, or the equivalent of over 86 full days yearly. This is a significant amount of time for customers to experience freezing temperatures outside. At below 15 degrees F, Denver experiences severe weather 3.1% of the time or for 11 days on average out of the full year.
- The mandated electrification would decrease CO2e emissions attributable to the Denver region by a cumulative 33.8 million metric tons between 2024 and 2043. This result reflects reduced direct use of natural gas and an increase in emissions from power generation, which would need to respond to additional load from electrification. This estimate includes all currently passed policies that would mandate all electricity within the state to come from renewables by 2040.

- Between 2024 and 2043, the continued use of natural gas while converting units to high-efficiency gas appliances would emit a total of 63.0 million metric tons of CO2e compared to an all-electric pathway which would emit 29.1 million metric tons of CO2e for a total savings of 54.0% over 20 years.
- AGA evaluated CO2e emissions using NREL's ReEDS model's long-term marginal rate and used the "Low Renewable Cost Scenario" to account for the accelerated use of renewable energy (2022 Cambium Database for the state of Colorado, located in the Western Electricity Coordinating Council Region). Natural gas emissions were assumed to equal 134 lbs. CO2e/MMBTU with no new decarbonization strategies throughout the 20-year period. Incorporating gas decarbonization strategies, such as integrating low-carbon fuels like renewable natural gas, would affect these results.
- Accounting for the emissions saved, the average cost per ton of CO2e saved would be $287 per metric ton of CO2e.
- Figure 1 displays the impact between 2024 and 2043 for the baseline and electrified scenarios.

Figure 1 – Total emissions from modeled households and businesses through 2043

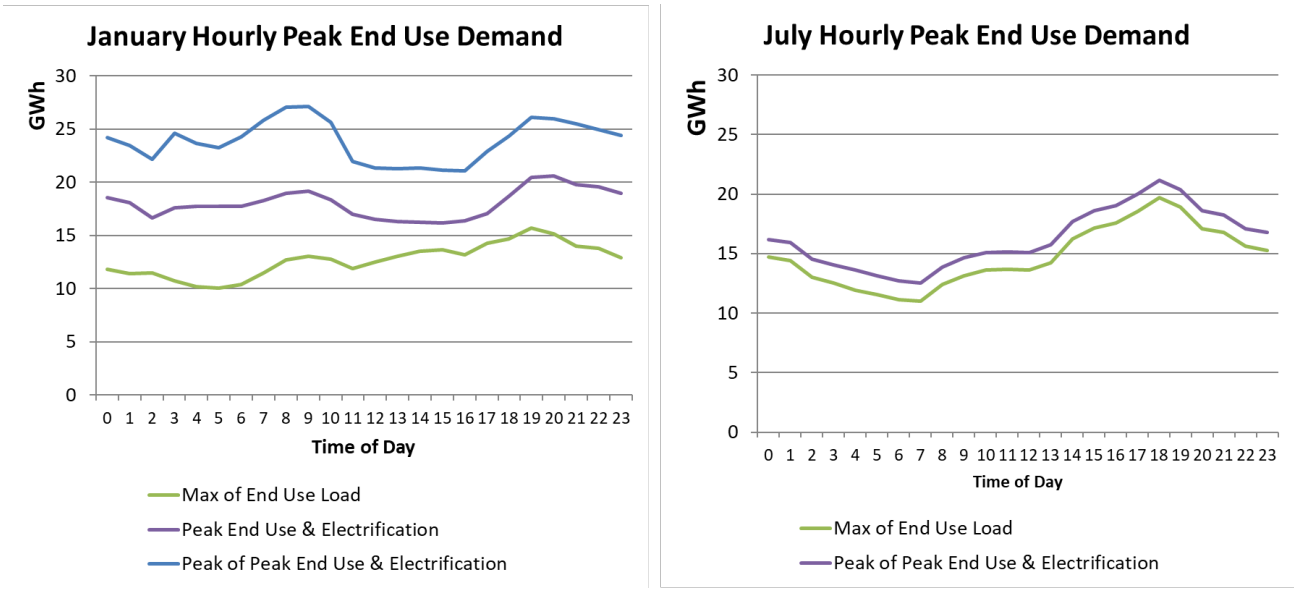


Source: AGA Modeling

Policy Impact on Summer and Winter Demand in 2043

- Figure 2 compares peak end-use demand in Colorado in the summer and the winter under the baseline and policy-mandated electrification scenarios in 2043. Both scenarios were built on the NREL's cambium database forecast for 2043 electricity demand which only relies on 2012 weather data. Peak electricity demand increases more severely under a 10-year "peak of peak" event. The implications of this type of strain on energy systems may have an impact on overall energy system resilience. Nonetheless, additional margins, lower appliance efficiencies, and a 30-year horizon for weather events can be factored in to account for a broader range of possibilities.

Figure 2 – Peak of peak January demand for Colorado in 2045 after the electrification policy



Source: AGA Modeling

This analysis is limited to the net costs and emissions impacts of mandated electrification for the Denver region. It does not attempt to determine the total costs of the electrification policy for all regions. Additional costs would include: (1.) the electric generation, transmission, and distribution costs associated with increased load on the whole of the Western Interconnection; (2.) the potential for gas utilities to raise rates on customers once the size of the customer base decreases; and (3.) and risks associated with changes in the reliability of the electrical grid and the overall resiliency of the Mountain and Pacific energy system

Notes on Updated Analysis (using 2022 data versus 2021)

- The first-year price data from the Energy Information Administration was originally 2020 monthly electricity and natural gas prices. The 2023 Dataset includes the most recent EIA 2022 prices, which in all categories increased yearly.
- Updated model used the 2022 EIA AEO forecast for regional electricity and natural gas prices through 2043.
- NREL updated the ReEds model from 2020 to 2022 and now includes a CO2e output for the long-term marginal rate for state electricity usage. This change includes new policies now in place at both the local and federal levels including any mandates to reach 100% renewables by 2040. Natural gas customers also represent an equivalent CO2e emissions estimate to match the one generated for electricity usage.