



Grounded in Reality: The Impacts of Electrification

Denver, Colorado

Introduction

As Colorado seeks to reduce greenhouse gas emissions, the continued use of natural gas, which provides efficient, safe, reliable, and affordable energy, will be essential to meeting this goal. Natural gas is already helping Colorado move to a cleaner energy future, providing reliable energy while driving down emissions and complementing renewables for more consistent grid reliability. The constant improvements through energy efficiency are also saving consumers money and protecting customer choice.

This analysis, prepared by the American Gas Association (AGA) and which derives from the forecasts developed by the National Renewable Energy Laboratory (NREL) and its ReEDS model of electric power markets¹, shows that the use of natural gas can support Colorado's economy by creating a sustainable path to a clean energy future while keeping energy costs low for consumers and businesses. Alternatively, employing an electrification policy in Colorado would do just the opposite, driving up costs for consumers, communities and businesses without significant environmental gains.

The Data Supports Natural Gas

AGA modeled the impact of a local gas moratorium in the Denver metropolitan area to understand the implications to consumers, the environment, and the local economy,² and the data shows just how devastating this would be in Colorado.

The analysis found that the annual average cost for a home with high-efficiency gas would be \$815 per year. An electrified home would be \$1,385 (without considering any upgrades to its electrical panel) over the same timeframe, a significant cost burden for homeowners with little environmental benefit. In older homes, the average costs increase to \$1,562 per year due to higher costs of equipment and electrical panel upgrades. All in, the all-electric home results in a 70-92 percent cost increase compared with a home with high-efficiency gas appliances.

In the commercial sector, businesses with high-efficiency gas would have average fuel costs of \$3,758 per year – compared to more than double for commercial buildings using electricity at \$8,183 per year. This represents a 118 percent increase in the cost of energy inputs for commercial structures.

The analysis assumed that electrification would proceed gradually over the next two decades as additional new buildings come online and existing buildings' heating equipment reaches end of life. By 2041, net costs for residential customers in the Denver region would be \$668 million higher, and

¹ see Methodology section at end of "Grounded in Reality" report

² Adams, Arapahoe, Broomfield, Clear Creek, Denver, Douglas, Elbert, Gilpin, Jefferson, and Park Counties

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commercial customers' costs would be \$249 million higher. For the 20-year window from 2022 to 2041, residential customers' aggregate increase in costs from a forced electrification policy would be \$6.9 billion, and commercial customers' increase in costs would be \$2.5 billion.

The higher costs of living and doing business would have significant and negative implications for the growth of the Denver region's economy. First, households facing higher energy costs would likely reduce their spending on consumer staples, which would negatively impact the service sector in the Denver region. Businesses that pay more for energy would pass their higher costs along to customers or be less competitive.

And if Denver took it a step further and enacted a local natural gas moratorium that would drive even more devastation to the city. By 2041 it would mean significantly fewer jobs, nearly 6,000 fewer, compared to a scenario where high-efficiency gas is available to consumers. The most severe impacts would be in the sectors related to education, healthcare, social assistance, food service and other personal services.

Consequently, the Denver region's economy would lose \$220 million in gross domestic product and \$289 million in labor income for households—significant impacts that steadily increases over time when more homes and commercial structures are pushed towards electrification.

And to what end? Despite all these costs to homeowners and businesses, the reduction in GHG emissions in the form of carbon dioxide (CO₂) from electrifying residential and commercial space and water heating would be minimal. The electrification scenario would decrease net CO₂ emissions attributable to the Denver region by merely 1.2 percent compared to high efficiency gas, a cumulative 735,000 metric tons between 2022 and 2041. The cost of this over a twenty-year period would be tremendous: \$9.5 billion (net) for customers.

To put a finer point on it – the cost of saving one metric ton of CO₂ in this scenario would cost \$12,875.³ For context, the current Biden administration prices carbon at approximately \$51 per metric ton⁴ under the Social Cost of Carbon (SCC) tool. While we expect the Biden administration to increase the SCC, it surely won't rise to the level of \$12,875/ton. The high costs of emissions reductions demonstrate that a forced electrification strategy is not the most economical way to reduce emissions nor the most environmentally beneficial.

In addition to the costs that home and business owners would shoulder, the societal costs of electrification are a critical piece of the data that need to be included in any discussion about a city or state's energy future. In 2018, AGA engaged a cross-functional team of experts at ICF to assist in the evaluation of policy-driven electrification of the U.S. residential sector⁵. The study reported regional results including a Rockies region that includes Colorado, Utah, Wyoming, and Montana and found that the electric capacity needed to support winter heating in the residential sector resulting from a widespread residential electrification policy could lead to significant increases in peak electric demand. On a nationwide basis, electrifying the entire residential sector by 2035 would increase

³ \$9.5 billion / 735,000 metric tons = \$12,875 per metric ton

⁴ https://www.whitehouse.gov/wp-content/uploads/2021/02/TechnicalSupportDocument_SocialCostofCarbonMethaneNitrousOxide.pdf
Implications of Policy-Driven Electrification

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peak electric system demand and could require the size of the entire U.S. power generation sector to almost double. These significant increases in electric power demand would require massive new investments in new electric generation, transmission, and distribution infrastructure. The total economy-wide increase in energy-related costs from policy-driven residential electrification could be significant. Nationwide, average household annual energy costs would increase by an average of 71 percent over the lifetime of the appliance equipment.

Methodology

This analysis, prepared with data from the American Gas Association (AGA), shows that the use of natural gas can support Colorado's economy by creating a sustainable path to a clean energy future, while keeping energy costs low for consumers and businesses. AGA's estimate of the new emissions from power generation derive from the forecasts developed by the NREL and its ReEDS model of electric power markets. Assumptions for this analysis come from the Low Renewable Cost Scenario and its long-term projections of marginal emissions from new sources of demand. It's worth noting, however, that the costs described in this analysis for phasing out natural gas use through the replacement of heat pumps and water heaters, are really the bare minimum. This analysis does not touch on the additional costs that would be necessary to improve electric infrastructure, resilience, and reliability – not to mention the rate increases borne by the remaining natural gas customers as other customers are driven towards electrification of these appliances.

Conclusion

AGA has offered up this perspective as Colorado state government leaders develop a Greenhouse Gas (GHG) Emissions Reductions Roadmap that pursues an all-electric future that includes a target to "increase building efficiency and electrification." As the Roadmap prioritizes lower emissions and greater energy efficiency, natural gas is already playing a key role in accomplishing both of those goals while supporting consumers and businesses.

The natural gas industry and Colorado's natural gas utilities are committed to a sensible approach that includes all energy sources, innovative low carbon technologies like renewable natural gas and energy efficiency, without sacrificing the reliable energy that Americans want, need and expect.

As Colorado considers how it should best transition to a lower-carbon future, several key questions must be answered, including:

- How does the cost of forced electrification compare with other strategies to reduce greenhouse gas emissions?
- What are the cost and infrastructure impacts to the electric grid?
- How is customer choice factored into the decision to implement these policies?
- Which approach is best for local homes and businesses?

This analysis shows that removing natural gas from the state's suite of energy options would have negative impacts on residents and the economy with only minimal greenhouse gas emissions reductions. Cleaner-burning natural gas provides affordable, reliable energy that saves money for consumers and businesses, supports jobs, and helps reduce emissions, facts that need to be part of a transparent conversation around the future of our nation's energy portfolio.