



Grounded in Reality

The Impacts of Electrification in Baltimore, Maryland
Executive Summary

Introduction

As Maryland 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 Baltimore support its clean energy future, providing reliable energy to homes and businesses, while also enabling the integration of renewable energy and helping maintain grid reliability. The consistent steps towards greater energy efficiency are also saving consumers money and protecting customer choice.

This analysis, prepared by the American Gas Association (AGA) using 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 Maryland'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 Maryland 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 Baltimore metropolitan area² to understand the implications to consumers, the environment, and the local economy. The data shows just how devastating this policy change would be in Maryland.

The analysis found that the annual average energy cost for a home with high-efficiency gas would be \$1,100 per year. The annual energy cost for an all-electric home, without the addition of any upgrades to the electrical panel, would be \$1,420 per year – a significant cost burden for homeowners. In older homes, the average cost increases to \$1,590 per year due to higher costs of equipment and electrical panel upgrades. All in, natural gas homes would save an average \$320 to \$500 a year, and the all-electric home would witness a 29-46 percent cost increase compared with a home with high-efficiency gas appliances. This increase in annual costs would be felt by the nearly sizable percent of Baltimore residents who have no financial cushion for an emergency expense and adds an unnecessary barrier

¹ See Methodology section at end of "Grounded in Reality" report.

² Baltimore-Columbia-Towson, MD MSA," which includes Baltimore County, Baltimore City, Anne Arundel County, Howard County, Harford County, Carroll County, and Queen Anne's County in Maryland.

to the economic recovery of all Americans who have had their savings drained by the COVID pandemic.³⁴

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 Baltimore region would be \$232 million higher, and commercial customers' costs would be \$39 million higher. For the 20-year window from 2022 to 2041, residential customers' aggregate increase in costs from a forced electrification policy would be \$2.3 billion, and commercial customers' increase in costs would be \$484 million.

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

And if Baltimore took it a step further and enacted a local natural gas moratorium, the action would drive the city's economy down even further. By 2041, there would be nearly 2,400 fewer jobs in a city with a nearly 9 percent unemployment rate, compared to a scenario where high-efficiency gas is available to consumers.⁵ The most severe impacts would be in the sectors related to finance and real estate, healthcare, and business, personal and food services.

And to what end? Despite all these costs to homeowners and businesses, and the damage to the economy, the end reduction in GHG emissions would be minimal. The electrification scenario would decrease Baltimore's net carbon dioxide (CO₂) contribution to the National GHG Inventory by a mere 0.2 percent (from 2019 levels) compared to high efficiency gas⁶ – a cumulative 14.9 million metric ton reduction between 2022 and 2041. The cost for this minimal reduction over a twenty-year period would be an astounding \$2.8 billion (net) for customers.

To put a finer point on it – the cost savings of one metric ton of CO₂ in this scenario would cost \$185 per metric ton. For context, the Biden administration currently prices carbon at approximately \$51 per metric ton under the Social Cost of Carbon (SCC) tool.⁷ The present value ("PV") of emissions saved would be \$421 million, while the PV of net costs would be \$1.5 billion for a benefit-cost ratio of 0.28 to one. The high cost of emissions reductions under this forced electrification strategy demonstrate that 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

³ <https://www.federalreserve.gov/publications/files/2018-report-economic-well-being-us-households-201905.pdf>

⁴ https://www.unitedforalice.org/Attachments/AllReports/2020ALICEReport_MD_FINAL.pdf

⁵ <https://msa.maryland.gov/msa/mdmanual/01glance/economy/html/unemployrates.html>

⁶ <https://www.epa.gov/ghgemissions/inventory-us-greenhouse-gas-emissions-and-sinks>

⁷ The SCC is currently open for public comment: <https://www.federalregister.gov/documents/2021/05/07/2021-09679/notice-of-availability-and-request-for-comment-on-technical-support-document-social-cost-of-carbon>

about a city or state's energy future. While electricity is only \$1 higher than the national average in Maryland, pushing an electrification agenda would require additional infrastructure and generation capacity, and that is a cost that customers would feel.

Additionally, if the state intends to meet the increased electricity demand from electrification with renewable resources, it threatens to leave supply reliant on intermittent energy sources. Natural gas is the largest source of electricity generation within the state and is allowing for the greater integration of renewables as Maryland endeavors to achieve its Renewable Portfolio Standard by 2030.⁸

On a nationwide basis, electrifying the entire residential sector by 2035 would increase 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. In Baltimore, the 20-year cost of owning an all-electric home would increase by an average of 46 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 Baltimore'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 state and local policymakers develop strategies to lower greenhouse gas (GHG) emissions without burdening vulnerable communities. Policy mandated electrification would deprive consumers and business of consumer choice, while leaving them to face the increased costs. Natural gas is playing a key role in reducing emissions and increasing energy efficiency, advancing a framework that promotes a healthy, sustainable and resilient future.

The natural gas industry and Maryland's natural gas utilities are committed to a sensible approach that includes all energy sources, innovative low carbon technologies like

⁸ <https://www.eia.gov/state/?sid=MD>

renewable natural gas and energy efficiency, without sacrificing the reliable energy that Americans want, need and expect.

As Maryland 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.