



Grounded in Reality

Modeling the Economic Impact of a Local Gas Moratorium in the Chicago Metropolitan Area

Key Facts

- This analysis uses the IMPLAN model to determine the impact of a moratorium on gas hookups for the Chicago metropolitan area ("the Chicago region")¹ in Illinois, Indiana, and Wisconsin. The moratorium would mandate installation of electric space and water heaters as well as the electrification of the other needs of residential and commercial customers.
- Based on inputs provided by the American Gas Association ("AGA"), only high-efficiency cold climate heat pumps, water heaters using heat pumps, and other similar electric appliances would be allowable in homes and commercial structures. The continued use of natural gas otherwise assumes only condensing space heating appliances and water heating appliances or other standard natural gas appliances present in these buildings.
- In the Chicago region between 2022 and 2041, approximately 1.5 million homes and 117,000 commercial structures would be affected by the gas moratorium. Additionally, AGA modeled the average cost of installing high-voltage service paneling in around 662,000 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 \$22,000. The 20-year cost of owning an average home with electric equipment would be between \$41,743 and \$45,273 depending on whether the structure would require upgraded service paneling. Therefore, natural gas represents a savings of between 47% and 51% versus electricity for the energy needs of an average residential customer. Electricity would represent an increase in customer costs of between 90% and 106%.
- 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 \$1,100 per year while the average electrified home would cost between \$2,087 and \$2,264 per year. Hence, natural gas customers would save between \$987 to \$1,164 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 2041, electrification would increase net costs for residential customers by \$1.4 billion and for commercial customers by \$903 million. From 2022 through 2041, residential customers' cumulative costs would increase by \$15.2 billion and commercial customers' cumulative costs would increase by \$9.9 billion for a regional total of \$25.1 billion.

¹ Formally defined as Cook, DeKalb, DuPage, Grundy, Kankakee, Kane, Kendall, Lake, McHenry, and Will Counties in Illinois; Jasper, Lake, Newton, and Porter Counties in Indiana; and Kenosha County in Wisconsin

- These higher costs of living and higher costs of doing business would have significant and negative impacts on the Chicago region's economy. Households facing higher energy costs would need to reduce their spending on other consumer staples, which affects the service sector in the Chicago region. Commercial businesses facing higher costs would have to pass their expenses onto customers or deal with their subsequent decrease in competitiveness in comparison to neighboring cities, states, and other regions.
- In 2041, the Chicago region would have 14,500 fewer jobs because of the local natural gas moratorium when compared to a scenario where homes and commercial structures instead utilize high-efficiency natural gas. These impacts would be distributed across the Chicago region's economy, though service sectors would be the hardest hit.
- The table shows the service sectors most affected by the gas moratorium and the resulting higher costs for residential and commercial customers in the Chicago region. Sectors most impacted include healthcare; finance, insurance, and real estate ("FIRE"); personal services; retail trade; accommodations and food services; and business services.

Service Sector	Jobs Impact (2041)
Healthcare	-3,778
FIRE	-2,398
Personal Services	-2,267
Retail Trade	-2,186
Accommodations and Food Services	-1,864
Business Services	-1,322
Professional Services	-1,082
Education	-829
Transportation	-788
Arts and Entertainment	-584
Wholesale Trade	-546
Communications	-292
Government	-68

- According to AGA calculations, the reduction in total carbon dioxide ("CO₂") emissions from electrifying residential and commercial building stock in the Chicago region would be minimal and come only at a price exceeding the social cost of carbon.
- The mandated electrification would decrease CO₂ emissions attributable to the Chicago region by a cumulative 34.4 million metric tons between 2022 and 2041. 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.

- The AGA estimate of the new emissions from power generation derive from forecasts first developed by the National Renewable Energy Laboratory (“NREL”) and its ReEDS model of power markets.² The assumptions for this analysis come from the “Low Renewable Cost Scenario” and its long-term projections of marginal emissions.³
- The NREL ReEDS model was used in this analysis to estimate hourly emissions and marginal costs for each natural gas-to-electricity conversion. The ReEDS model only provides marginal emissions for CO₂ and cannot provide a comparable rate for other air pollutants, including compounds such as methane, nitrogen oxides, and sulfur dioxide.
- The cost of these emissions reductions from the Chicago region would be higher than the federal government’s estimate of the social cost of carbon. Discounting the emissions and net costs by 5% yield an implied cost of \$732 per metric ton.⁴ Assuming one metric ton of CO₂ is worth \$51, the present value (“PV”) of emissions saved would be \$968 million while the PV of net costs would be \$13.9 billion for a benefit-cost ratio of 0.07 to 1.

This analysis is limited to the net costs and emissions impacts of mandated electrification for the Chicago 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 PJM Interconnection; (2.) the potential for gas utilities to increase 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 Midwest and Mid-Atlantic energy system.

² <https://www.nrel.gov/analysis/reeds/about-reeds.html>

³ According to the model documentation, this is the, “long-term marginal emissions rate of the generation induced by a persistent change in the region’s end-use load.”

⁴ With a 0% discount rate, the implied cost per ton is \$730