

FACT SHEET

Renewable Gas: Not a Climate-Aligned Solution for Buildings in Illinois

Electrification is the most viable option to fully decarbonize Illinois' buildings. Alternative fuels like renewable gas are more expensive, limited in supply, and can still cause significant environmental and health impacts. Illinois must plan to transition away from existing gas infrastructure as part of its clean energy strategy.

Biogas is only available in limited supply

“Biogas” is a gas alternative harvested from organic sources like landfills, animal manure, and wastewater treatment plants. **Gas industry analysis shows that biogas could only meet 6-12% of current gas demand** in Illinois' region by 2040.¹

“Does biogas have other impacts?”

Some biogas is captured from existing sources, like landfills, that would otherwise emit methane into the atmosphere. But more than half of the 2040 supply would have to come from newly produced sources, like crops grown for energy, that can actually increase emissions while displacing forests and causing other environmental impacts.¹



4% Captured biogas

Landfill, animal manure, food waste, wastewater

5% Produced biogas

Agricultural and forest residue, energy crops, municipal waste

91% Remaining demand

What does “alternative fuel” actually mean?

Alternatives proposed by the gas industry go by a variety of names and include two main groups:

Biogas is produced and harvested from organic sources. This biogas is then purified to pipeline-quality **biomethane** or “**renewable natural gas**”.

Synthetic gas, also known as **synthetic methane**, is manufactured by combining hydrogen with carbon oxides.

Blended hydrogen, is created by mixing gas with a small amount of hydrogen.



Synthetic gas is an inefficient option

Synthetic gas is created by producing hydrogen and blending it with carbon oxides. This process can theoretically be powered by renewable energy; however, renewables are more effectively used on the electric grid, where they can power efficient devices like heat pumps.

Blended hydrogen can similarly be powered (in part) by renewable energy, but existing gas pipelines can only safely carry a small percentage of hydrogen blend, limiting the carbon-saving potential of the fuel.

Synthetic gas requires more energy to produce the same amount of heat²

SYNTHETIC METHANE FURNACE



29.6 MWh energy input

Loss from production and leakage

Loss from gas equipment efficiency



15 MWh heat

ELECTRIC HEAT PUMP



5.8 MWh energy input

Loss from transmission and distribution

Gain from heat pump efficiency



15 MWh heat

Electrification lowers costs in more ways than one

Consumer costs

Building electrification is a more affordable option for meeting carbon goals. Biogas and synthetic gas will cost 4 times more than gas in 2040, while electricity costs are projected to decrease by 9% as Illinois continues to transition to renewable energy.⁶

Health impacts

Burning any alternative fuels in Illinois buildings will continue to pollute both indoor and outdoor air. Electrification would reduce the more than \$12.6 billion per year in health impacts that Illinois faces from burning fuels in buildings.⁷



HEAT PUMP POWERED ELECTRIC HEATING

\$44

per MWh of delivered heat³

BIOGAS POWERED HEATING

\$109

per MWh of delivered heat⁴

SYNTHETIC GAS POWERED HEATING

\$111

per MWh of delivered heat⁵

Alternative fuels do have important uses

Where do these fuels belong? Biogas and hydrogen should be reserved for applications in hard-to-electrify sectors:

- ✓ Fuels for shipping, aviation, and heavy-duty trucking
- ✓ Certain industrial processes like steel and fertilizer production
- ✓ Fuel cell backup for sensitive applications like semiconductor fabrication facilities

The time to electrify is now

Illinois cannot rely on running biogas and synthetic gas through aging pipelines to heat space and water and cook food. The supply of these alternative fuels is too limited to meet demand, and manufacturing and delivering them to consumers would be inefficient and costly.

Efficient, electric buildings are the best option for meeting climate, health, and affordability goals.



Take action

There are several steps policymakers can take now to ensure Illinois doesn't unduly invest in alternative fuels to decarbonize its buildings:

- ▶ **Specifically prioritize electrification and energy efficiency** in Illinois' building decarbonization planning.

- ▶ **Petition the Illinois Commerce Commission** to evaluate potential cost-effective and high-value applications of biogas and synthetic gas outside of the building sector.
- ▶ **Establish emissions standards, monitoring, and reporting** for any policy supporting the development of biogas and synthetic gas.

Learn more

At Scale, Renewable Natural Gas Systems Could be Climate Intensive, Environmental Research Letters, 2020, bit.ly/453clbO

A Pipe Dream or Climate Solution?, NRDC, 2020, on.nrdc.org/3JG5Sv8

We Need Hydrogen — But Not for Everything, RMI, 2022, bit.ly/3Pxb1JE

NOTES

1. RMI analysis; graph shows the average of high and low biogas potential for the East North Central Census region. American Gas Foundation, 2019, bit.ly/3PzTHUb; US Energy Information Administration (EIA), 2023, bit.ly/3Xur3pD
2. RMI analysis assuming 80% efficiency for methanation, electrolysis, and synthetic gas combustion and 270% heating season-weighted efficiency for heat pump.
3. RMI analysis assuming 270% heating season-weighted efficiency. US EIA, 2023, bit.ly/3XzJucu
4. RMI analysis assuming 80% combustion efficiency. American Council for an Energy-Efficient Economy, 2023, bit.ly/46rSS63
5. RMI analysis assuming 80% combustion efficiency. American Gas Foundation, 2019, bit.ly/3PzTHUb
6. American Council for an Energy-Efficient Economy, 2023, bit.ly/46rSS63; US EIA, 2023, bit.ly/3DRtppv
7. Data for 2017. RMI, 2021, bit.ly/3HKBRcC