American Gas FOUNDATION

STUDY

Opportunities for Reducing Greenhouse Gas Emissions Through Emerging Natural Gas Direct-Use Technologies

AN AMERICAN GAS FOUNDATION STUDY PREPARED BY ROLAND BERGER

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ABOUT THIE STUDY

This study verifies that the use of high-efficiency natural gas appliances is an affordable way to reduce emissions at a lower cost than electrification.

Improving the efficiency of natural gas direct-use technologies is still one of the lowest-cost ways to cut emissions from homes and businesses.

EMISSIONS SAVINGS PAY FOR THEMSELVES

20% REDUCTION

Adoption of high efficiency natural gas technologies can **reduce emissions by over 20%.**

$49 SAVED

High-efficiency residential gas furnaces result in a **net savings of $49/metric tons of CO_2-equivalent.**

$105 SAVED

Natural gas direct use efficiency improvements result in a **net savings of $105/metric tons of CO_2-equivalent** in the small commercial sector.

Several emerging natural gas technologies offer the potential for higher levels of emissions abatement.

By using natural gas during high-demand periods, dual-fuel systems can maintain heating performance while reducing reliance on the electric system.

Gas heat pumps offer a path for cold-climate emissions reductions.

They can provide better performance in colder climates, offer fuel flexibility, and improve reliability during power outages.

*Visit **gasfoundation.org** for more information.*

Blending low-carbon gas into existing natural gas supply adds **meaningful reductions at competitive cost** with other decarbonization measures.

Low-carbon gas, including renewable natural gas (RNG), can complement other emissions-reduction strategies, and its costs should be benchmarked against competing pathways rather than conventional gas.

29% ↓

In a modeled scenario assuming full adoption of high-efficiency gas equipment, combining efficient gas technologies with a **15% RNG** blend increases the potential emissions abatement to **29%** at a cost of **$62/metric tons of CO_2-equivalent.**

Gas efficiency can help protect consumers against price uncertainty.

In modeled scenarios where natural gas prices are assumed to increase, consumers place more value on energy savings and increase adoption of efficient natural gas direct use technologies.

Electric space and water heating pathways are more expensive.

When electric options are modeled alongside gas-efficiency measures, pathway-level abatement costs reach **$35–58/metric tons of CO_2-equivalent.** This elevated cost reflects the higher capital costs of electric heating equipment, particularly in colder regions, where higher heating loads and backup heating requirements increase installed costs.

Electrification pathways carry greater cost uncertainty under rising electricity prices.

Rising electricity prices reduce the modeled adoption of electric heat to **0%,** indicating strong consumer sensitivity to operating costs.

There is **no "one-size-fits-all" approach** to reducing emissions across residential and small commercial customers and geographies.

Customers place more value on energy savings and increase adoption of efficient natural gas direct use technologies

in modeled scenarios where natural gas prices are assumed to increase.

Customers continue to choose natural gas technologies

in regions where electricity carries a significant cost premium to natural gas, even with strong policy incentives.

Natural gas is likely to remain part of the long-term decarbonization landscape,

particularly for higher-intensity end uses such as space heating.