



# Comparative Analysis of Residential Heating Systems Study

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## Overview

Evaluating 14 different heating systems in 16 locations across the United States in both new and existing homes, this study measured each system's comparative equipment and installation cost, annual operating cost, carbon dioxide (CO<sub>2</sub>) emissions, and return on investment (ROI). The study did not consider equipment maintenance costs, or cash or tax rebates available to homeowners or construction professionals.

## Overall findings

The study revealed the superior performance of propane-fueled heating systems when comparing several factors, including faster ROI, lower CO<sub>2</sub> emissions, and efficacy as a backup system to air-source heat pumps (ASHPs) in moderate to warm climate zones.

## Southeast Region overview

The Southeastern United States is defined by year-round temperate weather and the outdoor living opportunities it affords. The region's residents rely heavily on their HVAC systems to deliver comfort and relief from intense Gulf moisture and humidity, which can also trigger violent and dangerous storms.

Legacy energy sources in the region, particularly electricity, present shortcomings to homeowners and construction professionals, including cost and reliability. During even a run-of-the-mill, moderate tropical storm, winds can knock down power lines, cutting off electricity and leaving households without basic space and water heating, space cooling, or refrigeration capabilities — sometimes for days.

In the wake of Hurricanes Andrew, Ivan, and Katrina, homeowners and construction professionals have found on-site propane to be a reliable, cost-efficient way to supplement or replace legacy energy sources. An underground propane tank can fuel a standby generator when the grid is down, delivering power for essential home services. The same tank can fuel a forced-air furnace or other standard heating equipment and the home's water heater, reducing energy costs compared to electricity — especially if the water heater is a tankless unit.

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## Southeast Region findings

Based on a comparative review of heating systems in both new and existing homes, the study found the following in the Southeast:

- Compared to a high-efficiency, electric ASHP — a common HVAC setup in Florida — a dual-fuel system using propane offers more fuel flexibility as energy prices fluctuate and the ability to avoid electric backup heating, which is the least efficient, most expensive, and most carbon-emitting mode of operation.
- For example, compared to a high-efficiency, electric ASHP, a 95% Annual Fuel Utilization Efficiency-rated propane-fueled furnace coupled with a standard air-conditioning system costs 12% less to install and expels 24% fewer CO<sub>2</sub> emissions.
- While electricity rates in some Gulf States remain slightly below the national average, kilowatt-hour costs in Florida and Texas — the region's most populated states — were 13% higher than the national average at the time of the study.

## Conclusion

While home heating is not top-of-mind for Gulf Coast residents or construction professionals, study findings indicate that propane is an exceptional alternative to the status quo for a variety of applications, especially given the reliability and affordability of legacy power sources.

Builders and homeowners who have benefited from propane-fueled standby power have discovered propane can also fuel amenities such as pools, spas, standalone space heating, fireplaces, water heaters, and outdoor cooking appliances.

Energy-conscious homeowners shopping for a home heating system almost always ask a construction professional: "Which system costs the least to operate and is the cheapest to install?" This study shows how that question warrants a careful answer, one that covers first costs as well as fuel costs.

For eco-conscious homeowners asking "Which system has the lowest carbon emissions footprint?" the surprising conclusion is that propane systems frequently have much lower CO<sub>2</sub> emissions compared to both ASHPs and alternative-fuel systems like ground-source heat pumps (GSHPs), which require electricity from the grid to operate.

Because residential heating systems are generally replaced every 12 to 18 years, construction professionals have ongoing opportunities to improve the energy and environmental performance of residential heating systems across the United States.

## About the author of the study

Newport Partners LLC, a market research firm based in Davidsonville, Md., conducted this study in 2008. Newport Partners specializes in the analysis of building systems' energy performance.

## For more information

Download the full heating analysis study at [buildwithpropane.com](http://buildwithpropane.com).

Access information on tax incentives and credits at [buildwithpropane.com/stimulus](http://buildwithpropane.com/stimulus).

For more information on the reliability, efficiency, and performance of propane furnaces and boilers, contact Tracy Burluson, PERC director of residential programs, at 202-452-8975 or [tracy.burluson@propanecouncil.org](mailto:tracy.burluson@propanecouncil.org).

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