

# RESIDENTIAL PROPANE APPLICATIONS: HIGH EFFICIENCY FURNACES

## FACT SHEET

*A residential high efficiency propane furnace delivers significant value and a new level of distinctive comfort to today's homeowners. They're affordable, efficient, economical to operate, and kind to the environment.*

A residential high efficiency propane furnace can provide exceptional space heating for both small floor plans and large custom homes. The furnace's PVC combustion air intake and sideways exhaust piping design allows the unit to be installed nearly anywhere in the house. And since all of the air used for combustion is taken directly from outdoors, they're more efficient and safer than traditional natural-draft furnaces. Plus, these furnaces are available in capacities ranging from 15 MBTUH up to 100+ MBTUH.

### PERFORMANCE

High-performance propane furnaces offer best-in-class efficiency — or AFUE — levels. In fact, many models deliver AFUE ratings of 98 percent. Equipped with a multi-stage burner system and a variable speed blower, these furnaces heat the home steadily

and comfortably. The heated air leaves the furnace at temperatures typically near 120 degrees Fahrenheit, significantly warmer than the delivery temperatures offered by electric heat pumps.

### ENERGY EFFICIENCY

A high efficiency propane furnace is rated anywhere between 90 and 98 percent efficient.<sup>1</sup> As the table below shows, propane furnaces have higher Energy Star efficiency level requirements than heating oil systems. Propane furnaces can also qualify for Energy Star's Most Efficient label; whereas heating oil furnaces are not eligible.

Over time, propane furnaces also maintain their efficiency better than systems like electric heat pumps.<sup>2</sup> High efficiency propane furnaces are also very economical to operate,



### APPLICATIONS FOR USE

- New Construction
- Replacements/Retrofits

### AT A GLANCE

- Provides space heating for any size floor plan.
- Electronic ignition sparks combustion for heat—no standing pilot light.
- Rated anywhere between 90 and 98 percent efficient.
- Qualifies for Energy Star's Most Efficient label.
- Has a smaller carbon footprint than most other systems.
- Qualifies for credits and incentives.

TABLE 1 EFFICIENCY RATINGS (AFUE)

TYPE OF FURNACE	ENERGY STAR MINIMUM AFUE REQUIREMENTS		ENERGY STAR "MOST EFFICIENT" MINIMUM AFUE REQUIREMENTS
			
	NORTHERN U.S. CLIMATES	SOUTHERN U.S. CLIMATES	
Propane/Nat Gas	95	90	97
Heating Oil	85	85	Not Eligible

1. Air-Conditioning, Heating, and Refrigeration Institute [AHRI] Directory of Certified Product Performance [ahridirectory.org/ahriDirectory/pages/home.aspx](http://ahridirectory.org/ahriDirectory/pages/home.aspx).

2. "Building America Performance Analysis Procedures for Existing Homes," US DOE Building America, 2006 [nrel.gov/docs/fy06osti/38238.pdf](http://nrel.gov/docs/fy06osti/38238.pdf).



and were found to be the most affordable to purchase and install compared with alternative systems, like electric heat pumps and ground source heat pumps (GSHPs), in a recent heating system analysis.<sup>3</sup>

Credits and incentives worth hundreds of dollars are available for high efficiency propane furnaces in both new construction and system replacements.

Visit [buildwithpropane.com](http://buildwithpropane.com) and search under “News and Incentives” to view current incentive opportunities.

**ENERGY CONSUMPTION & COSTS**

High efficiency propane furnaces use varying amounts of propane based on

1) climate severity and 2) home design. The estimates in TABLE 2 are for a typical new 2,400-square-foot home.

High efficiency propane furnaces provide energy, cost, and carbon savings in both new and existing homes. To show these savings, TABLE 3 compares a high efficiency propane furnace with alternative systems in a typical new 2,400-square-foot home. The propane furnace saves money and reduces CO<sub>2</sub> emissions.

To run your own analyses of different heating systems, PERC also offers the Energy Cost and Carbon Calculator with plug-in system selection and energy pricing at [buildwithpropane.com](http://buildwithpropane.com).

This calculator also estimates the performance drop-off in older systems, which lets you compare energy savings of a new propane furnace with an older heating system.

**ENVIRONMENTAL**

High efficiency propane furnaces have a smaller carbon footprint than most other systems. For example, electric heat pumps typically have CO<sub>2</sub> emissions which are 60 percent or greater than those of high efficiency propane furnaces.<sup>3</sup> This large difference in environmental performance is driven by the heat pump’s use of electric resistance back-up heating during times of cold ambient temperatures.

TABLE 2 REGIONAL CONSUMPTION OF PROPANE

REGION	PROPANE (GAL/YEAR)
Northeast	550
Mid-West	724
South	106
West	512

TABLE 3 PROPANE SAVINGS IN NEW & EXISTING HOMES

REGION	HEATING SYSTEM	ANNUAL ENERGY COSTS <sup>A</sup>	CO <sub>2</sub> EMISSIONS FROM HEATING
Northeast	<b>Propane Furnace ENERGY STAR Most Efficient</b>	<b>\$2,357</b>	<b>6.2 tons</b>
	Heating Oil Furnace Standard Efficiency	\$2,563	8.9 tons
Mid-West	<b>Propane Furnace ENERGY STAR Most Efficient</b>	<b>\$2,316</b>	<b>6.6 tons</b>
	Heating Oil Furnace Standard Efficiency	\$2,522	9.4 tons

A. Propane & Heating Oil Prices based on the average of weekly price updates for propane (\$2.37/gallon) and heating oil (\$3.15/gallon) from the U.S. Energy Information Administration for the 2014-2015 winter.

3. Performance Comparison of Residential Heating Systems: Energy, Economics, and Emissions, PERC, 2013 [buildwithpropane.com/Research-and-Training/Compare-Space-Heating-Systems](http://buildwithpropane.com/Research-and-Training/Compare-Space-Heating-Systems).

**FOR MORE INFORMATION**

To learn more about high efficiency propane furnaces and the Propane Education & Research Council, visit [buildwithpropane.com](http://buildwithpropane.com).

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*The Propane Education & Research Council was authorized by the U.S. Congress with the passage of Public Law 104-284, the Propane Education and Research Act (PERA), signed into law on October 11, 1996. The mission of the Propane Education & Research Council is to promote the safe, efficient use of odorized propane gas as a preferred energy source.*