

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 30 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.¹ 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.² 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 tax credits.

TABLE 1 AFUE RATINGS

TYPE OF FURNACE	ENERGY STAR MINIMUM AFUE REQUIREMENTS		ENERGY STAR "MOST EFFICIENT" MINIMUM AFUE REQUIREMENTS
	 NORTHERN U.S. CLIMATES	 SOUTHERN U.S. CLIMATES	 Most Efficient 2013 www.energystar.gov
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.

2. "Building America Performance Analysis Procedures for Existing Homes," US DOE Building America, 2006 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.³

Tax credits worth hundreds or thousands of dollars are available for high efficiency propane furnaces in both new construction and system replacements.

Visit this database of energy efficiency incentives to see what credits will apply: dsireusa.org.

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 CO₂ 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.

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 CO₂ emissions which are about double those of high efficiency propane furnaces.³ 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 ^{A,B}	CO ₂ EMISSIONS FROM HEATING
Northeast	Propane Furnace ENERGY STAR Most Efficient	\$2,831	6.2 tons
	Heating Oil Furnace Standard Efficiency	\$3,419	8.9 tons
Mid-West	Propane Furnace ENERGY STAR Most Efficient	\$2,022	6.5 tons
	Heating Oil Furnace Standard Efficiency	\$2,099	11.2 tons

Notes:

A. Propane & Heating Oil Prices based on US EIA Weekly Heating Oil and Propane Update, week of 1/14/2013.
New York: Propane: \$2.87/gallon. Heating oil: \$4.25/gallon. Michigan: Propane: \$2.06/gallon.
eia.gov/dnav/pet/pet_pri_wfr_a_EPLLP_A_PR_S_dpgal_w.htm.

B. Electricity prices taken from U.S. EIA Electric Power Monthly, data for October 2012. Michigan: 14.2 cents/kWh.
eia.gov/electricity/monthly/epm_table_grapher.cfm?t=epmt_5_6_a.

3. Performance Comparison of Residential Heating Systems: Energy, Economics, and Emissions, PERC, 2011 buildwithpropane.com/html/files/Heating_Systems_Analysis_2011.pdf.

FOR MORE INFORMATION

To learn more about high efficiency propane furnaces and the Propane Education & Research Council, visit buildwithpropane.com.

Propane Education & Research Council / 1140 Connecticut Ave. NW, Suite 1075 / Washington, DC 20036
P 202-452-8975 / F 202-452-9054 / propanecouncil.org

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.