EFFICIENCY

THE SITUATION

THE OPPORTUNITY

INSTALLATION

VENTING*

High efficiency propane furnaces need to be vented to the outdoors through a horizontal vent. This may differ from the existing heating oil or propane furnace that is being replaced.

A SINGLE, SIMPLE SOLUTION

HVAC installers can use concentric venting, which is a single pipe containing an inner exhaust vent and an outer intake vent for the air used in the propane furnace's combustion. This allows installers to make just one penetration through the building shell to the outdoors. And since it's typically plastic, rather than metal, the pipe stays cool-to-the-touch.

"OPEN" FLOOR PLAN FLEXIBILITY

If an old, vertical exhaust flue running upward through the house is no longer needed after a high efficiency propane furnace is installed, it can open up a home's floor plan. Building chases that hide exhaust flues can be reclaimed for extra floor space. And sealing these exhaust flues reduces air leakage and energy losses in the home.

CONDENSATE*

High efficiency furnaces gain part of their efficiency from extracting heat from hot combustion gasses. As these gasses cool, condensation can form and must be drained.

STRAIGHTFORWARD DRAINAGE

Furnace condensate can often be run to an existing drain in the vicinity of the furnace (such as an A/C condensate drain), drained to outdoors, or pumped to the building exterior using a condensate pump.

"ORPHANED" WATER HEATERS*

When a replacement high efficiency propane furnace is installed with sidewall venting, or if the old furnace shared an exhaust flue with a water heater, the water heater is considered "orphaned."

Orphaned water heaters must not be vented alone into a previously shared flue without ensuring that the flue meets appropriate NFPA requirements under its new condition and the water heater passes all required combustion safety tests. Re-lining of the exhaust flue may be necessary.

ADOPT YOUR BEST OPTION

If the electric or propane water heater is at least seven years old, consider replacing it as well.

Option 1: Install a new power-vented propane storage tank water heater (which can be side-wall vented) and then seal off the exhaust flue altogether.

Option 2: Install a propane-fueled tankless water heater, which offers best-in-class efficiency, very high hot water output rates, and floor space savings.

Option 3: Install an integrated "combi" system that uses a high efficiency propane tankless and a hydronic air handler to provide both water heating and space heating. The air handler supplies heat to the home by circulating air over a water-to-air heat exchanger heated by the tankless unit. Then, the furnace is no longer needed!

* In all cases, be sure to check with local building code requirements and equipment manufacturer specifications.

FOR MORE INFORMATION

To learn more about propane heating, building with propane, or the Propane Education & Research Council, visit **buildwithpropane.com**.

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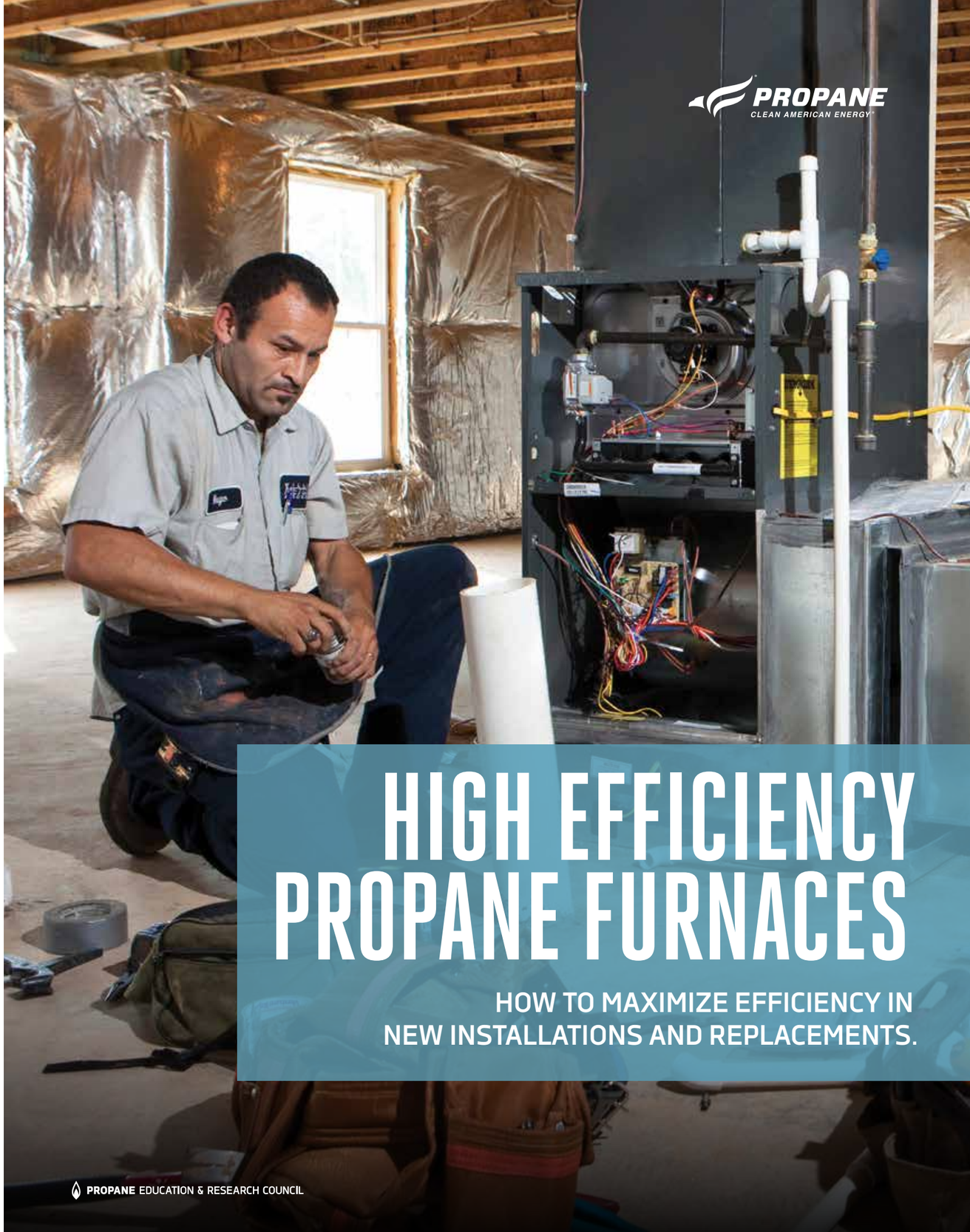
The Propane Education & Research Council was authorized by the U.S. Congress with the passage of Public Law 104-284, the Propane Education and Research Act (PERA), signed into law on October 11, 1996. The mission of the Propane Education & Research Council is to promote the safe, efficient use of odorized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



HIGH EFFICIENCY PROPANE FURNACES

HOW TO MAXIMIZE EFFICIENCY IN NEW INSTALLATIONS AND REPLACEMENTS.

PROPANE EDUCATION & RESEARCH COUNCIL

SEIZE THE OPPORTUNITY.

High efficiency propane furnaces (meaning an AFUE rating ≥ 90) are becoming more popular in U.S. homes because they deliver energy savings and comfort at an affordable first cost. In some regions, high efficiency furnaces are the most commonly installed system for new homes. The question of whether to select a high efficiency furnace — for either a new home or a system replacement — often comes down to first costs, resident comfort, and ease of installation. This guide explains these factors to builders, contractors, and homeowners so they can make the best choice for their projects.

THE SITUATION	THE OPPORTUNITY

APPLIANCE SELECTION

ELECTRIC HEAT PUMP COMPARISONS

Electric heat pumps can't compare. Electric heat pumps are often offered as a comparable option to propane furnaces; however there are key differences in costs and performance.

COST, COMFORT, CARBON

They're the three C's of a propane furnace. PERC analysis shows lower first costs (equipment + installation) for propane furnace systems (with central A/C) in new homes compared with standard heat pumps.[1]

The simple sidewall venting of a high efficiency propane furnace makes for an easy replacement of a heat pump, meaning heat pump owners can install a replacement propane furnace to take advantage of these benefits, too.

Propane furnaces provide warmer air and reduce greenhouse gas emissions by 22 percent when compared with electric heat pumps, particularly in areas where electricity is produced by coal-fired power plants.

1. Performance Comparison of Residential Heating Systems: Energy, Economics, and Emissions, PERC, 2011. This reported analyzed heating system total installed costs and found that a 95 AFUE propane system plus central air-conditioner and duct system had a slightly lower cost than a 78 AFUE propane furnace with central air-conditioner and ducts.

FURNACES

THE SITUATION	THE OPPORTUNITY

FURNACE EFFICIENCY

DEPRECIATING EFFICIENCY

New furnaces can still be as low as 78 AFUE — or 78 percent efficient. And without regular maintenance, they can lose up to 1 percent efficiency each year.[2]

YEARLY COST SAVINGS

Propane furnaces with ratings of 90 AFUE or higher can save homeowners roughly $300 to $800 per year, compared with current standard efficiency units.

SYSTEM DESIGN

OVER-SIZED FURNACES

Many existing homes have grossly over-sized heating oil or propane furnaces, resulting in heating systems which blast warm air — almost too quickly — when the thermostat calls for heat.

And older furnaces that vent upward through a metal exhaust flue can allow heated air to escape even when the furnace isn't operating.

APPROPRIATELY SIZED FURNACES

When a furnace is sized for the home's actual heating load, it offers greater comfort with what is often a smaller and less expensive furnace.

To do this, an HVAC contractor will perform a Heat Load Calculation, which takes into account changes in the home like additions, a finished basement, adding insulation to the attic, etc.

New furnaces should be sized based on the unit's output capacity, which is greater for high efficiency furnaces than for lower efficiency units.

FIRST COSTS
NEW CONSTRUCTION

STICKER SHOCK

Even though a propane furnace is 90 percent efficient and can lower utility bills and enhance comfort, the system's first cost is often the biggest decision-making factor.

FIRST COST IS A WASH

The total installed cost of a high efficiency furnace is often lower than, or equal to, less efficient (80 AFUE and lower) furnaces.[3]

A key cost-saving feature of the high efficiency propane furnace is its ability to use a less expensive plastic vent pipe that is typically simpler to install.

FIRST COSTS
REPLACEMENTS

BENEFITS VS. FIRST COST

In homes with older furnaces where a new high efficiency replacement system is an option, contractors and homeowners will weigh the high efficiency furnace's benefits versus its first cost.

ENERGY SAVINGS WIN OUT

Any jump in the installed cost of a high efficiency replacement furnace will typically be made up for in the first heating season based on energy savings. A new, appropriately sized furnace will help limit any cost increases too.

2. "Building America Performance Analysis Procedures for Existing Homes," U.S. Department of Energy Building America Program, May 2006.
3. Comparison of Residential Heating Systems: Energy, Economics, and Emissions, PERC, 2011. This reported analyzed heating system total installed costs and found that a 95 AFUE propane system plus central air-conditioner and duct system had a slightly lower cost than a 78 AFUE propane furnace with central air-conditioner and ducts.