



Heating Oil Conversion

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The current situation

For approximately a century, heating oil has served as a durable home-heating fuel — especially in the Northeast United States, a region characterized by older homes with legacy heating-oil systems and limited natural gas availability. Today, 7 percent of U.S. households use oil as their main heating fuel; within that group, approximately 78 percent live in the Northeast.

However, during the past few decades, heating oil has consistently lost market share at a rate of about 2 percent per year as propane, natural gas, and electricity have increased in popularity. Heating oil is no longer the energy of choice when considering new heating equipment. There are essentially four reasons for this shift:

- 1. Monthly costs and carbon emissions.** According to the DOE, when converting from an old, worn-out heating-oil system with an AFUE rating of 56 percent to a modern high-efficiency propane system with a rating of 97 percent, consumers will save more than \$40 for every \$100 spent on energy — and decrease carbon emissions by more than 2.5 tons annually.
- 2. Efficiency concerns.** Heating equipment fueled by propane or natural gas is available at higher efficiency ratings than what's commonly available for oil systems. In fact, federal tax credits for efficient heating systems set the bar for qualification at 90 percent annual fuel efficiency (AFUE) for oil systems, compared with 95 percent AFUE for propane furnaces. As this difference illustrates, oil furnaces simply can't deliver the efficiency that propane furnaces can, and heating oil equipment costs are generally higher.

Over time, oil heating systems tend to lose efficiency more rapidly. A recent U.S. Department of Energy (DOE) estimate of energy performance in older homes revealed that existing heating-oil boilers used for hydronic (radiator) heating can lose up to 30 percent efficiency in as few as 14 years. This decrease is significantly more than propane models in comparative homes.

- 3. Maintenance costs.** Heating-oil systems come with an oil tank that must be diligently maintained to reduce the risk of leaks and ground-water contamination.
- 4. Environmental risks.** Heating oil, if spilled, does not vaporize (evaporate) like some other petroleum fuels and can easily flow into water sources with environmental consequences. Heating-oil leaks and spills can be very costly to a homeowner. Many cleanups have been required in recent years.

Considerations for conversion

When it comes time to upgrade or replace heating-oil equipment, the first inclination is often to simply purchase new heating-oil equipment. While this may help reduce energy costs slightly, it will do little to reduce maintenance costs, long-term efficiency losses, carbon emissions, and environmental risks.

The cost of converting from heating oil to propane can be limited if the same style of heat delivery system (hydronic or forced air) is retained. The major expenses will be the safe removal of old heating equipment, the purchase of a new heating unit, and installation. This is also the best time to convert water heating to propane.

EXECUTIVE SUMMARY FACT SHEET

In addition, tax credits and other incentives offered through federal and state governments, local utilities, and propane organizations, can make the investment in a high-performance heating appliance, such as a propane appliance, very attractive. Propane heating appliances, for instance, are widely available with efficiency ratings of 95 percent to 98 percent and may be eligible for tax credits and incentives that offset the cost of upgrading to a high-efficiency unit. For the most-current tax credits and financial incentives for choosing a propane appliance, visit buildwithpropane.com/rebates.

Here's an overview of the pros and cons to popular heating-oil alternatives:

- **An electric furnace or boiler** will typically have an AFUE rating of nearly 100 percent. However, the high cost of electricity makes resistance-style heaters expensive to operate, while delivering less comfort. Plus, most of the electricity available to consumers is from coal-fired generation plants, which have a negative environmental impact.
- **Natural gas** is one choice for homeowners, but in the Northeast, especially, its relatively limited availability (and high cost to extend gas mains) can make it an expensive choice.
- **Ground-source heat pumps (GSHPs) and air-source heat pumps (ASHPs)** have become more popular lately. While offsetting high energy costs may make heat pumps seem like an economical solution, initial costs, difficult installation, and increased electricity use can result in hidden expenses and additional carbon emissions. Because of the high cost of installation, a GSHP can have a simple payback of more than 10 years, making it unattractive for homeowners looking to immediately reduce energy costs. Because ASHPs operate poorly in colder climates, their ROI can also be long.

The case for propane

Propane offers a host of key advantages:

- **Lower upfront and operating costs.** Based on a comparative review of heating systems in both new and existing homes in the Northeast, a high-efficiency propane furnace with an AFUE of 95 percent is less expensive to install as a replacement system than a standard-efficiency (78 percent AFUE) heating-oil furnace. Additionally, a high-efficiency propane furnace typically has lower operating costs.
- **Dependable on-site storage.** Like heating oil, propane is stored on-site, which provides security and independence for the occupant during times of power interruptions, natural disasters, emergencies, or prolonged weather events. Unlike heating oil, propane can be safely stored underground.
- **Easy integration.** A heating unit, whether a boiler or furnace, can easily be integrated into an existing oil heating delivery system. Fast and easy heating unit change-outs can significantly reduce the initial cost of conversions and leave existing heating-distribution systems intact.
- **Lower carbon emissions.** Propane is a much more environmentally responsible fuel than heating oil or electricity. A new high-efficiency propane furnace will emit 10,000 fewer pounds of carbon annually than a standard heating-oil furnace.
- **Increased versatility.** Propane is more versatile than heating oil. Propane is used for central and zone heating, water heating, indoor and outdoor cooking appliances, clothes dryers, fireplaces, patio and pool heating, lighting, and standby generators.
- **More domestic.** Because more than 95 percent of the propane used in the U.S. is produced in North America, it reduces our dependence on foreign oil.

To learn more

Register for our free AIA- and NAHB-approved course, "Retrofitting Homes from Heating Oil to Propane: Efficiency, Economic, and Environmental Benefits," at buildwithpropane.com/training.

For more information on the reliability, efficiency, and performance of propane furnaces and boilers, contact Tracy Burleson, director of residential programs at the Propane Education & Research Council, at 202-452-8975 or tracy.burleson@propanecouncil.org.



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