

New Hampshire Economic Conditions

January 2013

It's Cold Outside: Winter Heating in New Hampshire

According to ACS 2007-2011 estimates, there are 514,869 homes¹ in New Hampshire. More than half, 268,576 homes, are located in Hillsborough and Rockingham counties, the two most populated counties in the state. With the heating season upon us, there is a renewed focus on the types of fuel New Hampshire homeowners and renters use for heat and the costs of those fuels.

As of December 10, 2012, the New Hampshire Office of Energy and Planning reported the statewide average price for a gallon of home heating oil was \$3.76. The statewide average for a gallon of propane was \$3.12.²

¹ In this context, "homes" represent occupied housing units, whether occupant owned or rented. The US Census Bureau defines occupied housing units as a house, an apartment, a mobile home or trailer, a group of rooms, or a single room occupied as separate living quarters, or if vacant, intended for occupancy as separate living quarters.

² New Hampshire Office of Energy and Planning. <www.nh.gov/oep/>. Accessed December 11, 2012.

Fuel oil is the most common home heating fuel used in homes throughout the state. Utility gas use varies greatly by county and largely reflects which towns, if any, have that public utility available. Propane, or LP gas, consistently ranks third among all heating sources as the primary source of heat in the home. Combined into the "all other" category are homes heated by solar, coal, other fuel, or no heating fuel. Solar, as a primary source of heating a home, constitutes no more than one-tenth of one percent at its highest, in Carroll County. This only reflects the homes that heat primarily with solar.

Many homes in New Hampshire also use wood heat as a supplemental heating source. The number of homes using wood heat as a supplemental source is not known, as official statis-

tics measure a home's primary heating source only. Therefore, any home which burns oil or propane as their primary heating source and also burns wood is reported only under the primary fuel category of oil or propane.

Heating with Fuel Oil

Fuel oil is the most prevalent form of home heating fuel in New Hampshire. Statewide, 51 percent of homes have fuel oil as the primary heating source. New Hampshire varies greatly from the United States as a whole; nationwide, only 6.8 percent of homes have fuel oil as the primary source of heat.

With the exception of Hillsborough and Merrimack counties, at least 50 percent of New Hampshire homes in each county primarily heat with fuel oil. The highest concentration of homes heating with oil is in Coös

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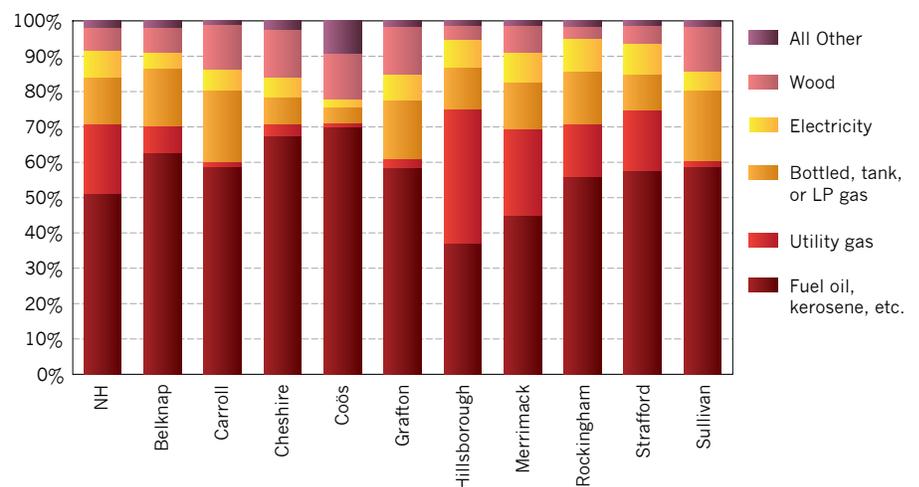
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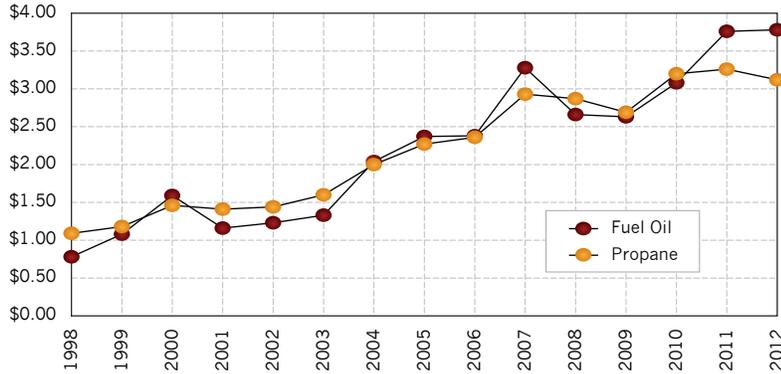
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Source of Fuel for Heating by State and County



Source: American Community Survey 2007-2011. Table B25040

Fuel Oil and Propane Average Prices, Statewide



Source: NH Office of Energy and Planning. Fuel Price Data.

County, 70.1 percent; however, Coös also has the fewest total number of housing units. Rockingham County has the third lowest percentage of homes heated with fuel oil, 55.9 percent, but due to the larger number of housing units in Rockingham County, there are still more homes heated with fuel oil in Rockingham than there are in any other New Hampshire county.

Fuel oil produces 138,690 BTU per gallon and costs \$27.10 per million BTU, using current prices.³ While prevalent in New Hampshire, fuel oil is one of the more expensive fuels available and, along with other factors, cost likely has an effect on its low use nationwide.

Heating with Gas

Nationwide, heating with gas is the most common primary home heating method. Across the country, 49.7 percent of homes have utility gas as the primary heating source, with an additional 5.2 percent that have propane or LP gas.⁴ In New Hampshire, 19.8 percent of homes are heated with utility gas, reflecting the low overall rate of accessibility to that public utility. An additional 13.2 percent of homes throughout the state have propane as the primary source of home heating fuel, which is more than twice the national share.

All New Hampshire cities and towns have residents that heat with propane. Conversely, the location of homes heated primarily with utility gas are almost exclusively along the I-93 and I-95 corridors, from the southern border of the state up to Concord, Boscaawen and Franklin, and along the coastline.

³ Unless otherwise stated, all BTU measurements are sourced from the U.S. Energy Information Administration. Heating Fuel Comparison Calculator <www.eia.gov/naic/experts/heatcalc.xls>. Accessed December 11, 2012. All costs per million BTU assume 100 percent burning efficiency. While this assumption provides a basis with which to compare fuel costs, actual costs will vary depending on the efficiency of an individual furnace.

⁴ U.S. Census Bureau. 2007-2011 American Community Survey 5-Year Estimates. Table B25040; Home Heating Fuel. United States. <factfinder2.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ACS_11_5YR_B25040&prodType=table>. Accessed December 13, 2012.

The Census Bureau publishes the American Community Survey (ACS) on an annual basis. Each year, 1-year estimates, 3-year estimates and 5-year estimates are released. The five year estimates are an average over the most recent five-year period, with the most recent release covering 2007-2011. The five-year dataset surveys enough households to release detailed information at a city and town level, which can not be done with the one and three year estimates as the sample sizes are not sizable enough.

The 2011 American Community Survey asked for occupied housing units, the type of fuel used most to heat the house, apartment, or mobile home. House heating fuel is categorized in ACS as follows:

Utility Gas: Gas piped through underground pipes from a central system

Bottled, Tank, or LP Gas: Liquid propane gas stored in bottles or tanks that are refilled or exchanged when empty

Electricity: Electricity generally supplied by means of above or underground electric power lines

Fuel Oil, Kerosene, etc.: Fuel oil, kerosene, gasoline, alcohol, and other combustible liquids

Coal or Coke: Usually distributed by truck

Wood: Includes purchased wood, wood cut by household members on their property or elsewhere, driftwood, sawmill or construction scraps, or the like

Solar Energy: Heat provided by sunlight that is collected, stored, and actively distributed to most of the rooms

Other Fuel: All other fuels not specified elsewhere

No Fuel Used: Housing units that do not use any fuel or have no heating equipment.

US Census Bureau, American Community Survey, 2011 Subject Definitions <www.census.gov/acs/www/Downloads/data_documentation/SubjectDefinitions/2011_ACSSubjectDefinitions.pdf>.

Hillsborough County has the highest prevalence of utility gas, with 37.8 percent of households reporting it as the primary heating source. In Hillsborough County, the percent of homes heating with utility gas is almost exactly equal to the percent heating with fuel oil.

Over the last 14 years, the price of propane has followed the price of fuel oil quite closely, with both increasing. In 2010, the price of propane started to drop, while fuel oil prices did not.

Utility gas, natural gas provided by a public utility, is a common source of heating fuel and has become less expensive and more available in recent years. The New Hampshire Office of Energy and Planning lists first tier natural gas as costing, on average,

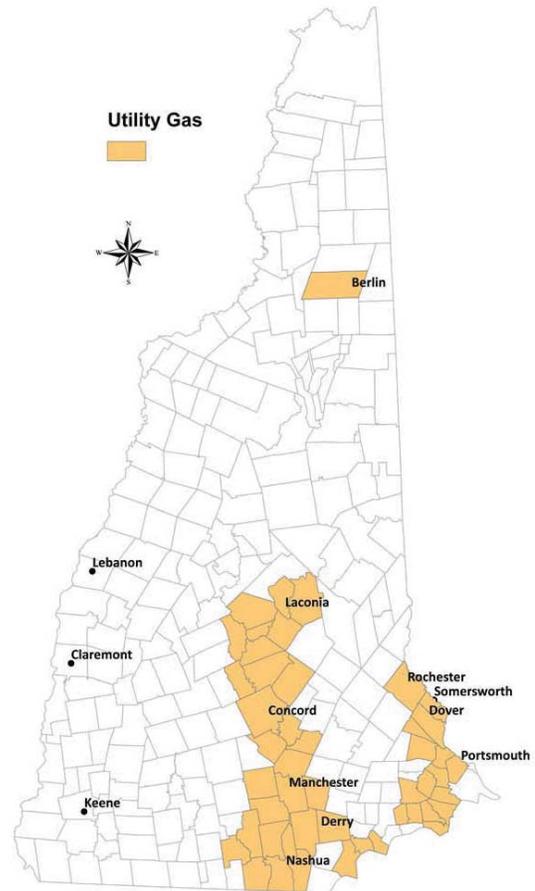
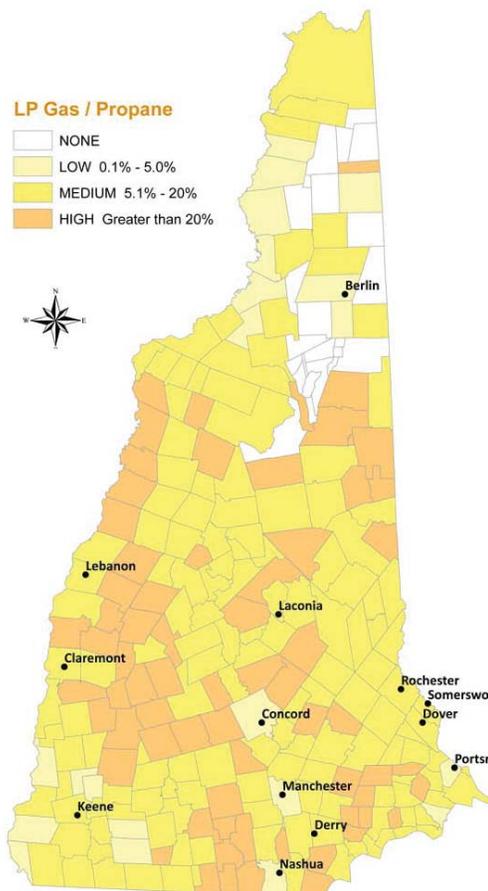
\$0.81 per therm as of December 10, 2012. According to the U.S. Energy Information Administration, it provides 100,000 BTU per therm, for a cost per million BTU of \$8.10. However, the \$8.10 per million BTU is only for the cost of the gas. Public utilities include an additional delivery and/or transmission charge as well as other fees that increase the final cost. These costs vary by utility provider and are not accounted for in the above pricing.

The average cost of propane was \$3.12 per gallon as of December 10, 2012. Per gallon, it provides 91,333 BTU, with cost per million BTU of \$34.10, higher than fuel oil, despite a lower price per gallon.

Natural gas has the lowest cost per million BTU of any of the fuels examined

(excluding natural gas billing costs, such as utility transmission fees). Fuel oil and propane are the most expensive. Natural gas, while offering low costs, is dependent on the availability of public utilities, which involve a network of underground pipes to supply individual homes. About 21 percent of New Hampshire municipalities are served by a natural gas utility.⁵ In order for a home to be heated with natural gas, it not only needs to be located in a city or town that is served by utility gas, but the house itself needs to be within the service area. Not every home in each community with utility gas service is within the service area of the underground pipes. Those homes must use another heating fuel.

⁵ Based on service area by town information from The Public Utilities Commission. <www.puc.nh.gov/gas-steam/communitieservedmap.pdf>.



Heating with Wood

There are about 33,500 households in New Hampshire that heat primarily with wood, accounting for 6.5 percent of all homes in the state. Though the rate of burning wood as the primary household fuel is similar among the New Hampshire counties, differences can be seen among the cities and towns.

In some communities, most noticeably those in Coös, Grafton, and Cheshire counties, up to 30 percent of homes are heated primarily with wood.

There are two common methods of wood fuel used: cordwood and wood pellets. Cordwood refers to cut and

split firewood. A “cord” is a cubic foot measurement of whole split wood and is defined by the state. Measuring BTU of cordwood presents two challenges: first, “green” wood, or wood that has been freshly split and has a high water content, burns less efficiently than “seasoned” or “dry” wood, which has been split and dried for roughly six months. Second, each species of wood burns at a slightly different BTU per cord. The U.S. Energy Information Administration estimates one cord of wood produces between 20 and 22 million BTU, while one ton of wood pellets produces 16.5 million BTU. Wood pellets are made of compressed sawdust, often the by-product of a sawmill or other wood processing operation. Because wood pellets are compressed, they provide a consistent BTU measurement. Wood pellets are sold by weight.

The New Hampshire Office of Energy and Planning reported the average price of one ton of wood pellets the week of December 3, 2012 was \$234.07.⁶ Current prices result in wood pellets costing \$14.10 per million BTU. Average prices for cordwood are not published.

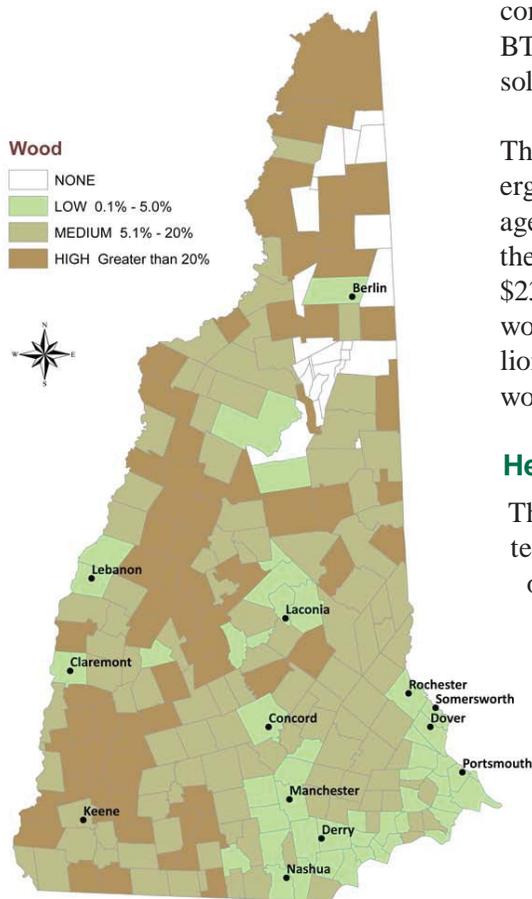
Heating with Coal

Throughout New Hampshire, one-tenth of one percent, or 611 homes out of 514,000, heat primarily with coal. Like other sources of heat, the percent varies by county. Grafton, Rockingham and Sullivan Counties have the highest percentages of burning coal, though in these counties it is no more than three-tenths of one percent.

There is a contradiction between the stigma associated with coal and the cost-effectiveness of burning coal. The U.S. Energy Information Administration online calculator reports one short ton of anthracite coal produces 25 million BTU of energy. In comparison, one gallon of home heating oil produces 138,690 BTU of power. For example, a 200 gallon tank would produce just under 28 million BTU. In addition, coal does not burn as quickly as heating oil, so consumers use less coal through the heating season, resulting in lower heating costs. The New Hampshire Office of Energy and Planning does not release the average price of a short ton of coal, however, a recent newspaper article reported pricing around \$327 per ton.⁷ Using that price estimate, coal costs \$13.00 per million BTU, while home heating oil costs \$27.10 per million BTU — more than double the per million BTU cost than coal (at current prices).

Anthracite coal is the type of coal used for residential heating, and is different from bituminous coal, the type used in power plants for generation of electricity. Anthracite coal is the highest grade of coal, contains the most carbon, the least moisture, and is also the rarest, preventing its use in coal-fired power plants due largely to supply issues.⁸

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⁶ New Hampshire Office of Energy and Planning. <www.nh.gov/oep/>. Accessed December 11, 2012.

⁷ “Coal is Still King for Some as Upper Valley Homeowners Praise Oil Alternative.” Valley News. December 8, 2012. <www.vnews.com/home/3214479-95/coal-oil-anthracite-burning/>. Accessed December 18, 2012.

⁸ Geology.com “What is Coal?” <geology.com/rocks/coal.shtml/>. Accessed December 13, 2012.