



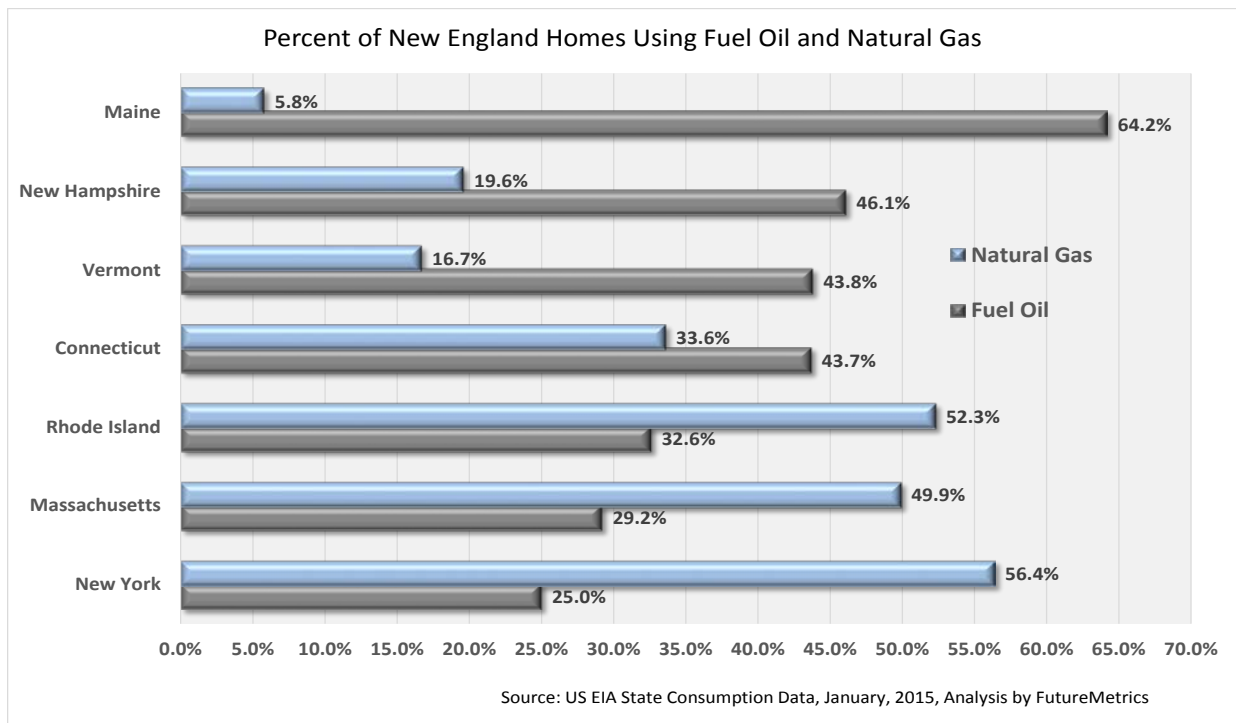
Why Converting from Heating Oil Boilers to Wood Pellet Boilers should be done BEFORE Upgrading Home Insulation

The conventional wisdom is that upgrading the insulation in homes is the most cost effective pathway to reducing household heating costs. That wisdom is flawed in several ways. This short white paper will explain why. The principal points are:

- While tightening homes will lower fuel usage, it will not protect homeowner from the impacts of higher heating oil costs. If heating oil costs rise enough all of the savings from insulation are eliminated.
- Of every dollar spent on heating oil, about 78% of that dollar leaves the regional economy. Home insulation improvement only mitigates this drainage and, if heating oil prices rise from their current levels, the drain will return to or exceed the levels prior to the insulation program. Every dollar spent on regionally made pellets stays in the regional economy. The effects of keeping money circulating in the economy is increased commerce and job growth.
- The production and refining of heating oil benefits foreign economies and distant oil refineries. The production and refining of non-sawlog quality sustainable wood fiber benefits regional forestry workers and landowners and creates logging, trucking, and pellet plant jobs.

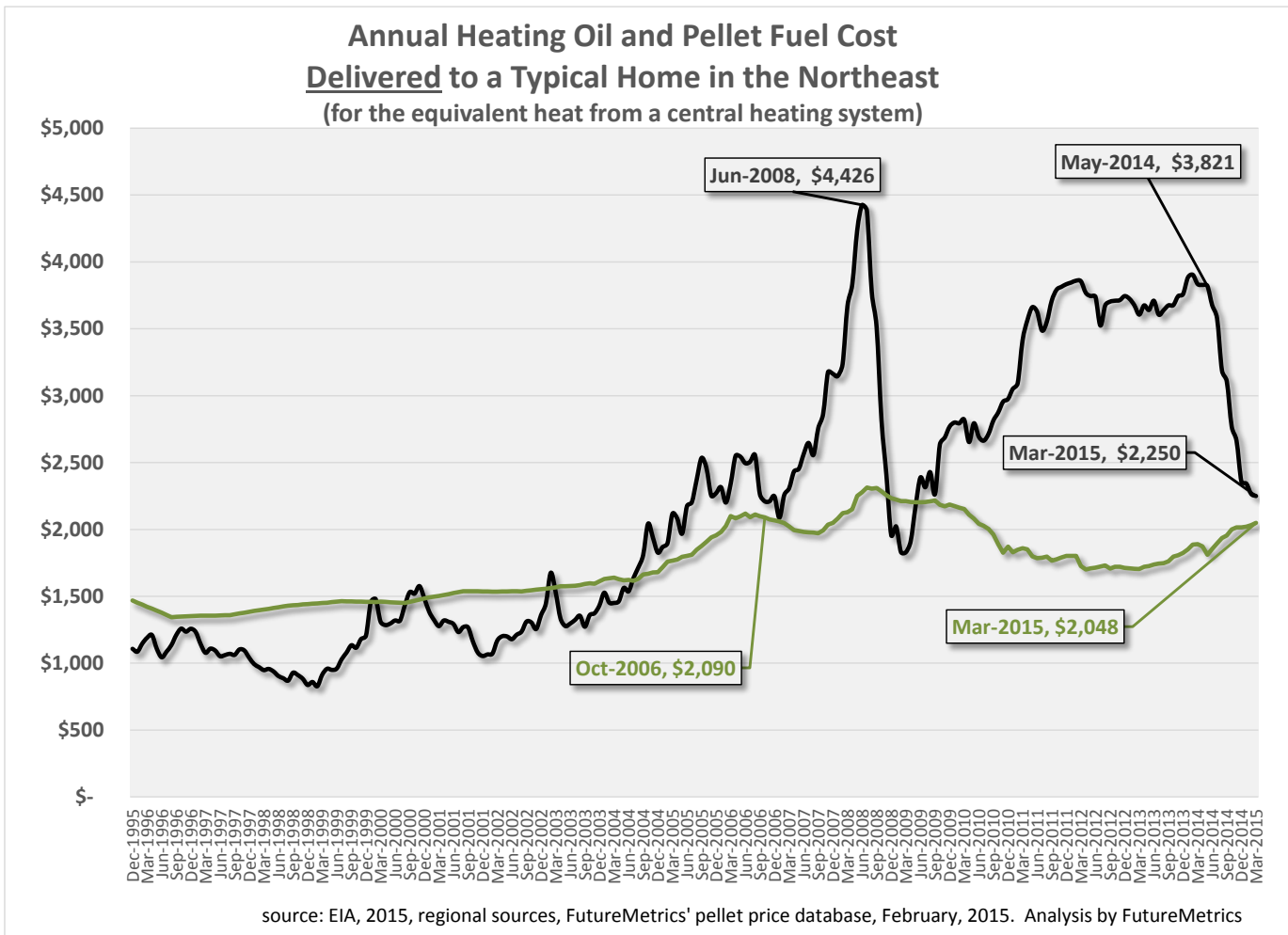
These points are discussed in more detail below.

The northeast states are the nation's most dependent states on heating oil. The northern New England states also have very low pipeline natural gas penetration. Conversion to natural gas is not an option for a majority of New England homeowners.





Improving the insulation of homes will lower the home’s demand for heating oil. But it does not protect the homeowner from increasing heating oil costs. Heating oil prices have varied dramatically over the past 20 years. Wood pellet prices however have been relatively stable. The chart below shows the historical cost to heat a home that uses 1000 gallons of heating oil over the last 20 years (to March 2015). It also shows the cost to heat the same home with the equivalent amount of wood pellet fuel used in a modern automated wood pellet boiler system¹.



Until this recent fall in oil prices and slight rise in pellet fuel prices, a home that used 1000 gallons per year of heating oil that converted from heating oil to wood pellet fueled boilers cut their heating bills in half putting almost \$2000 extra dollars per year in those homeowners pockets.

What happens to the homeowner’s heating bill if they upgrade their home’s insulation? They experience a drop in the number of gallons needed, and at current oil prices they save money. For example, if the insulation project results in a 30% drop in heat losses, a home that uses 1000 gallons of heating oil per year will use 700 gallons per year.

¹ See Maine Energy Systems for examples: www.MaineEnergySystems.com

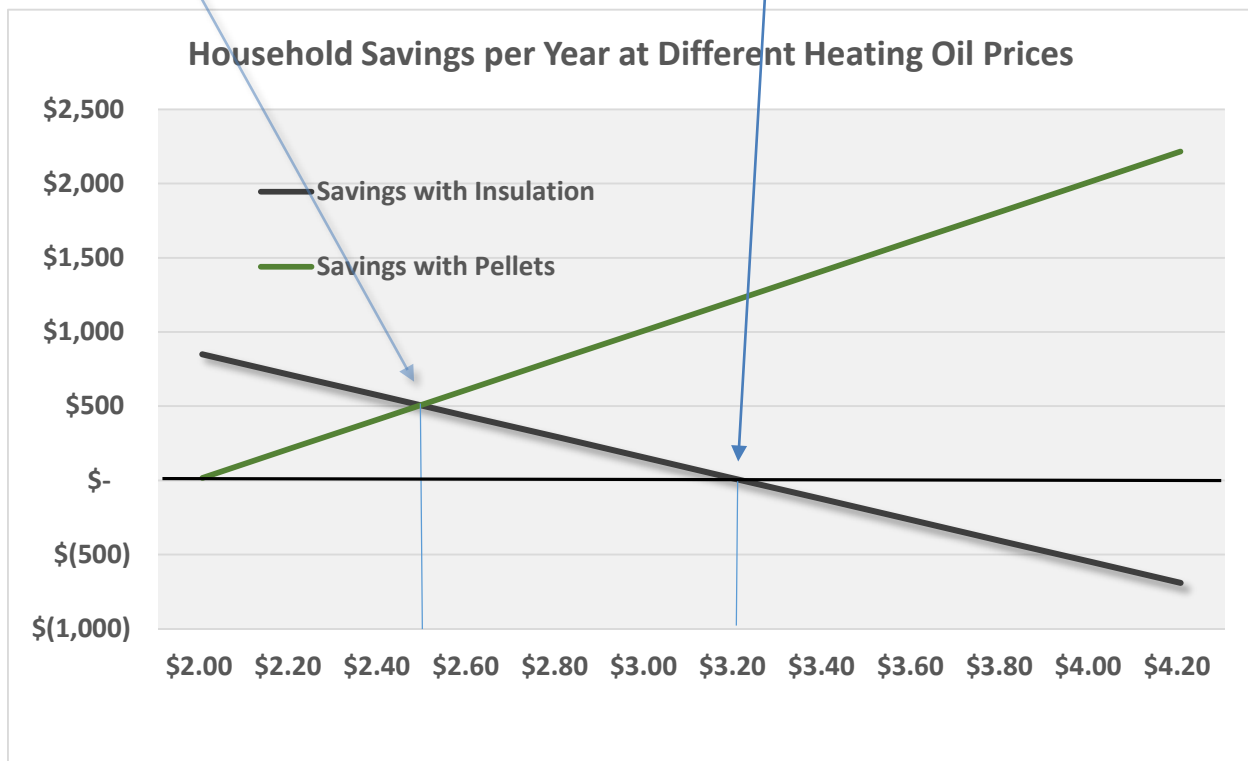


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Annual Cost with Oil at \$2.25/gallon	
Cost NO insulation	\$2,250
Cost WITH insulation	\$1,575
Savings WITH insulation	\$675

However, if heating oil prices increase from \$2.25/gallon, the difference between the annual heating bill before the insulation upgrade and the annual bill after the upgrade declines from \$675. They use fewer gallons per year but the gallons cost more; so their heating bill rises. When heating oil prices increase and pellet prices remain stable (as they have historically), the savings versus the cost of heating oil to those homeowners that switched from heating oil to pellets (even without the benefit of an insulation upgrade) increase.

The chart below shows two things: (1) As heating oil prices increase and the homeowner's heating bill rises, the homeowner's savings from a better insulated home decreases as the total cost to heat the home trends toward the annual cost before insulation. At about \$3.20/gallon, the homeowner's annual costs are the same as before the insulation upgrade and their savings go to zero; and at any price above \$3.20/gallon the homeowner is worse off than before insulation upgrade in terms of the cost per year to heat the home. (2) At heating oil costs above \$2.00/gallon, the homeowner that converted from heating oil to wood pellets saves money relative to the cost to heat with heating oil. At heating oil prices above about \$2.55/gallon, the homeowner using pellets without an insulation upgrade saves more money than the homeowner using heating oil in the better insulated home. If heating oil reaches the average price seen in 2014, the pellet fueled home saves \$1,890 more per year than the better insulated home that uses heating oil.



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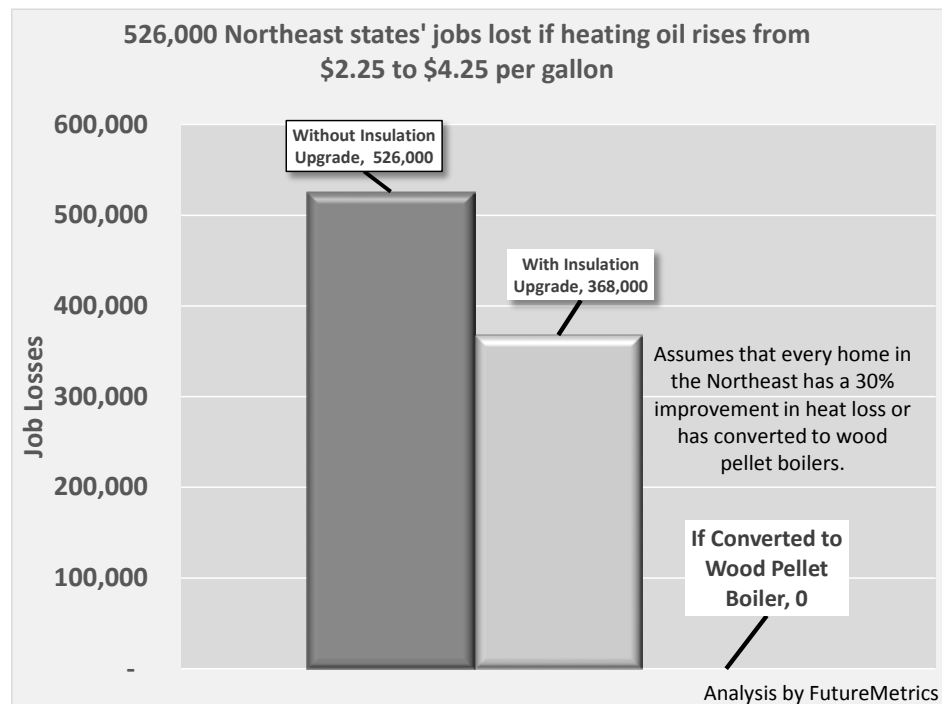
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The positive economic impacts of an insulation upgrade program on the economy only work if heating oil prices remain low. As soon as heating oil prices pass about \$3.20/gallon, there is no net benefit to the economy or the homeowner.

Furthermore if state or local policy promotes insulation upgrade programs before programs for converting from heating oil to pellet fuel, those homes will still be using imported heating oil. Even with the decreased heat losses, the purchase of heating oil for those homes will send hundreds of millions of dollars per year out of the heating oil dependent states. That exported money takes jobs with it and, with multiplier effects, robs the states of billions of dollars in worker income. A significant proportion of that exported money makes it way to foreign oil producing nations.

From the significant savings that homes accrue by using wood pellet fuel in modern high efficiency automatic pellet boilers, the homeowner can then afford to tighten their homes. Switching from heating oil to regionally made pellets for home heating allows the homeowner to have the benefit of savings on their annual heating bill no matter how high the cost of heating oil goes. That strategy assures that the homeowner will not see their annual heating bill increase with heating oil price increases, and it will provide significant positive economic benefits and job creation for the northeastern states that are heating oil dependent. Pellet fuel is produced locally not by a distant and sometimes foreign countries. And as a bonus it is a renewable and low carbon source of energy.

Insulation upgrades are essential to increase the energy efficiency of our homes. But policymakers should recognize that before the upgrades, the homes need to be switched to lower cost and much less volatile wood pellet fuel that is produced locally. That will guarantee that not only are homes more efficient, but that the homeowners are not exposed to seeing their heating costs once again rise to levels that lower the disposable income of families and rob the economy of commerce and jobs.



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