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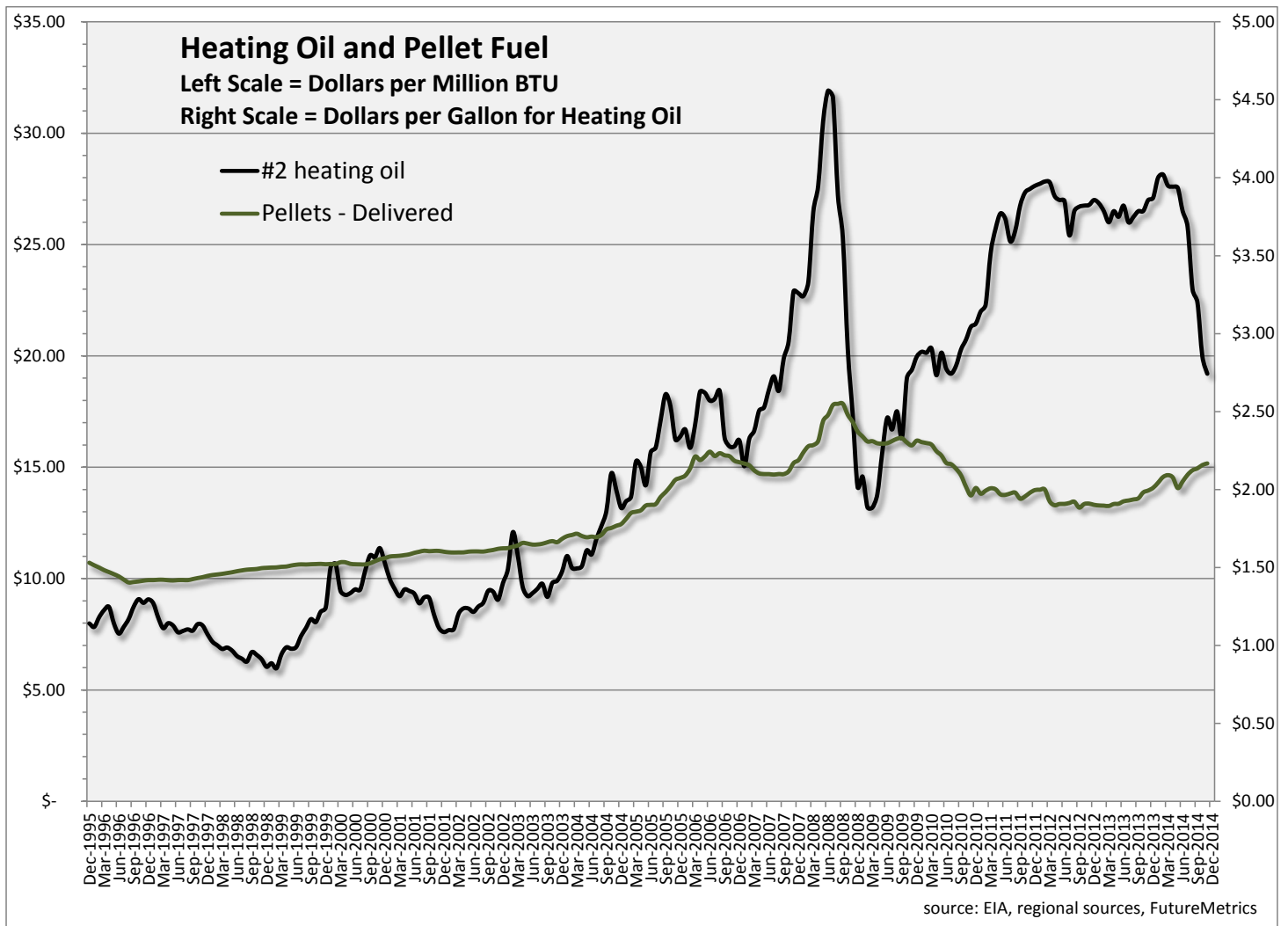
What will be the Impact of Crashing Oil Prices on the US Premium Heating Pellet Markets?

By William Strauss, PhD, President, FutureMetrics

Updated December 1, 2014

Crude oil prices have dropped rapidly in recent months and at the end of November, 2014 have dropped dramatically. From the point of view of consumers of petroleum products, this is a “positive” oil shock. **From the point of view of the premium pellet heating markets, this may be a negative shock.** Lower crude prices lead to lower heating oil prices. Lower heating oil prices will impact demand for wood pellets and pellet burning appliances in the heating markets. If heating oil prices go below about \$2.19/gallon at the retail level then the cost per MMBTU for heating oil and pellets will be about the same (at current pellet prices). At some point, there will be switching from pellet fuel to heating oil.

This brief paper analyzes the potential impact of significantly lower heating oil cost.

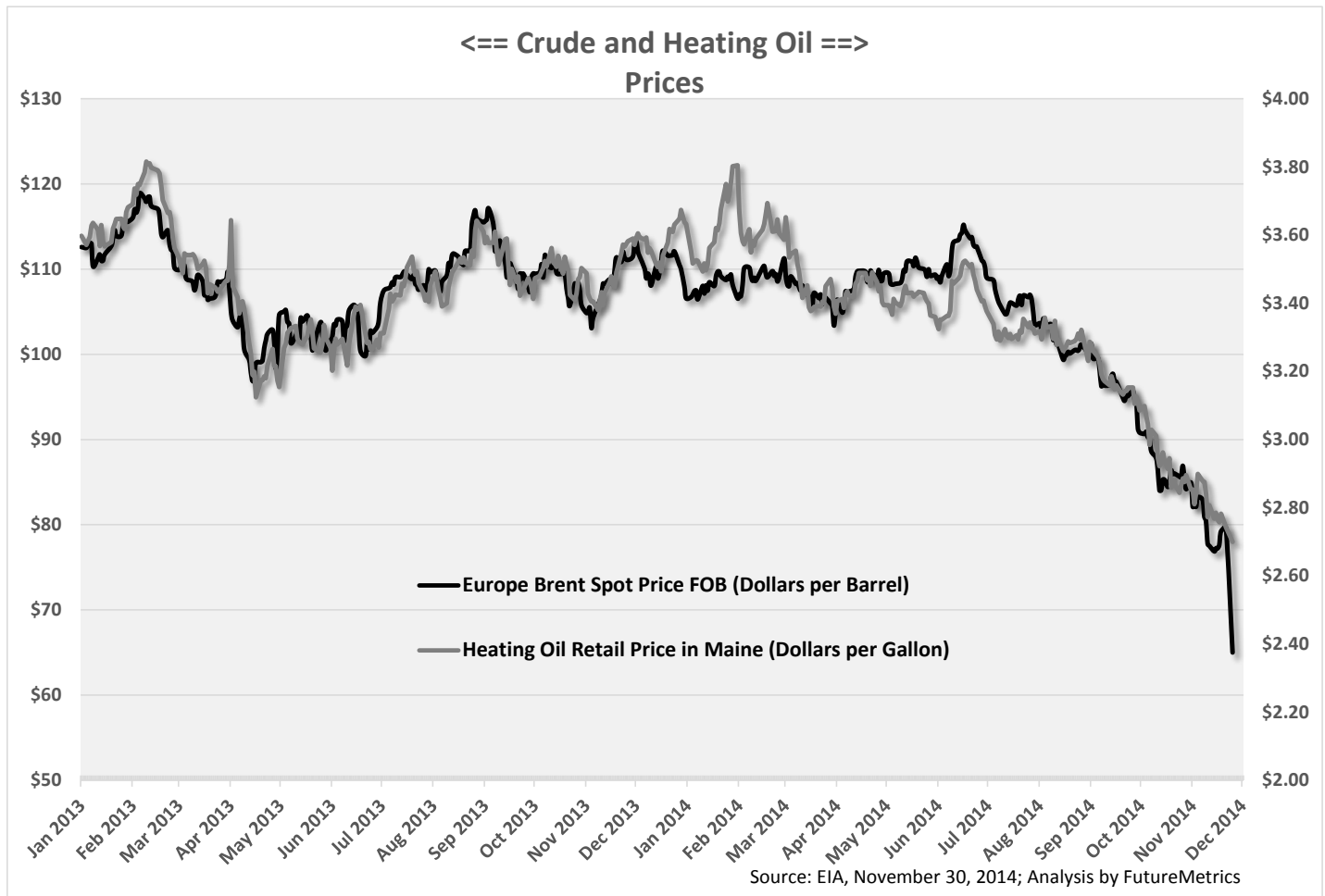




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The chart below shows that heating oil prices are highly correlated with crude prices. If heating oil prices follow historical patterns, we would expect the price of heating oil to fall by forty to fifty cents in the coming weeks. If crude oil prices continue to fall, the point at which consumers may switch from pellets to heating oil may arrive during the winter of 2014-15.



Will crude oil prices continue to fall?

The future of oil prices depends on supply and demand. On the demand side, growth in the global economy has slowed and the growth in demand for commodities including crude has flattened¹. On the supply side, it would appear that OPEC has abandoned a strategy of trying to curtail supply.

Stagnant demand growth and rapidly increasing supply have caused crude oil prices to fall dramatically. The chart below shows the surge in global oil supply September and October of 2014 and the trend in global oil supply over the last 22 months.

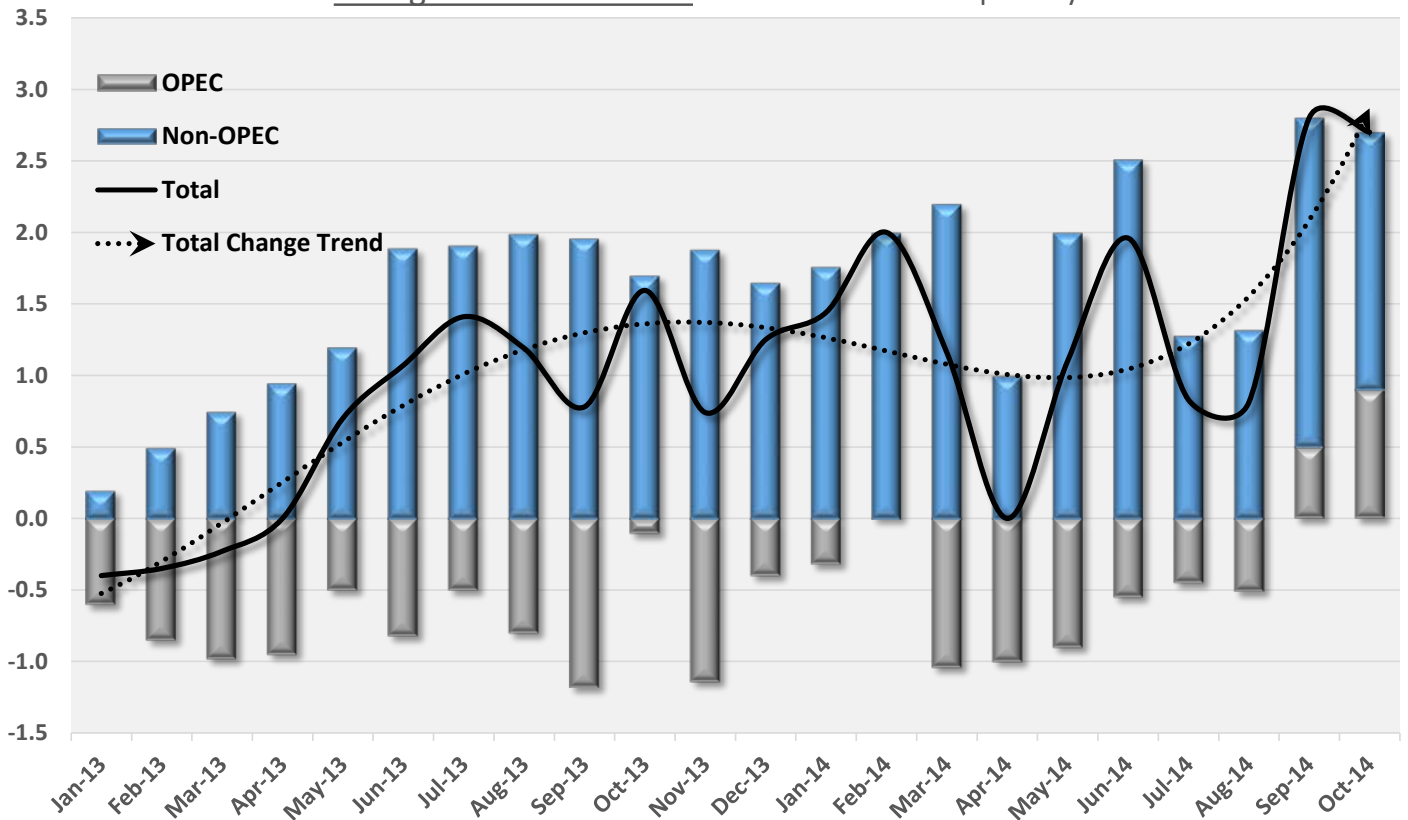
¹ IMF World Economic Outlook, "Legacies, Clouds, Uncertainties," October, 2014.



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Global Oil Supply - Source and Total Change on a Year Earlier in Millions of Barrels per Day



IEA Oil Market Report, Nov. 2014, Analysis by FutureMetrics

OPEC has switched from trying to control global volumes to flooding the markets². If prices fall far enough higher cost producers will drop out. The curtailment of some higher cost production, particularly in the US shale oil patch, suggests the potential for a floor on how far prices can fall. Some estimates put that number at around \$70/barrel³.

At \$70/barrel we would expect to see heating oil retail at about \$2.52/gallon⁴. For heating oil to reach par with pellet fuel in terms of cost per unit of energy (at current pellet fuel prices), crude prices would have to hit about \$55/barrel.

As the chart on the first page illustrates, crude prices may overshoot price floors until higher cost oil extractors curtail operations as they did in 2008-9.

² At the November, 2014 OPEC meeting the cartel decided not to reduce production.

³ \$73/barrel by Robert W. Baird Equity Research, Oct. 14; \$60-\$80/barrel by Morgan Stanley, Oct. 14; \$73.80 by UBS Investment Research, Oct. 14.

⁴ Based on regression analysis by FutureMetrics on historical prices of crude and heating oil.

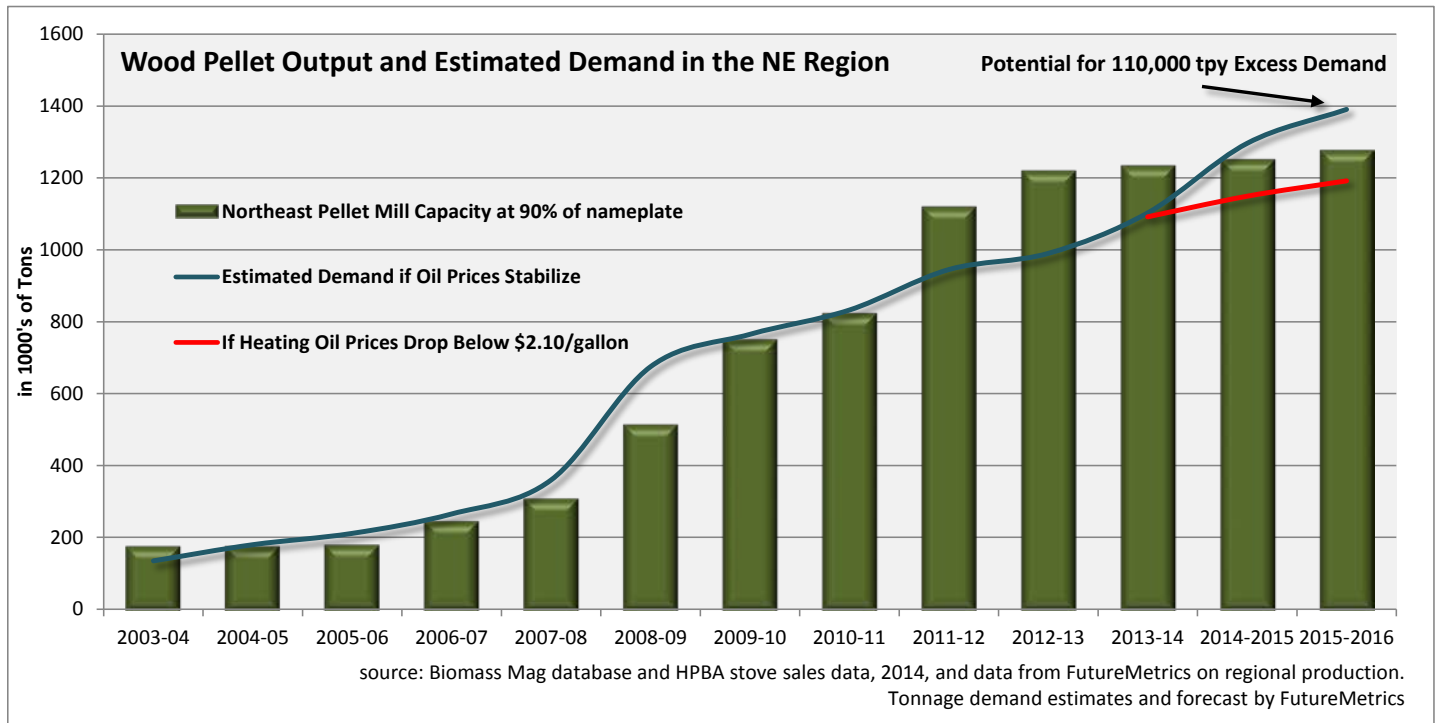


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What does this mean for the domestic premium pellet heating markets? The discussion that follows is focused on the northeastern states which are heavily reliant on heating oil.

The chart below shows the capacity for wood pellet production in the northeast (at an assumed capacity factor of 90%). It also shows the estimated demand for wood pellets⁵.



As the chart above shows, the market at the beginning of the 2014-15 heating season is estimated to be about in equilibrium (supply equaling demand). As the 2014-15 heating season progresses, FutureMetrics has been estimating that demand will slightly exceed regional capacity. There was a significant increase in pellet stove sales since last winter due to high heating oil prices and a long cold winter. **However FutureMetrics did not anticipate the recent rapid and very large drop in crude oil prices.** If crude prices remain below \$60/barrel over the 2014-15 winter and beyond, the lower bound estimate shown by the red line in the chart above becomes more likely to be correct.

The chart above also shows the last time the market was hit by pellet shortages in 2008-09. That was when oil prices spiked and pellet demand exceeded supply. New capacity to meet that increase in demand took 12 to 24 months to come on line. Meanwhile oil prices crashed and the rate of increase in demand flattened. The new capacity was in place by 2011-12 but by then supply exceeded demand. Since then the overcapacity in the region has been challenging for the

⁵ Demand estimates by FutureMetrics are based on pellet stove and pellet boiler sales data, estimates of the average tonnage used per stove and boiler with degree day adjustments, and an assumed attrition rate for older stoves. Supply estimates are based on reported nameplate. Supply in 2015-16 is based on some incremental expansions in capacity of existing mills and one new small mill currently nearing startup. There are some announced projects that have not received construction financing. They are not included.



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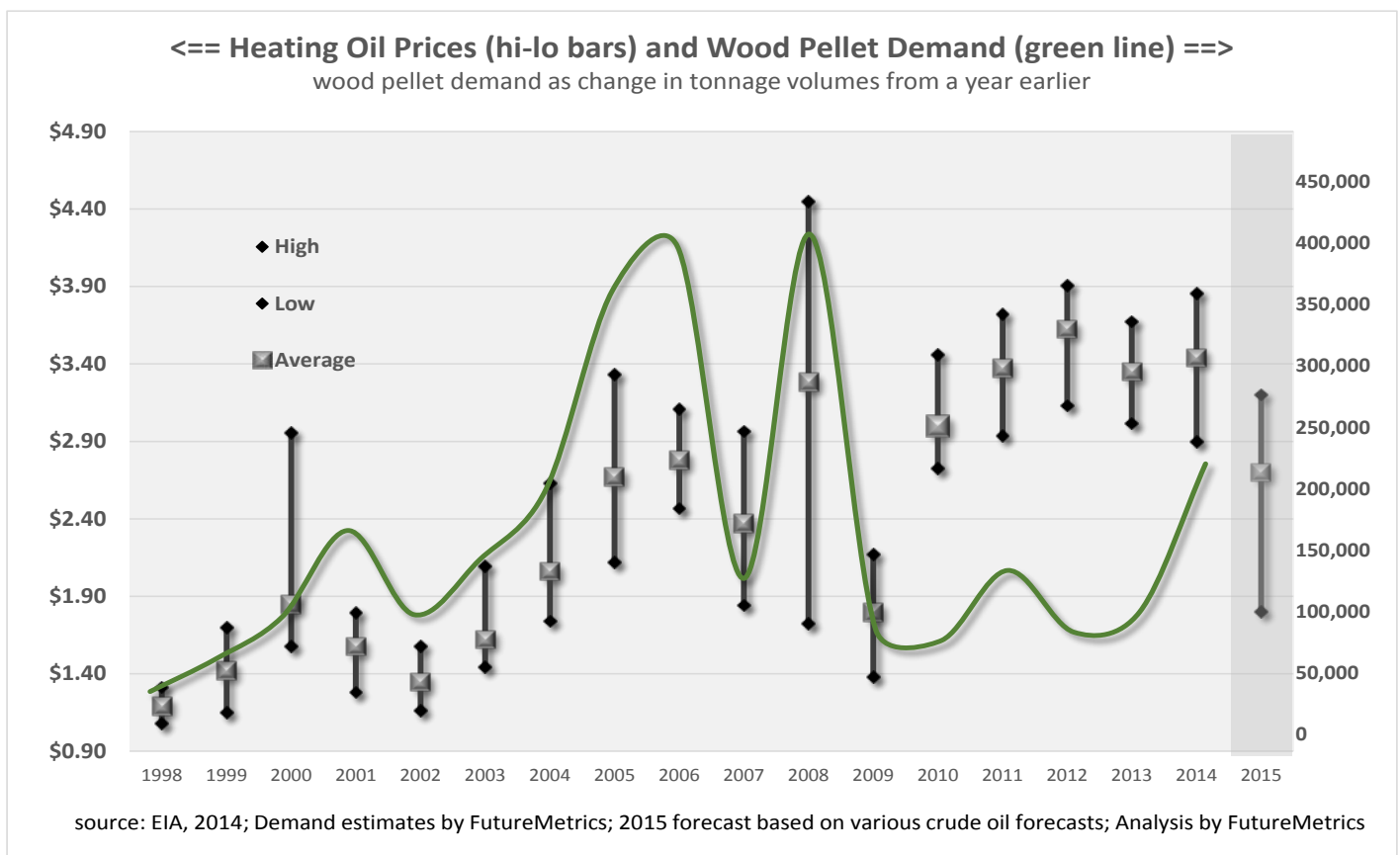
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producers. The overcapacity has also kept prices for pellets in the northeast relatively stable. The previous higher price volatility for pellets was during the last shortage event in 2008.

To further complicate the northeast pellet heating markets, homeowners who had difficulty getting pellets at the end of the 2013-14 winter are buying a whole winter's stock of pellets early and in some cases are hoarding pellets (that is, buying enough for more than one heating season). That demand shock cannot be compensated for in the short term so some shops have had nearly empty lots where there should be many pallets of pellets. That dynamic reinforces the perception of insufficient supply. That will also cause inventory management and demand estimation problems for the producers and retail outlets since purchases of pellets in mid and late winter will be unnecessary for the increased number of households that have pre-stocked or hoarded.

As the chart on the first page shows, the price of pellets has crept up in recent months. This is a natural outcome of excess demand. But in the face of falling oil prices, it may complicate the market dynamics for the sale of pellets and pellet appliances.

Growth in pellet demand is correlated with heating oil price. The chart below shows this relationship. There are other factors driving volumes such as weather, the impact of slow economic growth on pellet appliance sales, and in some regions the price of natural gas. The decoupling after 2009 illustrates the impact of these other factors. The persistence of high heating oil prices, a long and colder than normal 2013-14 heating season, and better economic conditions leading to increased stove and boiler sales has stimulated sales in 2014.





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The 2015 hi-lo bar in the chart above suggests that demand for premium pellets may not sustain the growth rate seen in 2014. If heating oil prices fall into the low \$2/gallon range, then the cost of heating oil per MMBTU is on par with the cost of pellet fuel per MMBTU. That will slow the sales of pellet stoves and boilers, and homes already using pellets may switch back to heating oil. If this happens then demand may not exceed capacity and by mid-winter the pellet producers could be facing curtailments in production. That scenario is shown on the chart on page 4 by the red line.

However, if oil prices revert toward the long-term mean within the next year or so, there is the potential for significant excess demand in the 2015-16 heating season. The demand for premium wood pellets could exceed capacity in the northeast by more than 100,000 tons per year.

There is a bright side for the pellet producers when crude oil prices are low. Diesel fuel prices will also fall and diesel cost makes up more than 50% of the total cost of delivered wood to the pellet mills. Thus the cost of delivered wood should fall. If wood prices fall as would be expected with persistent lower diesel fuel prices, then for a given pellet price, the producers' margin per ton should improve (as long as pellet prices do not fall).

That margin improvement would be welcomed if volumes do not match the expectations of the markets just a few months ago and expectations that are based on pellet sales now. There is the possibility that, for another year or more, there will be overcapacity in the northeast pellet heating markets.

If that is the case, then the low cost producers and those producers closest to their markets will have an advantage. Moving pellets long distances adds many dollars per ton to the cost of getting those pellets to end users.

As the chart on page 5 shows, even in years in which factors depressed aggregate growth in the demand for wood pellets in the northeast, growth in demand never fell below 50,000 tons per year.

If crude oil prices drop well below \$50/barrel and remain there, it is possible that the aggregate demand for wood pellets will fall. It is likely, given the risk that crude oil prices will fall farther, that the growth rates that were expected as recently as four months ago will not materialize.