

# Comparing the Value Added from Pulp and Paper Manufacturing with that of Pellet Manufacturing in the State of Maine: The future of Maine's forest products sector requires thorough strategic planning.

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March, 2009

A recent article that has circulated amongst Maine policymakers ("The Best Use of Wood"<sup>1</sup>) clearly makes a case against the use of pulpwood to make electricity. However, the article, by not including in the analysis the use of pellets or chips to fuel boilers for direct heating of buildings, sends a message that pulp grade wood should only be used to make pulp since that is the "best use of wood".

This short brief will show that using wood to make pellets for direct heating in modern high efficiency boilers is a high value added use of Maine's forest products resources and is a valuable addition to Maine's forest products manufacturing sector.

We agree with the article's conclusions regarding pulpwood to power. Using bark, limbs, and tops that would otherwise be wasted to make electricity is an important part of the efficient use of the resource. But, as the article by Thorp and Masood suggests, using wood chips from debarked pulp grade roundwood for power generation is not an efficient use of the raw materials. But the impression that the reader of that article gets is that any other use of pulpwood other than for making pulp lowers the value added from the use of the raw materials by a factor of 4 to 10 times. That may be true for pulpwood to power but it is not the case with pulpwood to pellets. The remainder of this brief illustrates the value of pellet manufacturing in Maine.

Value added from pulp and paper manufacturing in Maine was estimated at \$1.8 billion dollars in 2006<sup>2</sup>. The pulp and paper sector processed approximately 8.49 million tons of green wood that year<sup>3</sup> to generate the \$1.8 billion in value added. That works out to a value added of about \$212/ton of green wood. The actual value added per ton will vary over time with the prices of wood, pulp, and paper (and other costs).

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<sup>1</sup> Thorp, B.A. and Akhtar, Masood, Paper 360 Magazine, p. 26-29, Jan/Feb, 2009.

<sup>2</sup> From "The Economic Importance and Wood Flows from Maine's Forests, 2007", North East State Foresters Association; with the original data from the US Dept. of Commerce, Bureau of Economic Analysis, 2006. <http://www.nefainfo.org/publications/2007%20Publications/NEFAEconomicImportME.pdf>, Note that the value in the publication differs from the value added for Maine pulp and paper manufacturing reported by the BEA. The value reported by the BEA in 2006 is \$1.1 billion <http://www.bea.gov/regional/gsp/>. This analysis uses the higher number.

<sup>3</sup> Maine Forest Service data.

In order to compare pulp to the value added from pellet fuel production, consider a scenario in which 10% of residences in Maine were to convert to wood pellet fuel, it would require approximately 555,000 tons of green wood per year to make approximately 325,000 tons of pellet fuel per year. The value added calculation considers the aggregate savings on fuel costs, which is a net positive cash flow to the state created by the difference in the cost of pellet fuel versus heating oil, plus the aggregate value added to the wood in pellet manufacturing. At current retail pellet and heating oil prices (\$260/ton and \$2.29/gallon) the direct value added from producing 325,000 tons of pellets is about \$65.9 million. The additional value added from the fuel cost savings is about \$8.3 million. That additional value is minimal because the cost of a BTU from oil is not that much greater than pellets due to low oil prices (the breakeven with pellets at \$260/ton is about \$2.17/gallon). That works out to a direct value added from pellets of about \$119/ton of green wood and the value added from fuel savings of about \$15/ton of green wood. The total value added is \$134<sup>4</sup>. As with pulp and paper making, the actual value added will vary with costs and prices.

Using last year's heating oil prices, the value added from pellet making per green ton was significantly higher. Using retail prices of \$280/ton and \$4.50/gallon, the total value added from pellet making in Maine was \$336/ton

What is more interesting for the future of Maine and the determination of "best use" is the forecast for heating oil prices. Using the EIA's forecasts for heating oil prices over the next 10 years, that calculation comes to a total of \$261/green ton (in 2009 dollars). The net annual value added under that scenario is estimated to be \$144,400,000 per year<sup>5</sup>.

The table below shows the value added per ton of green wood generated by the pellet manufacturing sector at various combinations of heating oil prices and wood pellet prices. As the table shows, given the expected prices of heating oil and pellet fuels, pellet fuel manufacturing will provide on average over the next 10 years about \$261 of value added per ton of green wood.

We do not have a model for the expected value added from the pulp and paper sector over the next ten years by which to calculate an average for the decade. However, anecdotal data suggests that there are few efficiencies left to be found in the processes and that global challenges will prevent pulp and paper prices from appreciating significantly. We expect that before the end of the next decade, the net value added from pellet fuel manufacturing will exceed the value added from using the wood to make paper and will remain higher thereafter.

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<sup>4</sup> This assumes that all pellets are used in modern high efficiency boilers and that the pellet fuel is offsetting the use of an equivalent amount of energy from heating oil.

<sup>5</sup> The difference in fuel prices are based on 10 year average expected heating oil price forecasts from the Energy Information Administration (<http://www.eia.doe.gov/oiaf/forecasting.html>) at \$3.68/gallon and from pellet fuel price forecasts by FutureMetrics based on a 10 year average green wood cost of \$53/ton. All dollar values are normalized to 2009 dollars. The 10 year average annual fuel savings is \$63.0 million. The average direct annual value added is \$81.4 million for a total of \$144.4 million in average annual value added. Divided by the annual green tonnage used of 554,000 yields an expected average value added per ton of \$261.

Neither of these value added calculations include multiplier effects. Most of the economic benefits from the pellet scenario would remain in Maine and spread across every segment of the population in every part of the state where pellet fuel replaces #2 oil; whereas a significant proportion of pulp manufactured in Maine is shipped elsewhere<sup>6</sup> for further value added. At current prices for heating oil, about \$710,000,000 of the money spent on heating oil leaves Maine every year<sup>7</sup> and much of that leaves the country. Using regionally produced American made fuel rather than foreign oil will have very significant multiplier effects.

Value Added by Pellet Production per Ton of Green Wood							
	Pellet Prices per Ton						
	\$260.00	\$270.00	\$280.00	\$290.00	<b>\$300.00</b>	\$310.00	\$320.00
\$2.80	\$180.12	\$179.67	\$179.13	\$178.51	\$177.82	\$177.06	\$176.25
\$2.90	\$189.35	\$188.90	\$188.36	\$187.74	\$187.05	\$186.29	\$185.48
\$3.00	\$198.58	\$198.13	\$197.59	\$196.97	\$196.28	\$195.52	\$194.71
\$3.10	\$207.81	\$207.36	\$206.82	\$206.20	\$205.51	\$204.75	\$203.94
\$3.20	\$217.04	\$216.59	\$216.05	\$215.43	\$214.74	\$213.98	\$213.16
\$3.30	\$226.27	\$225.82	\$225.28	\$224.66	\$223.97	\$223.21	\$222.39
\$3.40	\$235.49	\$235.05	\$234.51	\$233.89	\$233.20	\$232.44	\$231.62
\$3.50	\$244.72	\$244.27	\$243.74	\$243.12	\$242.42	\$241.67	\$240.85
\$3.60	\$253.95	\$253.50	\$252.96	\$252.35	\$251.65	\$250.90	\$250.08
<b>\$3.70</b>	\$263.18	\$262.73	\$262.19	\$261.57	<b>\$260.88</b>	\$260.13	\$259.31
\$3.80	\$272.41	\$271.96	\$271.42	\$270.80	\$270.11	\$269.35	\$268.54
\$3.90	\$281.64	\$281.19	\$280.65	\$280.03	\$279.34	\$278.58	\$277.77
\$4.00	\$290.87	\$290.42	\$289.88	\$289.26	\$288.57	\$287.81	\$287.00
\$4.10	\$300.10	\$299.65	\$299.11	\$298.49	\$297.80	\$297.04	\$296.22
\$4.20	\$309.33	\$308.88	\$308.34	\$307.72	\$307.03	\$306.27	\$305.45
\$4.30	\$318.55	\$318.11	\$317.57	\$316.95	\$316.26	\$315.50	\$314.68
\$4.40	\$327.78	\$327.33	\$326.80	\$326.18	\$325.48	\$324.73	\$323.91
\$4.50	\$337.01	\$336.56	\$336.02	\$335.41	\$334.71	\$333.96	\$333.14

Furthermore, as the data from the Maine Forest Service shows in the chart that follows, the amount of pulpwood processed into pulp has been trending downward since the late 1990's. The decline in demand of more than 1.5 million tons per year is significantly more than the current demand for pulp grade wood by Maine pellet manufacturers<sup>8</sup>. That is a loss of 1.5 million green tons per year that contributes no value added in Maine. Thus, even at current pellet and heating oil prices, the value added from pellet manufacturing in Maine (\$74.2 million/year at current prices) would be completely forgone if no pellets were made in Maine.

The diversification of the Maine forest products sector into the production of refined wood pellet fuel for homes and businesses is a valuable use of the forest resource. The article titled "Best Use of Wood", which does not include the type of analysis contained in the this brief or an acknowledgement that the

<sup>6</sup> \$267 million of pulp was exported from Maine in 2008. That represents 9% of all of Maine's exports in 2008. Data is from the Maine Development Foundation and the Maine Economic Growth Council, Feb., 2009.

<http://www.mdf.org/megc/individualindicators/iex.pdf>

<sup>7</sup> From the EIA: <http://www.eia.doe.gov/bookshelf/brochures/heatingoil/index.html>. At last summer's prices (\$4.59/gallon), more than \$1.4 billion per year would be drained from the Maine economy.

<sup>8</sup> According to the Maine Pellet Fuels Association, the three mills in Maine use about 450,000 tons per year of green wood. [www.MEPFA.org](http://www.MEPFA.org)

diversification of the use of forest products is strategically sound, incorrectly sends a message to policymakers that pulp and paper is the only way to go.

**Reported Processing of pulpwood (Tons)  
(Displayed as a 5-year trailing average)**

