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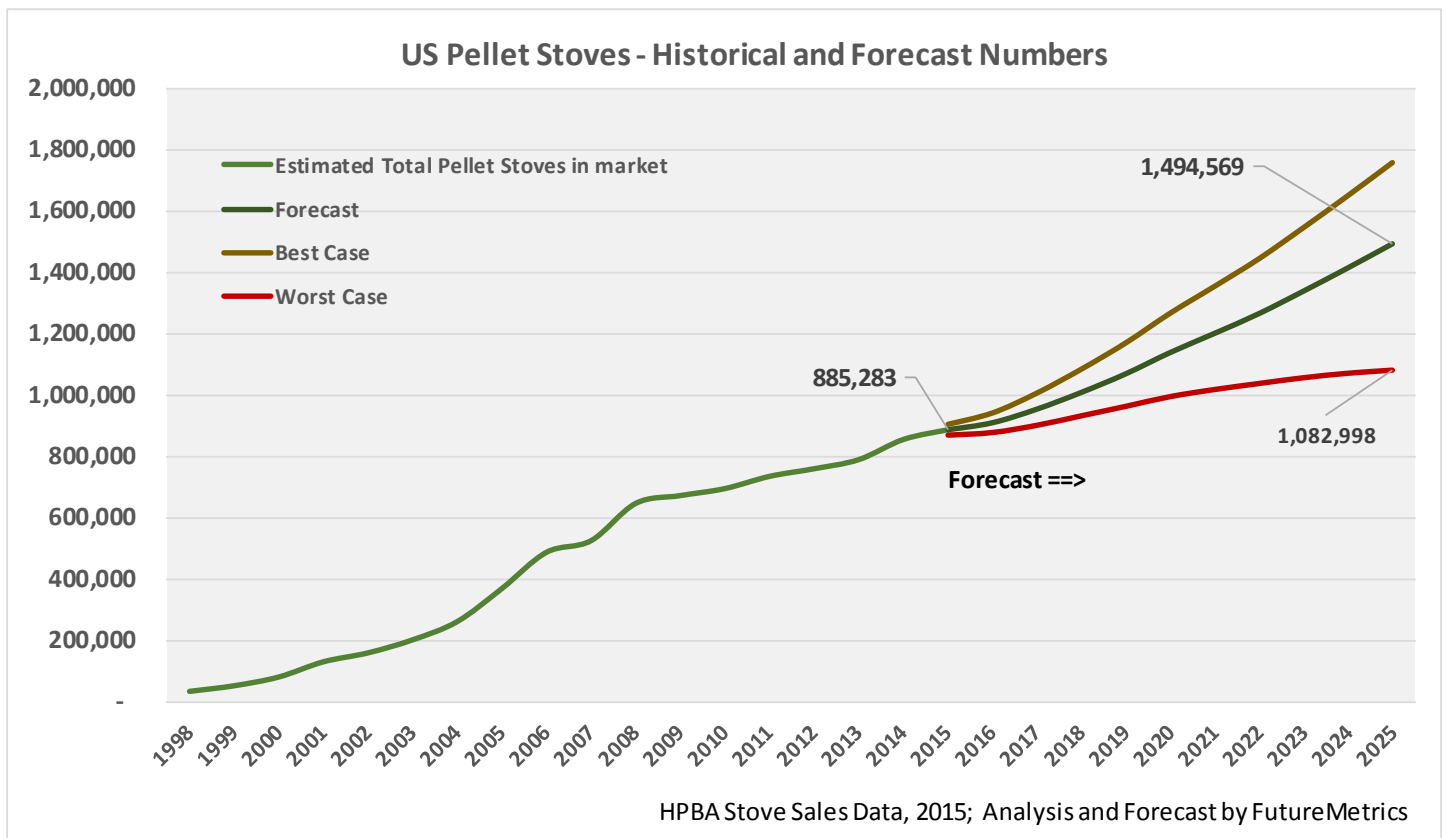
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Why is the Heating Pellet Market in Canada so Small?

Why One Province Will Soon Embrace Pellets for Heating!

By William Strauss, PhD – October 30, 2015

The US heating pellet market consumes an estimated 3.3 million tons per year of pellets in hundreds of thousands of pellet stoves and thousands of pellet boilers. Over the next ten years the US is expected to increase the number of pellet stoves from about 880,000 to about 1.5 million. Demand for premium wood pellets will grow with the growth in stoves. Much of the growth has been in the NE US states where about 2.3 million tons per year are consumed in pellet stoves and pellet fueled central heating systems.



Canada has at least as much demand for heating energy by homes and businesses as the NE US states.

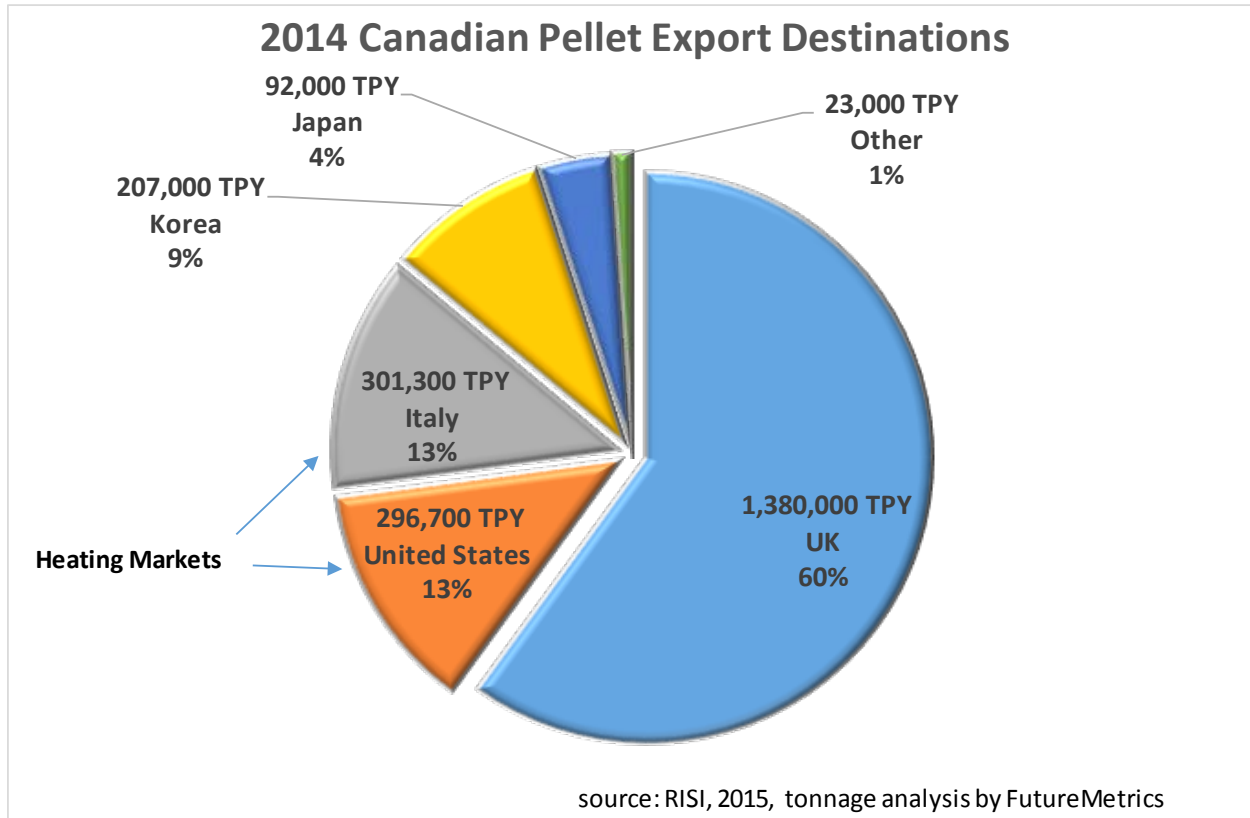
And much of Canada has the natural resources to produce wood pellets. Many of the Canadian provinces have abundant forest cover; and a large proportion of that forest has traditionally been used to provide feedstock to sawmills and to pulp and paper producers. Canada also has some of the best sustainably managed forestry practices of any country in the world. Because of the abundance of sustainable wood, Canada is a world class producer of wood pellets. Most of that production is for the



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industrial wood pellet markets fueling power plants in other countries. About 26% of Canadian production for export is for the heating markets in the US and Italy.



Relatively few Canadian pellets are used for heat in Canada. FutureMetrics estimates that the total premium heating pellet market in Canada is about 360,000 metric tonnes per year. That is about one tenth the size of the US heating pellet market.

There is no reasonable constraint on the production of wood pellets for heating in Canada.

The reason that most Canadian homes do not use wood pellets is not due to the potential for a robust premium wood pellet production sector in Canada.

So why is the Canadian heating pellet market so small?

The answer begins with **“how do most Canadian’s heat their homes?”** The table below shows that most homes in Canada, with the exceptions of Prince Edward Island and Nova Scotia, are heated by either electricity or natural gas.



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	Heating Fuel for Homes in Canada				
	Electricity	Natural gas	Oil	Wood	Propane
Canada	39%	50%	7%	6%	1%
Newfoundland and Labrador	71%	0%	21%	22%	0%
Prince Edward Island	0%	0%	76%	32%	0%
Nova Scotia	29%	0%	54%	26%	0%
New Brunswick	66%	0%	13%	23%	0%
Quebec	85%	3%	8%	7%	0%
Ontario	14%	76%	5%	3%	2%
Manitoba	37%	61%	0%	0%	0%
Saskatchewan	11%	87%	0%	0%	0%
Alberta	9%	91%	0%	0%	0%
British Columbia	39%	55%	3%	5%	0%

source: Statistics Canada, Oct. 2015, analysis by FutureMetrics

Some provinces such as QC, NL, and NB are heavily reliant on electricity. Only PEI and Nova Scotia buck the trend of using either NG or electricity for heat.

As a result, the power use per person per year in those provinces heavily reliant on electricity for heat is significantly higher than the Canadian average.

MWh's per Person/Year	Red - Above Avg Green - Below Avg
Canada	4.03
Newfoundland and Labrador	6.59
Prince Edward Island	3.16
Nova Scotia	4.37
New Brunswick	6.72
Quebec	6.39
Ontario	3.12
Manitoba	4.34
Saskatchewan	2.87
Alberta	2.23
British Columbia	3.70

source: Statistics Canada, Oct. 2015, analysis by FutureMetrics

Quebec has relatively low electricity rates. But Newfoundland and Labrador, and New Brunswick do not. Taking the total population of each province and the total electricity use for heating in each province, the table below show the average cost per person for electricity for heating.



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Cost per Person/Year for Heat	Electricity per MWh	Cost per person
Newfoundland and Labrador	\$124.00	\$817
Prince Edward Island	\$169.00	\$535
Nova Scotia	\$157.00	\$685
New Brunswick	\$113.00	\$759
Quebec	\$68.00	\$434
Ontario	\$141.00	\$440
Manitoba	\$179.00	\$777
Saskatchewan	\$132.00	\$378
Alberta	\$122.00	\$272
British Columbia	\$89.00	\$330

source: Statistics Canada, Oct. 2015, analysis by FutureMetrics

NL tops the list at \$817 per person per year. Other provinces also have high power costs but they are not as reliant as NL and NB on electricity for heat.

The provinces that would be expected to be replacing current heating energy sources with wood pellets are NL, NB, PEI, and NS which have no natural gas and are reliant on electricity and/or heating oil.

Why these provinces lag the NE US in embracing wood pellet heat, either in stoves or central heating systems, is not explained by the heating fuel cost comparison. Perhaps the use of electricity has been traditional and, as of yet, consumers are more or less unaware of the value of using a pellet stove to offset costs or a pellet furnace/boiler to do their central heating.

But FutureMetrics does not expect them to lag for much longer.

In particular, we expect NL to rapidly, and in the near-term, embrace wood pellet heat. NL, which already pays the most per person for heating, is facing a significant increase in that cost. The Lower Churchill project at Muskrat Falls is an 825 MW hydro project that is expected to be fully online within the next four years. The dams and the transmission interconnection via Labrador and undersea to Newfoundland are being built at a \$6.9 billion capital cost¹. The map below, courtesy of Nalcor, shows the scale of the Labrador-Island transmission link into the NL market.

Most estimates are for at least a 50% increase in power rates soon after the project is online².

¹ From Nalcor Energy, "Muskrat Falls Project Cost – Sources and Uses of Funds Summary". Recent reports show cost overruns and estimate the project capital cost now at \$7.65 billion.

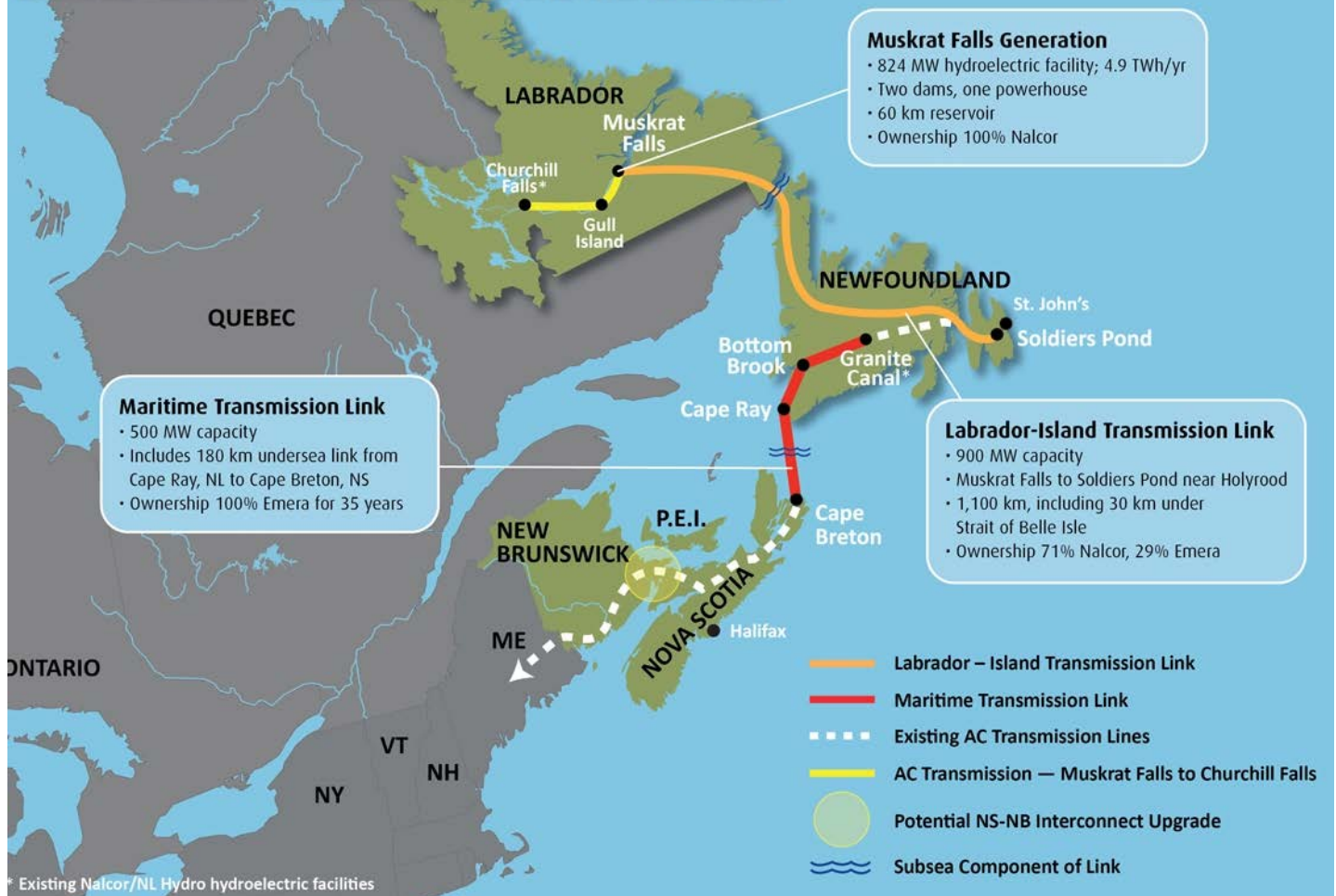
² Nalcor's "Questions and Answers – Electricity Rates in NL – Updated Aug. 20, 2014" shows a rate of \$0.164/kWh in 2018 rising to \$0.182/kWh by 2030. However, given the cost overruns since that report, many media reports have rates above \$0.18/kWh by 2020.



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Phase 1 – Muskrat Falls Labrador-Island Transmission Link and Maritime Link



Once the full capital cost is worked into the rate structure, the cost per person for heat in NL will increase by about \$36/month.

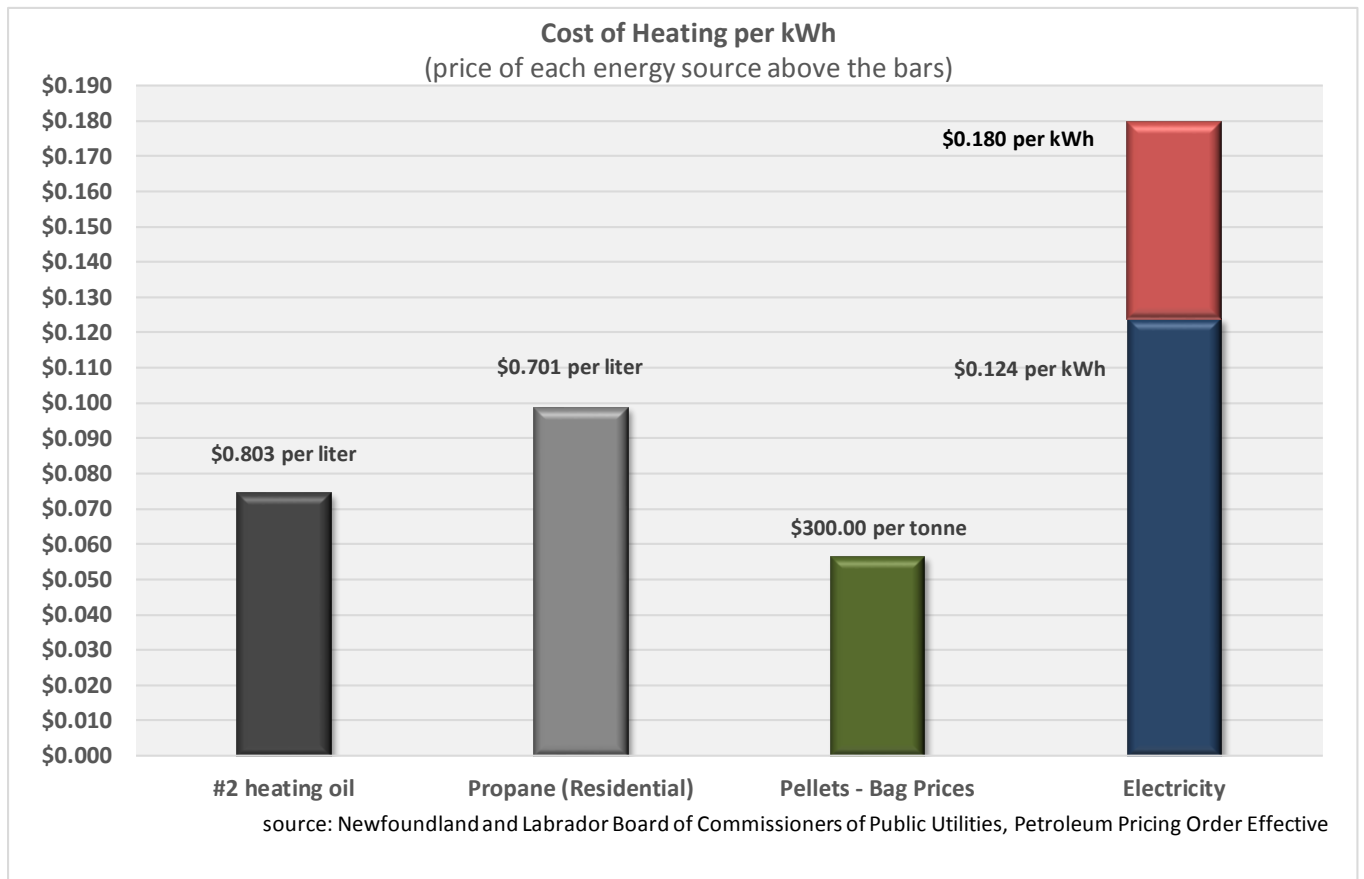
Cost per Person/Year for Heat	Pre-Muskrat Falls		Post Muskrat Falls	
	Electricity per MWh	Cost per person	Electricity per MWh	Cost per person
Newfoundland and Labrador	\$124.00	\$817	\$180.00	\$1,186

The chart on the following page shows the relative cost per kWh for heating energy at current average prices from the energy sources available for Newfoundlanders and Labradoreans.



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71% of NL homes and businesses will be impacted by the electricity rate hike. 71% of homes and businesses will notice that **pellet heat, at current pricing in NL, is 1/3 the cost for the same heating energy.**

Even without an impending rate hike, pellet fuel is the lowest cost way to heat.

If this information is communicated in advance of Muskrat Falls coming online, we would expect the wood pellet heating market in NL to grow rapidly.

The European pellet heating markets have led the way with several decades of growth. The US followed. It is Canada's turn next.

In particular, just like the dependence on what has been traditionally costly heating oil in the NE US has driven that pellet market growth, the dependence on costly electricity will drive the markets first in Newfoundland and Labrador, and soon after in New Brunswick. When heating oil prices rise again, Prince Edward Island and Nova Scotia will follow.