Status Update: Canadian Wood Pellet Industry

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Topics

- Wood pellets 101
- Where pellets fit in the bioenergy sector
- Where pellets fit in the forestry sector
- Pellet fibre sources
- Production and consumption statistics
- Export markets
- Canadian market opportunity
Wood Pellets 101

- Renewable fuel
- Made from compressed wood fibre.
- Lignin binds the fibre. No adhesives needed.
Wood pellet uses

Power generation  
Efficiency ~ 35%

Heat, & hot water  
Residential/commercial/institutional  
Efficiency ~ 90%

Animal bedding & oil patch absorbent

Wood Pellet Association of Canada
Leading Bioenergy Products

- **Ethanol** – 1.6 bn litres per year. Net importer. Made from corn and wheat. National mandate – 5%.
- **Biodiesel** – 350 mn litres per year – most exported to USA, then re-imported as blended diesel. Canola, animal fats, recycled cooking oils. Mandate - 2%.
- **Wood pellets** – 2.7 million TPY, 90% exported.
The Pellet Sector within Canada’s Forest Industry

- Annual log harvest: 130 million tonnes
- Fibre used for pellets: 5 million tonnes (4%)
- Annual forest products revenue: $60 bn
- Annual revenue from pellets: $0.3 bn (0.5%)
Canadian Wood Pellet Plants

- 44 pellet plants in Canada
- 4 million tonnes annual capacity
- 1 million tonnes new capacity 2015-16
BC Export Pellet Plants > 75,000 tonnes

1. Pinnacle Renewable Energy
2. Pinnacle Renewable Energy
3. Pinnacle Renewable Energy
4. Pacific BioEnergy
5. Premium Pellet
6. Pinnacle Renewable Energy
7. Canfor/Pinnacle Pellet
8. Tolko/Pinnacle
9. Canfor/Pacific BioEnergy
10. Canfor/Pacific BioEnergy

Planning Stage: Newpro announced conversion of a particle board plant to produce 80,000 TPY of pellets in Smithers
Wood Pellet Fibre Sources

Sawmill residues
- sawdust and shavings
- Typically not wood chips

Logging residues

Pellet producers often trade with pulp mills – bark in exchange for sawdust/shavings
Bush Grinding Harvest Residuals
Wood Pellet Extrusion
Wood Pellet Global Production – millions of tonnes

2010 to 2015 average annual growth – 14%

Sources: Hawkins Wright, REN 21, Future Metrics
World Regional Pellet Production – 2015
Millions of Tonnes

Top European Producers:
- Germany
- Sweden
- Latvia
- Estonia
- France
- Portugal

Total – 27 mn tonnes
- USA, 7.4
- Canada, 1.9
- Europe, 14.3
- Russia, 1.0
- Vietnam, 1.1
- ROW, 1.4

Sources: REN21 Global Status Report 2016, Hawkins Wright
Europe continues to dominate
Europe’s heat sector exceeds industrial sector
EU Policy Support

- 2010: National Action Plans
- National support schemes: green certificates, contracts for difference, renewable heat incentive
- 2014: Climate and Energy Framework for 2030 – 40% GHG cut from 1990, 27% renewable energy, 27% improvement in energy efficiency
Global Demand Outlook to 2024

Average 4.8 mn tonnes per year of growth
Assumes some co-firing in Canada and USA
After 2018, most growth occurs in Asia

Data Source: Future Metrics
5 European Biomass Power Projects

- EPH Lynemouth, UK: 645 MW, 2.5 mn TPY
- MGT Teeside, UK: 299 MW, 1.6 mn TPY
- Langerlo, Belgium: 420 MW, 1.0 mn TPY
- RWE Amer, NL: 600 MW, 1.2 mn TPY
- Engie Maaslavke, NL, 800 MW, 0.2 mn TPY
5 Asian Biomass Power Projects

- KOSEP Yeongdong, SK, 125 MW, 0.6 mn TPY
- KOSPO Samcheok, SK, 2,000 MW, 0.4 mn TPY
- Nakayama Nagoya 2, JPN, 110 MW, 0.1 mn TPY
- Soma Kyodo Jikahatsu, JPN, 112 MW, 0.02 mn TPY
- Orix Hibikinada, JPN 112 MW, 0.1 mn TPY
North American pellet shipping routes
Canadian Export Destinations – thousands of tonnes

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<th>Country</th>
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Wood Pellet Association of Canada
Developments in Asia-Pacific

- Demand in Japan and Korea is growing
- Policy uncertainty remains.
- Asia-Pacific and Russian pellet producers have transportation advantage over NA
- Canadians have quality and reliability advantage
Primarily an industrial market

Feed-in-tariff for IPPs – many under development

Replacement of nuclear power by thermal coal plants and biomass co-firing

Consumes chips, PKS, and pellets

Preference for quality, reliability and long term contracts = advantage for Canada
South Korean Wood Pellet Market

- Primarily an industrial market
- Renewable portfolio standard
- Market is growing
- Price is number one concern
- Purchases dominated by tendering
- Consume biomass SRF pellets
- Dominated by Vietnam
Canada’s competition in Vietnam
Canada’s Climate Change Plan (1)

- “Pan-Canadian Framework on Clean Growth and Climate Change"
- Agreed to in 2016 by federal government, provinces and territories
- 2030 target: 30% GHG reduction from 2005 level
- Pricing carbon pollution - $10 per tonne in 2018 rising to $50 per tonne in 2022
Canada’s Climate Change Plan (2)

- Increase renewable and non-emitting electricity (currently 80%, ranked 4th in world)
- Phase out coal power by 2030 (35 million tonnes of coal per year)
- Eliminate diesel power generation in remote communities
OPG’s Atikokan Power Plant

Converted from coal, now firing on 100% wood pellets
Canadian Annual Heat Energy Use by Fuel Type

Residential and Commercial Heat and Hot Water

- Natural Gas: 916 PJ
- Electricity: 766 PJ
- Oil: 183 PJ
- Firewood: 60 PJ
- Wood Pellets: 12 PJ
- Propane & Other: 12 PJ

Total: 2688 PJ

Source: Stats Canada
Ontario Energy Costs 2016

- Heating oil – 86 cents per litre, 85% efficiency
- Natural gas – 27 cents per cubic metre, 85% efficiency
- Wood pellets - $300 per ton, 85% efficiency
- Electricity – 15.4 cents per kWh, 100% efficiency

Source: Enbridge website
Ontario Domestic Fuel Costs - 2016

$/GJ, adjusted for efficiency

Sources: Enbridge, National Energy Board, WPAC research

Wood Pellet Association of Canada
Canadian annual non-gas commercial and residential heat and hot water energy consumption is 1,033,000,000 gigajoules.

1,033,000,000 gigajoules is equivalent to 71 million tons of wood pellets.

Canada currently produces about 2.7 million tons of wood pellets.

Wood Pellet Association of Canada
Conclusions

- The global wood pellet industry is growing
- In the short term, production capacity has outpaced demand, this will be corrected by 2018
- Will see continued growth in Europe and Asia
- Japan is most interesting Asian market
- Significant potential domestic potential
- Limited competition with pulp sector
- Jobs from wood waste!
Thank you!

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