Emerging Pellet Markets in Asia

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Gordon Murray, Executive Director
Topics

- Short introduction to WPAC
- Industry priorities for 2015
- Global overview of pellet trade
- BC pellet sector
- Korean pellet market
- Japanese pellet market
- China
Advocate on behalf of Canadian pellet industry
65 members: pellet producers, ports, stevedoring companies, traders, equipment manufacturers, engineers and consultants, insurance industry & universities.
Promoting Canadian pellet sustainability to Europe
- Getting members SBP certified
- Improving fibre access and security
- Safety
- Advocacy in UK and Netherlands
- Pellet quality certification
- Data collection: boilers, stoves,
Global wood pellet production
About 28Mt in 2015... (Heating = 15Mt, Industrial = 13Mt)

Source: REN21, FAO and Hawkins Wright
World regional pellet consumption – millions of tonnes

Sources: Argus Media, Hawkins Wright
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
## BC Export Pellet Plants > 75,000 tonnes

<table>
<thead>
<tr>
<th>Company</th>
<th>Location</th>
<th>Capacity (000 tons)</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Pinnacle Renewable Energy</td>
<td>Williams Lake</td>
<td>200</td>
<td></td>
</tr>
<tr>
<td>2 Pinnacle Renewable Energy</td>
<td>Quesnel</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>3 Pinnacle Renewable Energy</td>
<td>Strathnaver</td>
<td>220</td>
<td></td>
</tr>
<tr>
<td>4 Pacific BioEnergy</td>
<td>Prince George</td>
<td>360</td>
<td></td>
</tr>
<tr>
<td>5 Premium Pellet</td>
<td>Vanderhoof</td>
<td>190</td>
<td></td>
</tr>
<tr>
<td>6 Pinnacle Renewable Energy</td>
<td>Burns Lake</td>
<td>440</td>
<td></td>
</tr>
<tr>
<td>7 Canfor/Pinnacle Pellet</td>
<td>Houston</td>
<td>220</td>
<td></td>
</tr>
<tr>
<td>8 Tolko/Pinnacle</td>
<td>Lavington</td>
<td>250</td>
<td>Newly commissioned</td>
</tr>
<tr>
<td>9 Canfor/Pacific BioEnergy</td>
<td>Fort St. John</td>
<td>75</td>
<td>Commissioning Q1 16</td>
</tr>
<tr>
<td>10 Canfor/Pacific BioEnergy</td>
<td>Chetwynd</td>
<td>100</td>
<td>Newly commissioned</td>
</tr>
</tbody>
</table>

**Total**: 2155
# BC Biomass Energy Plants Under Construction

<table>
<thead>
<tr>
<th>Company</th>
<th>Location</th>
<th>Capacity</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Veolia Environmental Services</td>
<td>Fort St. James</td>
<td>40 MW</td>
<td>Under construction</td>
</tr>
<tr>
<td>2 Veolia Environmental Services</td>
<td>Merritt</td>
<td>40 MW</td>
<td>Under construction</td>
</tr>
</tbody>
</table>

Each plant will consume 200,000 ODT per year, competing with regional pellet plants. This is a sore point with our industry.
Wood pellet fibre sources

Sawmill residues

Logging residues
North American Pellet Export Destinations

Canadian Exports 2015
- United Kingdom, 74%
- Italy, 6%
- United States, 12%
- Japan, 5%
- Korea, South, 3%

USA Exports 2015
- United Kingdom, 84%
- Belgium, 13%
- All Others, 3%

- Global consumption: ~ 28 mn tonnes
- Canadian exports: 1.6 mn tonnes
- USA exports: 4.4 mn tonnes

Source: Global Trade Atlas (note: 2015 estimated as Nov YTD x 12 / 11)
North American pellet shipping routes

Vancouver to Seoul 9,100 km
Vancouver to Hull 16,800 km
Brunswick to Seoul 18,445 km
Halifax to Hull 5,000 km
Brunswick to Hull 7,100 km
South Korea pellet imports – 2014 & 2015

Thousands of tonnes

Vietnam: 1,030
Malaysia: 743
Canada: 344
Russia: 35
Indonesia: 63
All others: 497

Totals:
2014: 1.850 mn tonnes
2015: 1.456 mn tonnes

Source: Global Trade Atlas (note: 2015 estimated as Nov YTD x 12 / 11)
Coal: 41% of power mix

Pellet demand is driven by RPS: 2012 – 0%, 2024 – 10%

Biomass co-firing is cheapest but capped at 30% of renewable mix

Five state-controlled utilities – 85% of pellet market (KOSEP, KOMIPO, KOWEPO, KOSPO, EWP)
- All purchases by tender – totally price driven
- Vietnam has 70% of the market
- Canada price 2014: $193 per tonne
- Vietnam price 2015: $95 per tonne
- Vietnam to South Korea shipping: $1 per tonne
South Korean Market Comments (3)

- USA at a disadvantage due to distance and value of USD
- Canada at a disadvantage due to shipping cost
- 2016 Q1: nine tenders totaling 368,000 tonnes
- 2016 All: likely similar to 2015, i.e. 1.5 mn tonnes
- Prices likely to stay low
- Demand forecast ~ 2.7 mn tonnes by 2020
Japan pellet imports – 2014 & 2015

Totals:
2014: 97,000 tonnes
2015: 197,000 tonnes

Thousands of tonnes

<table>
<thead>
<tr>
<th>Country</th>
<th>2014</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>Canada</td>
<td>91</td>
<td>124</td>
</tr>
<tr>
<td>China</td>
<td>0</td>
<td>51</td>
</tr>
<tr>
<td>Vietnam</td>
<td>2</td>
<td>21</td>
</tr>
<tr>
<td>United States</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>All others</td>
<td>4</td>
<td>1</td>
</tr>
</tbody>
</table>

Source: Global Trade Atlas (note: 2015 estimated as Nov YTD x 12 / 11)
Before Fukushima: nuclear was 29%, now 2%
Renewable energy was 1.2% now 1.6%, increase was mainly solar power
Interest in solar power is declining because the Japanese government wants more variety in the renewable energy mix.
The government wants to rapidly increase renewables by 2030 so that solar makes up about 15% and others (biomass and hydro) make up about 10%.
Biomass Energy Development (1)

- Supported by the Japanese Feed-in-Tariff Act 2011
- FIT levels are set annually
- FIT obligation to plant operator: 20 years
- FIT levels are higher for domestic forest residue (32-40 Yen/kWh) than for sawmill residue (24 Yen/kWh).
- There are about 1.45 million kW of approved projects, roughly equally 29 million tonnes of biomass annually in the pipeline. Not likely that all will get built.
2016 – 2017: 585 MW expected to be added.
2018 & beyond: 361 MW co-firing
Showa Shell (49 MW) – operational 2015, 100% biomass
Osaka Gas (110 MW) – operational 2015, 30% pellets
Sumitomo (50 MW) – operational 2018, 100% pellets
Distribution between local chips, PKS, and wood pellets is uncertain.
China

- No N.A. trade to date
- Commitment to reduce emissions from power sector by 60% by 2020 during COP21
- China's domestic demand for wood pellets is growing, largely in the east and in Guangdong province, where the local government has prohibited coal-fired boilers and the cost of pellets is lower than elsewhere in the country.
- Not an active market for N.A. producers
Korean market: volatile, not dependable.
Japanese buyers are more likely to enter long term contracts with NA producers (e.g. recent 10-year contract Sumitomo/Engie for 100kt/y)
Many new biomass plants set to come on line within 2 years
Mix between chips, PKS & pellet is still uncertain
Japan not likely to return to nuclear power
Good opportunity for wood pellets