Ontario Fuel Pellet Opportunities

Presentation for Ontario Ministry of Energy
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Wood Pellet Association of Canada
What are fuel pellets?

- Made from compressed wood fibre.
- Lignin binds the fibre. No adhesives needed.
- Used for residential/commercial heating and as a coal substitute for power generation
Main Industrial Use is Co-firing with Coal

- Lowest cost renewable power
- Relatively easy to implement:
  - Covered storage
  - Separate feed system
  - Separate milling
  - No change to remaining process
Residential and Commercial Heating

Explanatory sketch for a pellet burning system

1. Filling inlet to pellets storage
2. Pellets storage
3. Flexible auger
4. Chute to burner
5. Burner
6. Boiler
7. Chimney
CO2 Emissions of Various Fuels

Data: Biomass Energy Centre UK
Global Pellet Consumption 2011

Europe: 12.0 mn tonnes
Half heat, half power

EU 27, 84%
USA, 12%
Russia, 2%
SE Asia, 1%
Canada, 1%

Total: 14.4 mn tonnes

Source: Argus & Lammers et. al.
Canadian shipments to Europe in 2012

1.6 million tonnes

- UK – 51% (power)
- Netherlands – 24% (power)
- Belgium – 16% (power)
- Denmark – 2% (power)
- Italy – 6% (heat)
- Sweden 2% (power)
- Mostly long-term bilateral contracts, FOB and CIF

Wood Pellet Association of Canada
Canadian Pellet Plant Locations
## Canadian and Ontario Pellet Production Capacity

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Canadian Pellet Plants</strong></td>
<td>40</td>
</tr>
<tr>
<td><strong>Ontario Pellet Plants</strong></td>
<td>4</td>
</tr>
<tr>
<td><strong>Canadian Production Capacity</strong></td>
<td>3,000,000 tonnes</td>
</tr>
<tr>
<td><strong>Ontario Pellet Capacity</strong></td>
<td>50,000 tonnes or 1.5%</td>
</tr>
</tbody>
</table>
Ontario Home Heating Statistics

- 4.5 million households
- Average annual heat and hot water – 85 GJ/household
- 32% of households not using natural gas

<table>
<thead>
<tr>
<th>Heat Source</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Natural gas</td>
<td>68</td>
</tr>
<tr>
<td>Electricity</td>
<td>19</td>
</tr>
<tr>
<td>Oil</td>
<td>7</td>
</tr>
<tr>
<td>Wood</td>
<td>3</td>
</tr>
<tr>
<td>Propane</td>
<td>2</td>
</tr>
<tr>
<td>Other</td>
<td>1</td>
</tr>
</tbody>
</table>

Derived from Statistics Canada
## Fuel Cost Comparison

<table>
<thead>
<tr>
<th>Fuel</th>
<th>Heat Value</th>
<th>Unit Cost</th>
<th>Efficiency</th>
<th>$/GJ</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heating Oil</td>
<td>0.037GJ/litre</td>
<td>$1.22/litre</td>
<td>80%</td>
<td>$41.22</td>
</tr>
<tr>
<td>Electricity</td>
<td>3.6GJ/MWh</td>
<td>$123/MWh</td>
<td>100%</td>
<td>$34.17</td>
</tr>
<tr>
<td>Wood Pellets</td>
<td>17.5GJ/tonne</td>
<td>$270/tonne</td>
<td>80%</td>
<td>$19.29</td>
</tr>
<tr>
<td>Natural Gas</td>
<td>0.037GJ/m3</td>
<td>$0.30/m3</td>
<td>80%</td>
<td>$10.14</td>
</tr>
</tbody>
</table>
Pellet Heating Potential

- Average annual home heat and hot water = 85 GJ
- 85 GJ = 6.25 tonnes of wood pellets
- Pellet potential
  - 32% of homes do not use gas
  - 32% of 4.5 million homes times 6.25 tonnes of pellets
  - Totals 9 million tonnes of pellets annually
## Converting Non-Gas Households to Pellets

<table>
<thead>
<tr>
<th>Conversion Target</th>
<th>Annual Pellets</th>
<th>Pellet Value</th>
<th>Pellet Jobs*</th>
</tr>
</thead>
<tbody>
<tr>
<td>100%</td>
<td>9 million tonnes</td>
<td>$2.4 billion</td>
<td>90,000</td>
</tr>
<tr>
<td>10%</td>
<td>900,000 tonnes</td>
<td>$240 million</td>
<td>9,000</td>
</tr>
<tr>
<td>1%</td>
<td>90,000 tonnes</td>
<td>$24 million</td>
<td>900</td>
</tr>
</tbody>
</table>

*Assume 0.35 direct pellet manufacturing jobs per 1,000 tonnes and 0.65 indirect jobs in distribution, stove installation, sales etc.
Benefits

- GHG savings
- Reach renewable energy targets
- Rural jobs – revive forest industry
- Keep jobs in Ontario instead of exporting dollars to Western Canada for fossil fuels
- Reduce home heating costs for Ontario households
Incentives?

- Ontario has a Home Energy Savings Program for Natural Gas Heating Appliances
- Ontario has feed-in-tariffs for small scale renewable electricity but not heat
- Ontario needs a similar incentive for fuel pellet heat conversions as well as a public education program
For more information

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