Wood chips and pellets utilization tendency in bioenergy production in Finland, Sweden and some other European countries 2000-2016

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Content:

- Total Energy use
- Forest chips
- Solid wood fuel
- Pellets
- Energy Peat
- Conclusions
Total energy use in Finland (source: Statistics Finland)

- Renewables: 32%
- Peat: 5%
- Nuclear: 18%
- Fossil fuels: 40%
- Other: 5%

Source: Statistics Finland
Energy prices in Finland (source: Statistics Finland)
Use of forest chips in Finland

Source: Luke

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Anttila et al.
• In EU-area Finland and Sweden are the biggest users of Forest chips.
• In Sweden the use of forest chips was around 7 million cubic meters in 2014
• In Sweden the same problems occurs than in Finland, price of coal…
• Competitiveness of forest chips has to increase, that use of forest chips can continue increasing
• The raw material base is different between Finland and Sweden
Solid wood fuel consumption in heating and power plants in Finland and Sweden

Source: Luke, & Skogforsk
Use of Pellets in Finland

![Bar chart showing domestic production and consumption of pellets from 2001 to 2016.](chart_image)

- **Domestic production**
- **Domestic consumption**

**Axes:**
- **Y-axis:** 1000 t
- **X-axis:** Years from 2001 to 2016

**Key Notes:**
- Production and consumption data for pellets in Finland from 2001 to 2016.
- The chart indicates an increasing trend in both production and consumption over the years.
• With a consumption of about 17.5 million tonnes of pellets in 2013, the EU is already the world’s largest wood pellets market.
• The EU-28 is the large global producer of wood pellets; 13.3 million tonnes in 2014.
• It is also a net importer of wood pellets import from non-EU Member States was 6.55 million tonnes.
• Germany produced 2.4 million tonnes of pellets 2014, and Sweden 1.4 million tonnes.

<table>
<thead>
<tr>
<th>Main pellet producers</th>
<th>Million tonnes</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
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<tbody>
<tr>
<td></td>
<td>2009</td>
<td>2010</td>
<td>2011</td>
<td>2012</td>
<td>2013</td>
<td>2014*</td>
</tr>
<tr>
<td>Germany</td>
<td>1.6</td>
<td>1.8</td>
<td>1.9</td>
<td>2.2</td>
<td>2.3</td>
<td>2.4</td>
</tr>
<tr>
<td>Sweden</td>
<td>1.6</td>
<td>1.7</td>
<td>1.3</td>
<td>1.3</td>
<td>1.4</td>
<td>1.4</td>
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<tr>
<td>France</td>
<td>0.3</td>
<td>0.5</td>
<td>0.5</td>
<td>0.7</td>
<td>0.9</td>
<td>1.2</td>
</tr>
<tr>
<td>Latvia</td>
<td>0.5</td>
<td>0.6</td>
<td>0.7</td>
<td>1.0</td>
<td>1.0</td>
<td>1.0</td>
</tr>
<tr>
<td>Austria</td>
<td>0.7</td>
<td>0.9</td>
<td>0.9</td>
<td>0.9</td>
<td>0.9</td>
<td>0.9</td>
</tr>
<tr>
<td>Portugal</td>
<td>0.3</td>
<td>0.6</td>
<td>0.7</td>
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<td>0.7</td>
<td>0.7</td>
</tr>
<tr>
<td>Poland</td>
<td>0.4</td>
<td>0.5</td>
<td>0.6</td>
<td>0.6</td>
<td>0.6</td>
<td>0.6</td>
</tr>
</tbody>
</table>

* Estimation

• Production capacity of eastern European pellet industry is raising by almost 2 million tonnes per year by the beginning of next year.
The United Kingdom had the highest level of wood pellet imports.
Imported pellets to EU-28 comes mainly from North America.

### Main pellet consumers

<table>
<thead>
<tr>
<th></th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014*</th>
</tr>
</thead>
<tbody>
<tr>
<td>UK</td>
<td>0.2</td>
<td>0.176</td>
<td>1</td>
<td>1.4</td>
<td>3.8</td>
<td>5</td>
</tr>
<tr>
<td>Italy</td>
<td>0.85</td>
<td>0.58</td>
<td>1.5</td>
<td>2.1</td>
<td>2.5</td>
<td>2.6</td>
</tr>
<tr>
<td>Denmark</td>
<td>1.4</td>
<td>1.6</td>
<td>1.6</td>
<td>1.6</td>
<td>2.3</td>
<td>2.4</td>
</tr>
<tr>
<td>Germany</td>
<td>1.1</td>
<td>1.2</td>
<td>1.4</td>
<td>1.7</td>
<td>2</td>
<td>2.2</td>
</tr>
<tr>
<td>Sweden</td>
<td>1.92</td>
<td>2.28</td>
<td>1.88</td>
<td>1.7</td>
<td>1.9</td>
<td>2</td>
</tr>
<tr>
<td>France</td>
<td>0.3</td>
<td>0.4</td>
<td>0.55</td>
<td>0.6</td>
<td>0.89</td>
<td>1.1</td>
</tr>
<tr>
<td>Austria</td>
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<td>0.66</td>
<td>0.72</td>
<td>0.785</td>
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<tr>
<td>Belgium</td>
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<td>1.2</td>
<td>1.7</td>
<td>0.8</td>
<td>0.5</td>
</tr>
<tr>
<td>Netherlands</td>
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<td>0.913</td>
<td>1</td>
<td>1.25</td>
<td>0.5</td>
<td>0.5</td>
</tr>
</tbody>
</table>

* Estimation

Source: AEBIOM, GTIS, Luke
International production of energy peat 2013


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Energy peat in Finland

![Graph showing production and consumption of energy peat in Finland from 2009 to 2015.](image)

Source: Luke & Bioenergia Ry

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Conclusions:

• Finnish targets (2020) to use of renewables will be achieved, use of industrial by-products will increase
• In Finland the target of using forest chips has been set to 25 TWh = 13.5milj.m³ wood
• It is possible to achieve, we have enough potential, but..
• The price competitiveness of forest chips will be the determining issue of utilization level
  - efficiency in supply chains has to improved
  - quality issues should be addressed
• Use of pellets will increase in Finland
• Growing stock volume in European countries are increasing
Kiitos!