NOFOBE and NB-NORD Meeting

Heikki Pajuoha
Metsäteho Oy
14 - 16 June 2017
Lappeenranta
Biorefineries using wood-based raw material

Capacity, t/y

- 500 000 – 1 300 000 (9)
- 200 000 – 500 000 (10)
- 0 – 200 000 (14)

Completed (19)
Under construction (3)
Under planning (7)
Preliminary study (5)

SOURCE: Finnish Forest Industries Federation
Paper-, paperboard- and pulp mills in Finland

- Paper mills: 20
- Paperboard mills: 13
- Pulp mills: 19

SOURCE: Finnish Forest Industries Federation
Forest industry production plants in Finland

- Paper mills (20)
- Paperboard mills (13)
- Pulp mills (19)
- Paper and paperboard converting mills (18)
- Sawmills* (35)
- Plywood, particle board, fibreboard and veneer mills (10)
- Furniture and joinery industry (48)

SOURCE: Finnish Forest Industries Federation; *FFIF members' sawmills, **Member companies of the Association of Finnish Joinery and Furniture Industries
Megatrends in the forest industry

1. Digitalisation
2. Population growth
3. Ageing population
4. Urbanisation
5. Developing nations
6. Scarcity of natural resources
7. Declining fossil fuel supply
8. Environmental consciousness
9. Climate change
10. Localisation
11. Globalisation

Consumption choices and demand
- Cardboard & packaging
- Fibre pulp
- Bioenergy
- Wood constructs
- Renewability
- Production and logistical efficiency
- Sustainability
- Tissue & paper
- New bio-products
- Bio-oil
- Carbon sequestration
- Raw material efficiency
- Cost-efficiency
- Energy efficiency

Bioeconomy as part of the strategy of the Finnish forest industry

Basis of the bioeconomy:
Forest resources, production plants, infrastructure, know-how, research and development
## Development prospects of Finland’s forest industry production up until year 2025 and its impact on wood supply

<table>
<thead>
<tr>
<th>Field of production</th>
<th>Direction</th>
<th>Special characteristics</th>
<th>Impact on wood supply</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pulp and other bio-products</td>
<td>• Long-fibre softwood pulp as main product  &lt;br&gt; • Large biorefinery and specialised small plants</td>
<td></td>
<td>• Expected increase in the use of softwood fibre</td>
</tr>
<tr>
<td>Paper</td>
<td>• Decreasing printing and writing paper production  &lt;br&gt; Diversifying tissuepaper production</td>
<td></td>
<td>• Small-size spruce (fibres) released for the production of pulp</td>
</tr>
<tr>
<td>Cardboard</td>
<td>• High-quality packaging cardboards  &lt;br&gt; • Paper machines converted to cardboard machines</td>
<td></td>
<td>• Small-size birch (fibre) required</td>
</tr>
<tr>
<td>Wood products</td>
<td>• Tightening of customer demands  &lt;br&gt; • Increasing wood construction, concepthing  &lt;br&gt; • A profitable saw industry is the prerequisite for increasing pulp production!</td>
<td></td>
<td>• Quality management  &lt;br&gt; • Raw material and capital efficiency  &lt;br&gt; • Precision delivery</td>
</tr>
<tr>
<td>Bioenergy</td>
<td>• Production of transport fuels is growing  &lt;br&gt; • Political decisions will determine the competitiveness of wood chip production</td>
<td></td>
<td>• Logistical solutions  &lt;br&gt; • Condensing the energy content</td>
</tr>
</tbody>
</table>
## Success factors of wood supply

<table>
<thead>
<tr>
<th>Factors of production</th>
<th>Critical success factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wood</td>
<td>• Logging potential&lt;br&gt;• Functionality of the forest product market&lt;br&gt;• Raw material efficiency</td>
</tr>
<tr>
<td>Entrepreneurs, employers and machine stock</td>
<td>• Availability and know-how&lt;br&gt;• Productivity</td>
</tr>
<tr>
<td>Capital</td>
<td>• Capital efficiency&lt;br&gt;• Cost-efficiency</td>
</tr>
<tr>
<td>Energy</td>
<td>• Energy efficiency</td>
</tr>
<tr>
<td>Knowledge/know-how</td>
<td>• Knowledge management</td>
</tr>
<tr>
<td>Operational environment</td>
<td>• Mill infrastructure (interface with wood supply)&lt;br&gt;• Transport infrastructure&lt;br&gt;• Knowledge infrastructure&lt;br&gt;• Regulation&lt;br&gt;• Supporting policies&lt;br&gt;• R&amp;D structure (regeneration)</td>
</tr>
</tbody>
</table>
Efficient Wood Supply 2025 vision, targets and R&D focus:

**VISION**

Focus on the efficiency and strategic planning of wood supply improves the competitiveness of the forest industry and guarantees its growth and regeneration potential.

### Targets
- Structure and leadership reforms
- Profitable wood production
- Well-functioning forest product market
- Improving forest product logistics
- Digitalisation

### R&D Focus Areas
<table>
<thead>
<tr>
<th>Increasing wood production</th>
<th>Growing stock and condition information</th>
<th>Standards</th>
<th>Online service portal</th>
<th>Capital efficiency</th>
<th>Entrepreneurship</th>
<th>Value chains</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost-efficient forest management</td>
<td>Big Data</td>
<td>Electronic learning environments</td>
<td>Wood supply to market</td>
<td>Raw material efficiency and allocation</td>
<td>Logging and transport control</td>
<td>Energy wood production chains</td>
</tr>
<tr>
<td>Mechanisation of forest management</td>
<td>Decision supporting systems</td>
<td>Automation and robotics</td>
<td>Pricing and measurement methods</td>
<td>Logistics solutions</td>
<td>Logging and transport technology</td>
<td>Transportation infrastructure</td>
</tr>
</tbody>
</table>

Consumer demand and endurance management

14.6.2017
• Vision: Efficient Wood Supply 2025