The European Market for Woody Biomass
Supply and Demand Drivers and Trends

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Indufor was founded in 1980
Independent staff owned
Advisory services in forest and forest industry development
Private and public sector clients
Located in:
- Helsinki, Finland
- Auckland, New Zealand
- Melbourne, Australia
- Washington DC, USA
Contents

1. Europe’s Role in Global Biomass Markets
2. Demand and Supply Drivers
3. Changing Policies
4. Sustainability as a Business Driver
5. Take-home Messages
Europe is a deficit area of woody biomass – is this still an opportunity for the US and other woody biomass exporters?

- Europe produces over 300 million m³ of wood while the annual increment of growing stock is 315 million m³
- Europe consumes 230 million m³ of industrial wood of which 70 million m³ is imported
- About 250 million m³ of wood is used as energy - about half of it is result of industrial processes while the rest is collected from the forests and imported
- The growing need of biomass for energy production has created a significant opportunity for wood biomass producers and exporters such as the US
- Pellet production and exporting has been the main woody biomass trade satisfying European demand and accelerated the American pellet production

- Is the business concept sustainable? Do the European consumers have sufficient capacity to pay competitive prices of woody biomass in the future? What are the real drivers of this business?
Wood flows in Europe (EU27)

Annual increment in growing stock: 315 Mm³
Stock: 25,717 Mm³
Natural drain: 37.1 Mm³
Firewood: 82.1 Mm³
Forest chips for heat and power production: 29.2 Mm³
Export of wood residues: 7.0 Mm³
Import of round wood & chips: 68.5 Mm³
Export of round wood: 35.1 Mm³

Domestic round wood for industry: 233.3 Mm³
Sawn timber: 97.7 Mm³
Solid biofuels in sawmill industry: 35.8 Mm³

Wood industry: 53.0 Mm³
Chips: 3.2 Mm³
Sawdust and chips: 109.4 Mm³

Solid biofuels in plywood industry: 1.6 Mm³
Fibre and particle board: 51.5 Mm³
Recovered paper: 79.3 Mm³

Solid biofuels in board industry: 7.7 Mm³
Solid biofuels in chemical pulp industry: 9.9 Mm³
Mechanical and semimechanical pulp industry: 30.6 Mm³

Chemical pulp industry: 66.1 Mm³
Solid biofuels in mechanical pulp industry: 4.5 Mm³

Black liquor: 66.1 Mm³
Energy use 246 Mm³

Janne Keränen & Eija Alakangas, 2013

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World pellet production/consumption in 2013 (million of tonnes)

Source: AEBIOM European Bioenergy Outlook 2014
Top net exporters in 2014 (tonnes)

Source: AEBIOM European Bioenergy Outlook 2014
Estimated world wood pellet production (millions of tonnes)

- EU28 is the biggest producer => 50% of the world pellet production

Source: AEBIOM European Bioenergy Outlook 2014
World wood pellet demand in 2013 (1 000 tonnes)

• EU28 is the biggest consumer => 75% of the world pellet consumption

World demand in 2014
• 20 Million tonnes in EU
• 7 Million tonnes rest of World
• 27 Million tonnes total

Source: AEBIOM European Bioenergy Outlook 2014
European wood pellet production in 2013

Source: AEBIOM European Bioenergy Outlook 2014
Trend of wood pellet production (2007-2013) in 6 biggest EU producers (tonnes)

Source: AEBIOM European Bioenergy Outlook 2014
Top ten wood pellet consuming countries by end-use in 2013 (millions of tonnes)

Source: AEBIOM European Bioenergy Outlook 2014
Supply and Consumption of Industrial By-Products (excl. Bark) in the EU27 (2010)
Production, consumption and production capacity of wood pellets in EU27
Bioenergy related wood chip trade in the Europe
Major global wood pellet trade routes (2013)
Major external wood pellet import routes to EU (2013)
1. Europe’s Role in Global Biomass Markets

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3. Changing Policies

4. Sustainability as a Business Driver

5. Take-home Messages
Supply drivers for European woody biomass

- Land use competition
- Migration
- Degradation
- Technology
- Policies
- Climate change
- Reforestation
- Industrial Infrastructure
Demand drivers for European use of woody biomass

- Consumer preferences
- GDP Growth/Demography
- Substitution
- Policies
- Material shift
- Green building
- Changes in global markets
- Bioenergy/bio solutions
- Eco-system services
- Consumer preferences
- GDP Growth/Demography
- Substitution
- Policies
- Material shift
- Green building
- Changes in global markets
- Bioenergy/bio solutions
- Eco-system services
Nature of the key drivers

Supply drivers:
- Policies
- Industrial infrastructure

Still potential to increase supply due to industrial infrastructure

Demand drivers
- Policies
- Consumer preferences
- Substitution
- Material shift/cascade use
- Green building
- Bioenergy and bio solution

Efficiency and sustainability are more important than volume growth in demand
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European policies from 2005 onwards after agreement of 2020 targets

- The 2020 targets were agreed mainly in 2005
- This resulted in a wide variety of national application – subsidies, tax reliefs and regulations
- The policy instruments are targeted to impact:
  - Wood and biomass harvesting and sales
  - Logistics
  - Industrial processes and energy production
  - Consumption

Complicated and challenging to assess the final combined impacts
European policies in 2015

- The continuation of recession has changed the energy policies and application of national policies
- Subsidies are a prerequisite for competitive woody biomass production and use for energy generation
- The subsidies have been criticized and reduced in many countries
Policies and their implications in 2015 and after in selected European pellet consumer countries

<table>
<thead>
<tr>
<th>Country</th>
<th>Policies and their impacts</th>
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<tbody>
<tr>
<td><strong>Main pellet importers</strong></td>
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</tbody>
</table>
| UK           | • Aim to increase pellet consumption from current 5 to 8.4 – 16.8 million tonnes by 2020  
• No money in 2015 in the CFD (Contract for Difference) allocation (= one subsidy system)  
• EU investigating: potential state aid “overcompensation” – i.e. too much subsidies for biomass based energy production  
• Serious uncertainties for the future (slide 27)                                                                                                                                                                                   |
| Belgium      | • Aim to increase pellet consumption from current 1.4 to 3 million tonnes by 2020  
• Step backward of the regulator on green certificate in 2014  
• 2 new plants in the pipe (BEE & Antwerp Biopower)  
• Overcapacity in production  
• Drop of sales of boilers and stoves                                                                                                                                                                                             |
| Netherlands  | • Aim to increase pellet consumption from current 1.2 to 3,5 million tonnes by 2018  
• Government has finally voted the CFD subsidy  
• Uncertainties on subsidy allocation.                                                                                                                                                                                            |
| Denmark      | • Aim to increase pellet consumption from current 2 million to 3.5 millions tonnes by 2018-2020  
• No subsidy but CO₂ tax                                                                                                                                                                                                           |
## Policies and their implications in 2015 and after in selected European pellet producer countries

<table>
<thead>
<tr>
<th>Country</th>
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<tbody>
<tr>
<td>Sweden</td>
<td>• Decline in pellet production/consumption in 2010-2012</td>
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<td>• Existing CO₂ tax which supports the pellet sector</td>
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<td>• High potential in mid-scale market</td>
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<td>Spain</td>
<td>• Increase in production capacity</td>
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<td></td>
<td>• Strong growth in consumption 100 000 in 2010 to &gt; 400 000 tonnes in 2015</td>
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<td></td>
<td>• Increasing market of Mediterranean solid biofuels</td>
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<tr>
<td>Germany</td>
<td>• Production of pellets decreased in 2014 (2.1 million tonnes)</td>
</tr>
<tr>
<td></td>
<td>• Consumption of pellets decreased of 200 000 tonnes in 2014</td>
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</tbody>
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**CFD Contract for difference**
Feed-in Tariffs with Contracts for Difference (CfDs) – long-term contracts which provide revenue certainty to investors

**RO Renewable obligation**
The RO places an obligation on licensed electricity suppliers in the United Kingdom to source an increasing proportion of electricity from renewable sources

**LEC Levy Exemption Certificates**
The Climate Change Levy (CCL) is a tax on UK business energy use, charged at the time of supply. The final recipient of supplies of electricity generated from certain renewable sources and combined heat and power (CHP) enjoy tax exemptions. The proof of these tax exemptions are LECs. That are issued LECs to producers based on renewable energy production.
Case UK

- U.K. government announced stop issuing Climate Change Levy Exemption Certificates (LEC) August 1, 2015
- The discontinuation of the LEC represents a less than 8% reduction in total incentives and therefore the short term effect to pellet demand is expected to be minimal
- On July 22, the government announced that it would remove the guaranteed level of subsidy for biomass conversions and co-firing projects for the remainder of the RO, a move estimated to save the government £500 per year in 2020/21
- In long term these kind of policy changes create mistrust among investors and private industry lowering the pellet consumption.
1. Europe’s Role in Global Biomass Markets
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5. Take-home Messages
### Stakeholder interest and trends in European perception of sustainability

<table>
<thead>
<tr>
<th>Stakeholder interest</th>
<th>State</th>
<th>NGOs</th>
<th>Consumers</th>
<th>Investors</th>
<th>Companies</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sustainable resource use; resource efficiency; emissions; transparency</strong></td>
<td><em>Forestry &amp; bioenergy identified as high risk sectors</em></td>
<td><em>Product life cycle; responsible consumption; confusing amount of environmental information</em></td>
<td><em>Quantification of financial impacts of environmental and social risks</em></td>
<td><em>From risk assessment into identifying new business opportunities; sustainable restructuring</em></td>
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<tr>
<td><strong>Non-financial information disclosure; single market for green products</strong></td>
<td><em>Partnerships to transform business; natural capital approach</em></td>
<td><em>Ecoefficiency; lifecycle management; reuse; sense of community; local production and economy</em></td>
<td><em>Increasing information disclosure; quantification of financial impacts of environmental and social factors</em></td>
<td><em>Integration of CR into core strategy; integrated reporting; new operational models and products</em></td>
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<td><strong>Trends</strong></td>
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Sustainability as a key driver for woody biomass sourcing

- Climate change mitigation, going from fossil fuels and materials to renewables and overall sustainability are the main drivers of European energy policies
- Woody biomass imports are criticized not being sustainably sourced
- Woody biomass is urged to be certified in Europe (FSC or PEFC preferred)
- The development of a sustainability standard for solid biofuels has been slow
- Seven big energy producers have joined forces and lobby for FSC forest certification among the US producers
- The Netherlands has developed its own national standard: The Netherlands sustainability criteria for solid biomass (2015). It has been produced by energy producers and NGOs together.
Map of FSC forest certification in Europe

[Map showing the distribution of certification in Europe with different color codes for percentage ranges]
Map of FSC forest certification in the US
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1. Europe’s Role in Global Biomass Markets
2. Demand and Supply Drivers
3. Changing Policies
4. Sustainability as a Business Driver
5. Take-home Messages
Take-home Messages

- Woody biomass imports to Europe are driven by European energy policies that are changing – the recent policies might have negative impacts on imports (price and volumes)
- European woody biomass volumes are produced and consumed more and more efficiently thanks to material shift and industrial infrastructure in Europe
- US exports of pellets are threatened by increasing sustainability requirements and European wood paying capacity
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