The JRC Biomass Assessment Study

Forest-based sector outlook related work

Ragnar Jonsson
Bioeconomy Unit (D.1)
Sustainable Resources Directorate
2012 EU Bioeconomy Strategy*

**Action No 9:** [...] improve the understanding of current and future availability and demand of biomass across sectors [...] for the development and review of relevant policies]

* Reviewed, updated last year
The biomass mandate

- JRC tasked with providing - on a long-term basis – data and analysis of EU and global biomass supply, demand, and related impacts

- Assessment of current situation, as well as forward looking analysis (2020-2030-2050)

- Covering all sources and uses of biomass

- Approved in 2015 by 12 policy DGs at Directors level: RTD, SG, AGRI, CLIMA, DEVCO, ENER, ENV, GROW, MARE, MOVE, REGIO and TRADE
Building blocks 1 and 2: review, reference database, bio-physical supply assessment

Block 1 - review of literature and existing datasets

Taking stock of recent studies and available datasets on biomass supply, uses, flow, prices and costs

- Taking stock of existing knowledge
- Reference database (‘best possible data’)
- Bio-physical resource assessment

Block 2 - Assessment of current biomass supply and potential

Bio-physical assessment of current EU and global biomass availability and potentials; setting up of reference databases

- Forestry
- Agriculture
- Fisheries and aquaculture
- Algae
- Waste

Harmonising datasets

European Commission
Building blocks 3 and 4: Biomass balances, supply chains, impacts

Analysis of current EU and global biomass balances and supply chains: biomass flows, cost analysis, impact assessments (provision & use of biomass)

Wood resource balance sheets

<table>
<thead>
<tr>
<th>Wood supply</th>
<th>1000m³</th>
<th>%</th>
<th>1000m³</th>
<th>Material use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Domestic removals (o.b.)</td>
<td>74,401</td>
<td>55.4%</td>
<td>62.4%</td>
<td>83,835</td>
</tr>
<tr>
<td>Net-trade primary wood (o.b) *</td>
<td>7,754</td>
<td>5.8%</td>
<td>37.6%</td>
<td>50,514</td>
</tr>
<tr>
<td>By- and co-products supply **</td>
<td>38,384</td>
<td>28.6%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wood pellets supply</td>
<td>4,838</td>
<td>3.6%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Post-consumer wood</td>
<td>1,839</td>
<td>1.4%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unaccounted sources</td>
<td>7,134</td>
<td>5.3%</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total sources</strong></td>
<td>134,350</td>
<td></td>
<td>134,350</td>
<td></td>
</tr>
</tbody>
</table>

Overall Biomass flows

<table>
<thead>
<tr>
<th>Imports</th>
<th>Supplies</th>
<th>Uses</th>
<th>Exports</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fisheries</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Forestry</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Environmental impacts

Supply chains pathways definition
Environmental impact assessment
Database of LCIA results
Input values
Pathways definition
Methodology for environmental (and economic) impact assessment
Advanced life cycle assessment
Life cycle Impact Assessment (LCIA)
Inventory accounting
Environmental impact assessment indicators for each scenario

Socio-economic dimensions to be addressed
Building block 5: Modelling and future prospects

Prospective analysis of future biomass supply and demand and their respective impacts.

Time horizons 2020-2030-2050
Carbon Budget Model of the Canadian Forest Sector (CBM-CFS)

http://midas.jrc.cec.eu.int/discovery/midas/#showmetadata/model/76

- CBM adapted to European forest conditions, tested and validated by the JRC. It is currently applied to 26 EU member states, both at country and NUTS2 level.

- Simulates stand- and landscape-level carbon dynamics, under different management scenarios and natural disturbances (fires, storms)

- CBM is used to support DG CLIMA in the verification of Member States GHG inventories
Global Forest Trade Model (GFTM)

- JRC equilibrium model of the global forest-based sector. Model outcomes regarding consumption, production and trade of wood-based products.
- Covers 48 countries and regions of the world. EU member states, most other European countries, and all major producers and/or consumers of wood-based products modelled individually, while some non-major producer or consumer countries are aggregated into global sub-regions.

http://midas.jrc.cec.eu.int/discovery/midas/#showmetadata/model/135
CBM-GFTM linkage

1. For a given EU ms and outlook period, CBM estimates maximum IRW harvest potentials (coniferous and non-coniferous), given constant standing carbon stocks.

2. Potentials ingested by GFTM as bounds for the domestic provision* of coniferous and non-coniferous IRW, used in the production of wood-based commodities in the countries in question.

3. After reaching a market equilibrium, GFTM subsequently provides the demand for wood raw material to CBM, which uses this “actual harvest” of IRW to model forest resource development, and for the computation of the next period’s harvest potential.

   And so the process continues for the following periods.

* Also accounting for trade in IRW
Studies based on linking CBM-GFTM (1)


- **Synergies:** sawmilling benefits from increased demand for sawdust and wood chips, within as well as outside EU (most pronounced in major wood pellets manufacturing countries)

- **Competition:** wood-based panels and most paper grades suffer from increased competition for raw materials, within as well as outside EU (again most pronounced in major wood pellets manufacturing countries)

- Some crowding out of wood pellets consumption outside the EU - EU net imports of wood pellets grow drastically
Studies based on linking CBM-GFTM (2)*


- **BaU/reference** scenario: EU harvests by 2030 7% higher than the average for 2000-2012. Annual forest carbon sequestration reduces by 10%.

- **HM** (high mobilization scenario) - (i) full utilization of wood supply potential; (ii) a doubling of EU wood pellets consumption between 2015 and 2030:
  
  *EU harvests 55% higher compared to the BaU scenario by 2030. Fuelwood accounts for this increase – competition effects of increased wood pellets consumption balance synergies for material uses of wood. Forest carbon sequestration would be 83% lower by 2030 than the average for 2000-2012.*

* N.B: These studies do not constitute official output of the JRC Biomass Assessment Study!
Thanks for your attention!

Thanks!