WOOD RECYCLING MITIGATES CLIMATE CHANGE

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European Panel Federation
Wood recycling mitigates climate change

- Introduction: wood & wood-based panels
- Indicators for sustainable management of resources & respect for the carbon cycle
- EU energy policy impact study 2000
- Impact on the woodworking industries
- Conclusions and recommendations
The wood-based panels industry respects the carbon cycle.
The EU woodworking industry

- **The EWWI (EU25):**
  - Two million employees
  - 140,000 companies,
  - 165 billion EUR/year turnover

- **Pioneer in sustainable use of resources**
  - Process heating (up to 70% of needs) and CHP with wood biomass unsuitable for recycling
  - Supporting sustainable forest management
  - Continuously improving recycling rates

EPF
European Panel Federation in 2004

Members in 22 countries

- Particleboard 34 million m³
- MDF 11.9 million m³
- OSB 2.8 million m³
Wood-based Panels in Europe* 2004

- Particle-board: 65%
- Plywood: 6%
- OSB: 5%
- Hard/Soft-board: 4%
- MDF: 20%

Total 58.7 million m³ (+5.6%)

*excluding Russia
Consumption Wood-based Panels in Europe

(million m³)

- Plywood
- OSB
- MDF
- Particle board

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Carbon sequestration

Wood

- Sawn timber
- Softwood plywood
- Birch plywood
- LVL
- Particleboard
- Hardboard
- Softboard
- Gypsum board
- Limestone bricks
- Red bricks
- Standard concrete
- Special core elements
- Hollow-core elements
- Steel plates and rolls
- Steel I-beams
- Steel pipe beams

Minerals

- Metal
- Aluminum façade element

Metal

- Concrete
- Steel
- Aluminum

Values in t CO₂ per m³ of product

EPF
**Embodied energy** (Lawson, 1996)

<table>
<thead>
<tr>
<th>Material</th>
<th>Embodied Energy (MJ/kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kiln dried sawn softwood</td>
<td>3.4</td>
</tr>
<tr>
<td>Kiln dried sawn hardwood</td>
<td>2.0</td>
</tr>
<tr>
<td>Air dried sawn hardwood</td>
<td>0.5</td>
</tr>
<tr>
<td>Particleboard</td>
<td>8.0</td>
</tr>
<tr>
<td>Medium Density Fibreboard (MDF)</td>
<td>11.3</td>
</tr>
<tr>
<td>Plywood</td>
<td>10.4</td>
</tr>
<tr>
<td>Glued-laminated timber</td>
<td>11.0</td>
</tr>
<tr>
<td>Laminated veneer timber</td>
<td>11.0</td>
</tr>
<tr>
<td>Plastics (general)</td>
<td>90.0</td>
</tr>
<tr>
<td>PVC</td>
<td>80.0</td>
</tr>
<tr>
<td>Acrylic Paint</td>
<td>61.5</td>
</tr>
<tr>
<td>Glass</td>
<td>12.7</td>
</tr>
<tr>
<td>Mild steel</td>
<td>34.0</td>
</tr>
<tr>
<td>Galvanised mild steel</td>
<td>38.0</td>
</tr>
<tr>
<td>Aluminium</td>
<td>170.0</td>
</tr>
<tr>
<td>Copper</td>
<td>100.0</td>
</tr>
<tr>
<td>Zinc</td>
<td>51.0</td>
</tr>
</tbody>
</table>
Share of Renewable Energy of Total Energy Use in Selected Building Materials

Source: Building Information Foundation RTS
Wood frame buildings have a lower environmental impact than buildings made of competing materials.

Environmental impact relative to a typical wood frame home:

- Embodied energy
- Global warming potential
- Air toxicity
- Water toxicity
- Weighted resource use
- Solid waste

Source: Indufor
Using wood to tackle climate change

European Commission writes (March 2003):

- Wood plays a major role in combating climate change
- Greater use of wood products will
  - stimulate the expansion of Europe’s forests, and
  - reduce greenhouse gas emissions,
  - by substituting for fossil fuel intensive products
- The Commission is examining ways to encourage these trends
EC WG Climate Change Recommendations

- Replace fossil fuels and energy intensive materials with sustainably produced wood products
- Incentives and subsidies to increase the use of wood products on the model of subsidies granted for the use of wood as fuel
- Incentives to increase wood collecting, sorting and recycling
EC WG Climate Change Recommendations (2)

- Fiscal incentives such as reduced VAT for wood products from sustainably managed forests
- Market incentives such as public procurement clauses to encourage the use of wood products such as minimum wood content in public buildings
- Raising awareness on the role of wood products for fighting Climate Change
Particleboard Wood Demand 2002-2006

x 1,000 dry tonnes under bark within selected countries
Particleboard Raw Wood Mix 2004

- Chips: 53.3%
- Recovered & other wood: 15.0%
- Roundwood: 24.5%
- Sawdust: 7.2%

% dry tonnes under bark within selected countries
ROOM for MANEUVER?

Net annual increment  Fellings

(Mm³/y – source: STORA ENSO)
Expected RES progress in EU-15

Yearly RES primary energy

1990 - 2000: Eurostat data
2001 - 2010: Estimation

MT o e

B I O M A S S
H Y D R O
W I N D
S O L A R C O L L E C T O R S
P V
G E O T H E R M A L

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EU energy policy impact study 2000

- 1997: White Paper on renewable energy
- Target WP: double the contribution of renewable energy by 2010;
- Biomass, mainly wood, to triple its contribution
- => Scenario analysis:
  - White Paper
  - Business as Usual
  - Foresters
  - Minimum Pain
### Estimated wood price change 1996-2010

<table>
<thead>
<tr>
<th>Supply/scenario</th>
<th>Low wood supply  (inelastic)</th>
<th>High wood supply (elastic)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Business as usual</td>
<td>+ 18%</td>
<td>-</td>
</tr>
<tr>
<td>White Paper</td>
<td></td>
<td></td>
</tr>
<tr>
<td>= Additional 163 Mio m³ for energy</td>
<td>+ 75%</td>
<td>+ 39%</td>
</tr>
<tr>
<td>Foresters</td>
<td></td>
<td></td>
</tr>
<tr>
<td>= Higher price, new raw materials</td>
<td>+ 49%</td>
<td>+ 29%</td>
</tr>
<tr>
<td>Minimum Pain</td>
<td></td>
<td></td>
</tr>
<tr>
<td>= More industrial and post-consumer residues</td>
<td>+ 26%</td>
<td>+ 18%</td>
</tr>
</tbody>
</table>
The industry “will hardly, if at all” be able to absorb the shift which will be induced by the White Paper “without detrimental effects”

“A reduced target for wood could be compensated by increased targets for other bio-fuels”
Sustainable resource management ??

- The value chain of the wood resource is presently not respected:
  
  => material suitable for the production of wood-based products, is used directly for energy generation

- The energy market is not governed by free market principles:
  
  => unbalanced financial energy support
Impact on woodworking industries, as observed by mid 2004

- Increasing shortage of wood raw material for the wood-based panel industry
- Growing use of other materials and products which are:
  - not renewable
  - sometimes recyclable and
  - always less energy-efficient
- Increasing pressure on the forest resource
Cost evolution wood raw material

Overall wood cost development in % 1995-2004

EPF
Recognizing the economic value chain

**VALUE ADDED**

**Pulp and Paper Industry**
- Forestry → Pulping
- Pulping → Paper-making
- Paper-making → Printing & publishing
- Printing & publishing → Retail/mailing
- Retail/mailing → Consumption
- Consumption → Recycling
- Recycling → Energy production
- Energy production → Landfill

Value added: 993 Euro/ton of dry wood

**Wood Products Industry**
- Forestry → Sawing
- Sawing → Manufacturing of wood-based products (carpentry)
- Manufacturing of wood-based products (carpentry) → Construction & consumption
- Construction & consumption → Reuse and recycling
- Reuse and recycling → Energy production
- Energy production → Landfill

Value added: 1044 Euro/ton of dry wood

**Bioenergy**
- Forestry & Procurement of by-products → Energy production

Value added: 118 Euro/ton of dry wood
Recognizing the social value chain

**EMPLOYMENT**

Pulp and Paper Industry
- Forestry → Pulping
- Paper-making → Printing & publishing
- Retail mailing → Consumption
- Recycling

Wood Products Industry
- Forestry → Sawing
- Manufacturing of wood-based products (carpentry products) → Construction & consumption
- Reuse and recycling

Bioenergy
- Forestry & procurement of by-products
- Energy production

124 man-hours/ton of dry wood
54 man-hours/ton of dry wood

EPF

= 2 man-hours/ton of dry wood
Commissions communication on RES

- By the end of 2005 the Commission promises to come up with a coordinated biomass plan that will ensure that “the use of biomass for energy purposes does not lead to the undue distortion of competition”.

- Main actions will still be in the hands of national and local authorities.
Conclusions and recommendations

• **Avoid massive burning** of wood for purely energetic reasons

• **Respect the value chain** of wood-based products as long-lasting pools of carbon, substantially contributing to climate change mitigation

• **Do not “subsidise away”** wood as a raw material for durable applications by favouring the firing of trees, unless locally socio-economic and environmental considerations are compelling
Conclusions and recommendations (2)

- Recognise the superior **eco-efficiency** of wood-based products and their supreme properties in recycling, with minimal energy use, as compared to other materials;
- Focus future EU and member states research policies on **efficient recovery** of forest residues and development of **biomass crops** specifically grown for energy generation;
- Adapt the “163 million m³ fuelwood” to a realistic target level.
Conclusions and recommendations (3)

- Adopt sincere and visionary thinking about long-term strategies for wood resource use

- Use a realistic and balanced approach considering all three pillars of sustainable development

- And: only burn wood after it has been fully and soundly used
For more Information

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