Biotic Raw Materials and innovative value chains

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Primary Biotic Raw Materials

**Natural Rubber**
- About 1 million tons of Natural Rubber is used in the EU
- Around 12 million tons of natural rubber were produced worldwide (mainly Asia) in 2013. No production in Europe.

**Wood (hardwood + softwood)**
- About 425 million tons of wood is produced and used in the EU28 in 2014 and 161 million hectares of EU surface is covered by production forests
- Industrial Hemp (seeds, oil, fibre) Cultivation Area 2016 in the EU: 33,300 ha
- Ecosystem services
- Cork, Bark, Sap, Hemp
Annual production of roundwood, EU28

circa 650 m$^3$ below bark
Forests - a resource for human creativity

A knowledge-based society, sustained in every way by growing European forests
The wood-based value-web

Pillar I: Supply Certification FSC & PEFC

1. Timber

2. Pulp wood

3. Residues

Pillar II: Processing

Pillar VI: Markets & Applications

Closed loops

Pillar III: Closed loops
Biotic supply - forestry

• Large collection areas and fragmented ownership (dispersed operations)
• Regeneration periods measuring ca 50-100 years
• Influence of climate and biotic disturbances (storms, drought, fire, pests)
• Need to respect additional roles of forests (biodiversity, recreation, soil, hunting, foraging, water protection etc)

• Micro-climate variations (e.g. elevation)
• EU has no regulatory mandate on forests
• 3D-challenge: Operations & logistics take place with spatial restrictions
• Rural business
• Open Skies advantage
Processing: Woodworking Industries

- Cost of raw material and personnel costs are major cost items
- 365 000 Family businesses and SMEs
- Saw mills, board producers, furniture makers, building companies,
- Plywood, MDF, LDF, Veneer, Cross-Laminated Timber, solid timber, saw-dust...
Processing: Pulp & Paper

- Energy-intensive industry
- Similarities to mining
- Economy by scale
- Capital costs key, so running production 24/7 is crucial
Closed Loops
Markets & Applications

- Paper-based electronics
- Nanocellulose
- Carbon fibres, Graphene, nano-foams, composites

Textiles from European Forests
- Thermal regulating
- Odor proof
- Wrinkle resistant
- Covered waistband
- Wrapped and seamless
- Static free
- No ride up
- Form fitting
- Elastic threading

Indoor wood products

Advanced wood construction

- Packaging
- Paper
- Hygiene products
  - Energy, Fuel, Freight
FTP Vision Target #2

• “.... Bearing in mind the full range of demand and production constraints*, harvesting possibilities in Europe have increased by 30% (by 2030), enabling forest owners to manage their forests more efficiently and sustainably. “

* In many regions specific forest growth is increasing and management is optimised for additional harvesting possibilities. In other regions, especially in the Mediterranean area, where the impact of climate change is predicted to be severe, creating resilient, stress-tolerant forest is particularly important. In some landscapes the main aim is nature conservation and providing ecosystem services.
Benefits for society?

+120 Million m³ timber harvested each year
+ 5 bn Euro value for forest owners*

Or alternatively*:
+ 24 Mtoe = 20 days of EU:s total petroleum products consumption
+ ca 20 bn Euro value

But if the timber is utilised by the forest-based industries*:
+75 bn Euro in value

* These figures are calculated using theoretical values and trade statistics. Precision is not guaranteed