



Biotic Raw Materials and innovative value chains

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Primary Biotic Raw Materials

Natural Rubber

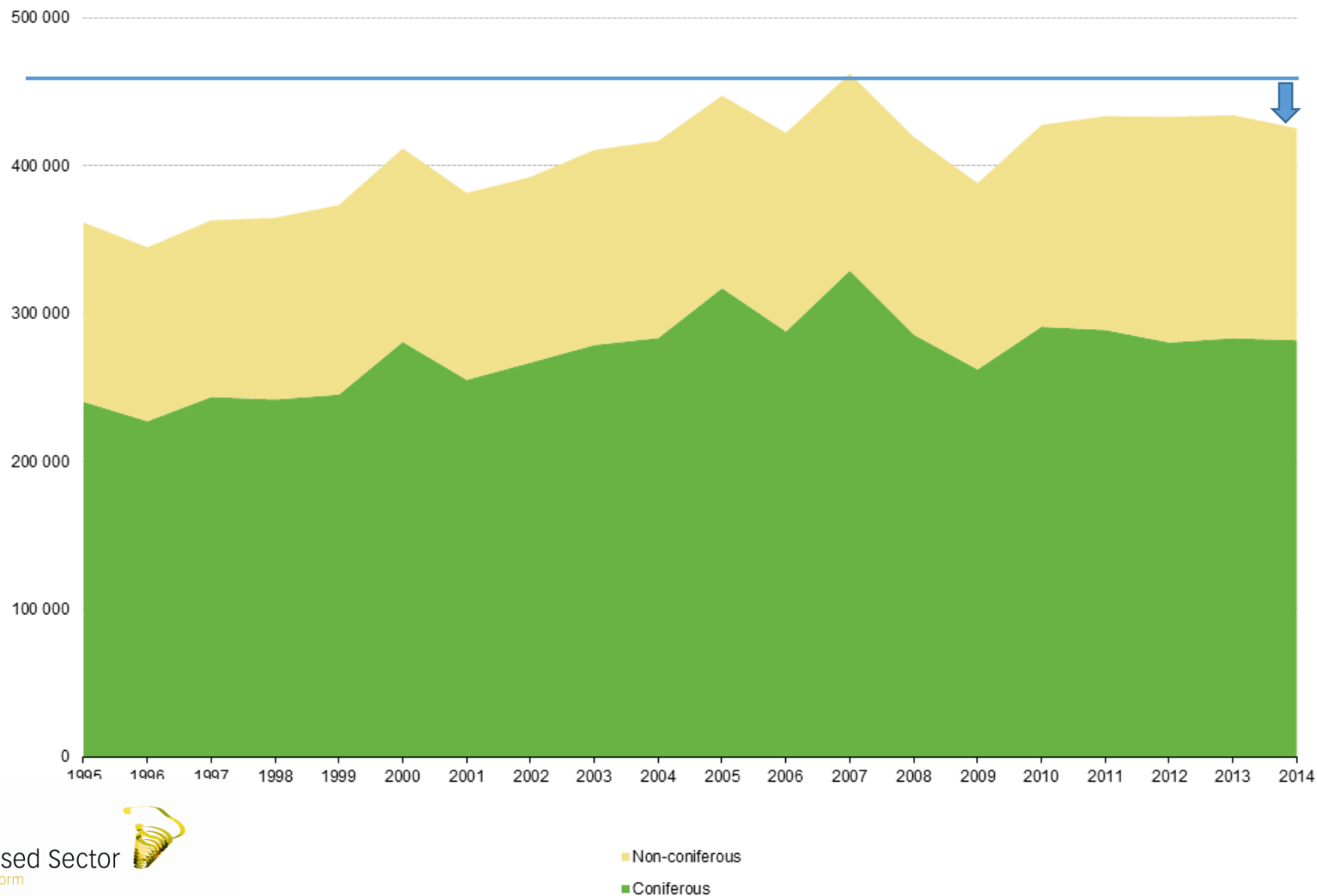
- About 1 million tons of Natural Rubber is used in the EU
- Around 12 million tons of natural rubber were produced worldwide (mainly Asia) in 2013. No production in Europe.

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

circa 650 m³ below bark

Annual production of roundwood, EU28



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

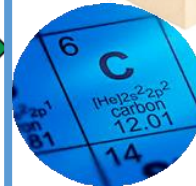
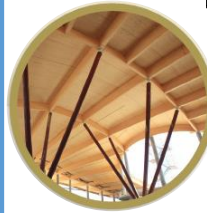
3. Residues



Pillar II: Processing

Pillar VI:

Markets & Applications



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 personell 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



- Similarities to mining
- Economy by scale
- Capital costs key, so running production 24/7 is crucial

- Energy-intensive industry

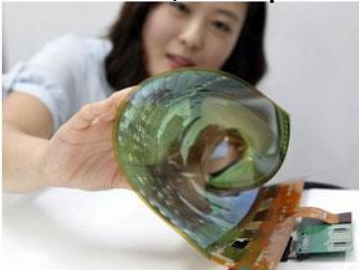


Closed Loops



Markets & Applications

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



- Packaging
- Paper
- Hygiene products
 - Energy, Fuel, Freight



Textiles from European Forests



Indoor wood products



Advanced wood construction





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



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