Aalto University
School of Business

Circular bio-economy in manufacturing industries- similarities and differences in three sectors

Armi Temmes 16.9.2016
Recibi-Workshop, Syke

Comparison of Recibi cases

Case	Process/ Product	Customers	End uses
Wood-based textiles	• Chemical • Design • Fibres • Garments	• Garment and textile producers • Retailers	• Consumers • Use time short or medium
Use of wood in construction	• Mechanical • Wood products • Buildings	• Builders, planners	• Building owners/ managers • Use time long
Biorefineries	• Chemical • Fibres • Energy • Numerous other products	• Industry • Fuel producers and retailers	• Industry intermediates -> multitude of end uses • Fuels • Use time very short

Potential to enhance bioeconomy and/ or circular economy

Case	Bioeconomy	Circular econom
Wood-based textiles	Replacement of synthetic fibres.	• Reuse • Extended life time • Recycling for new fibres • Collection systems
Use of wood in construction	Replacement of steel, concrete etc.	• Maintenance • Modifications • Demolishing and materials reuse
Biorefineries	Replacement of oil-based chemicals or fossil fuels Increase of value added from wood.	• Process-internal recycling • Numerous recycling systems based on end product

Most of these do not happen automatically

Potential for circular bioeconomy

Case	Strengths	Challenges
Wood-based textiles	R&D for new products and processes also for recovered raw materials. Piloting for collection systems.	Commercialization not yet there. New networks needed for recycling. Spinning and weaving have disappeared.
Use of wood in construction	Large number of pilot high-rise buildings. Know-how from small buildings.	Advantages of wood for users not clear. Path dependence due to existing capabilities.
Biorefineries	Technology development in e.g. lignin use and base chemicals production.	Strong emphasis on low value products such as fuels.

Are Finland and Sweden different?

- **Not much**
- **Textiles**
  - Both have technology development in novel wood-based and/or recovered fibres (Ioncell-F & RENEWCell)
  - In Sweden more concrete plans on large scale textile sorting
- **Construction**
  - Both have piloting on wood construction for high-rise buildings
- **Biorefineries**
  - Both have various approaches for biorefineries both for fuels and cellulose fibre by-products, but no break-throughs on value-added products