

**Forest Academy for EU Decision Makers,  
Finland 20 September 2023**

## **Visions on the future use of wood**

**Aspects on Forest Based Product  
Innovation and Their Impact**

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VTT



**We live in the fastest turn  
around in forest industry in  
hundred years**

## Three different aspects

- Recycle or reuse
- Added value products
- Green house gas capturing

## Basic statements

- Material consumption and growth are still linked
- Limited raw-material base leads to competition
- Material field and lifetime can be increased by energy

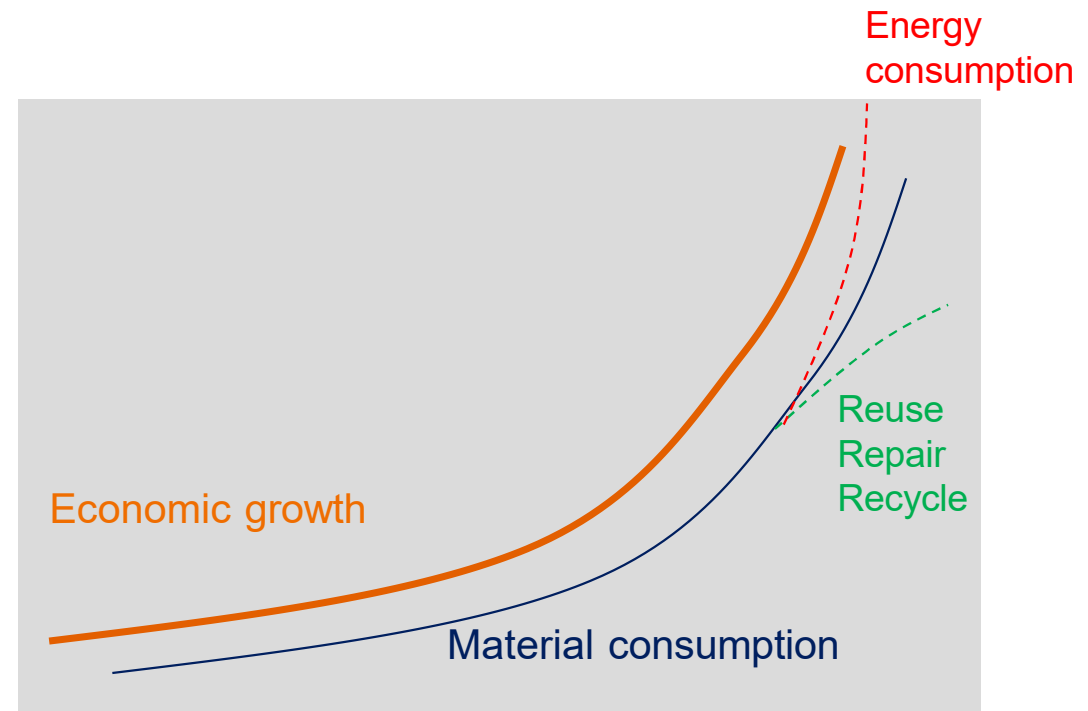


VTT – beyond the obvious

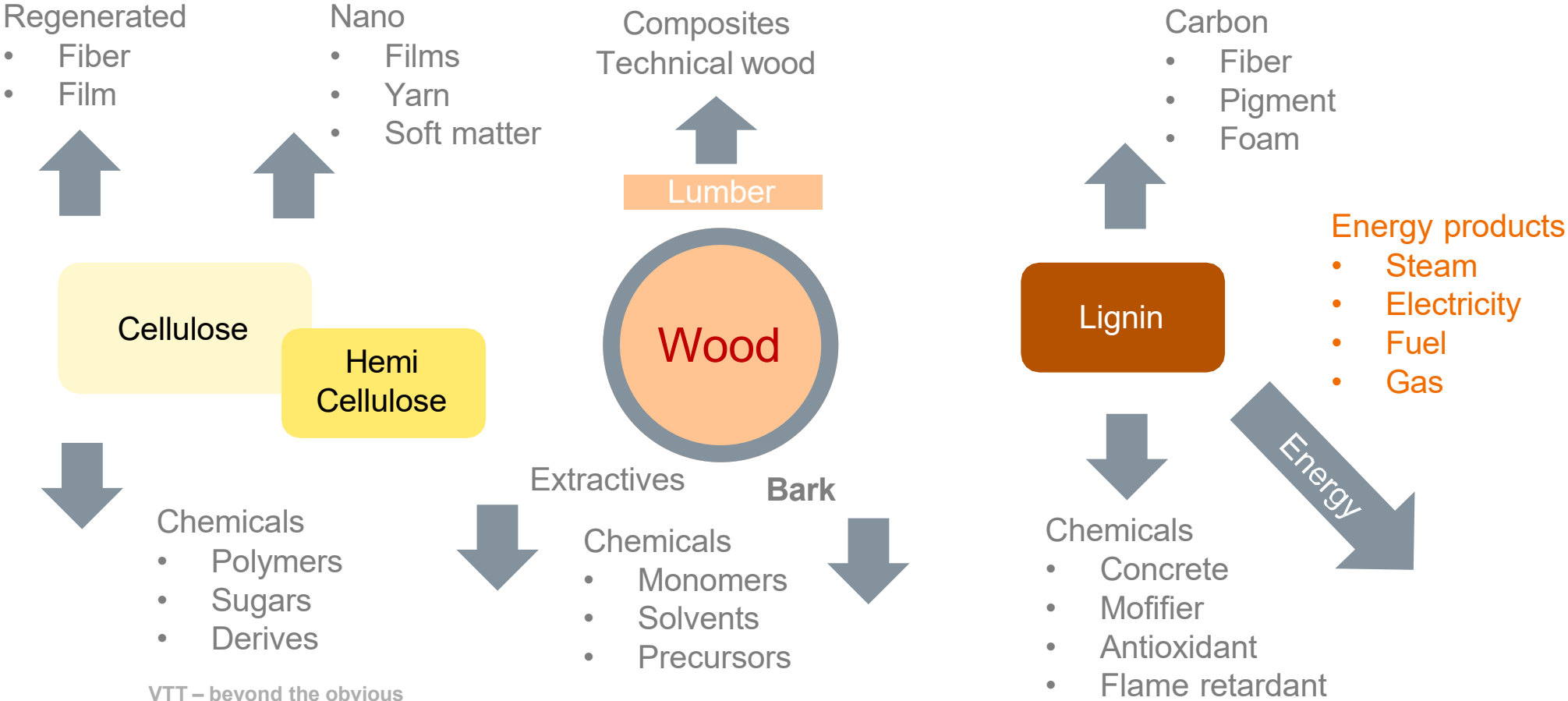


# Material consumption vs. growth

- Because of linear consumption models material consumption will increase accordingly
- Disconnecting the development is needed repairing, reusing and recycling
- This leads to more energy consumption



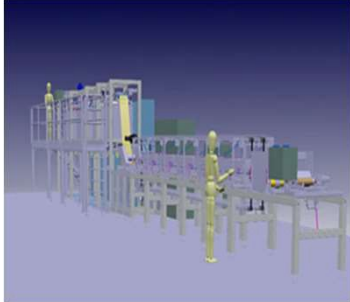
# Product platforms





# Flex pack: Clear films, wraps

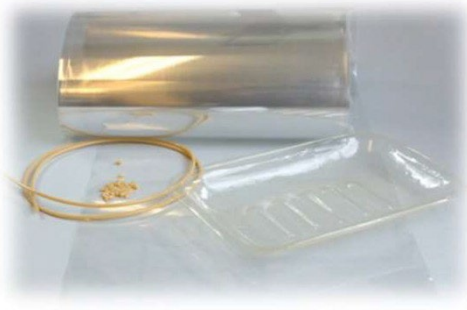
- Fastest growing plastic application: single packed foods/goods
- Challenge for recycling: light weight, multi layers
- Packaging papers?



Nanocellulose



Regenerated



PGA, PEF



# Rigid pack: Moulded web, modified atmosphere

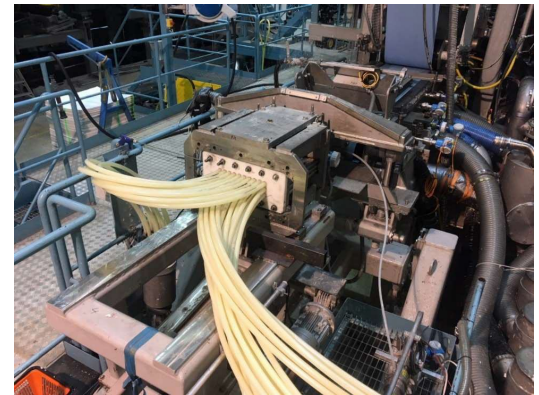


- E.g. trays
  - PES vs.
    - Moldable web
    - Fiber cast
  - Films
    - Barrier layers: alternative polymers, thin layers
    - Alternative films (cellulose, bioplastic)



## Secondary packaging, composites...

- Use of secondary packaging increases
  - Fluted
  - Folded board
  - Replacement of EPS (fiber cushioning)
- Classic: Reusable / paper bags vs. plastic bags



VTT – beyond the obvious



# Economic model for textiles in Finland

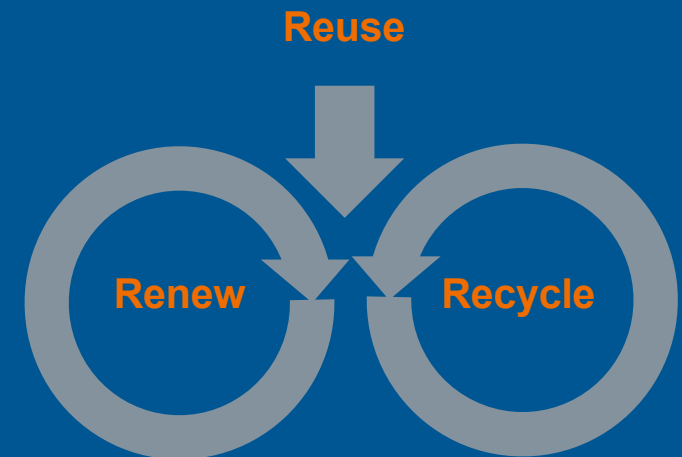


**Finland as a forerunner in sustainable and knowledge-based textile industry**

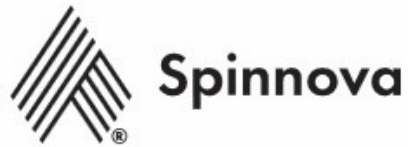
Investments worth of billion euro and almost 17 000 new jobs by 2035

# Combining renewing and recycling

- Main fiber materials are polyester and cotton
  - Reuse
  - Mechanical recycling
- Cellulose is one major solution:
  - Renewable without extra fields occupied
  - Recyclable via regeneration
  - Biodegradable solving microplastics
- Polyester
  - Dominant due properties
  - Polymeric alternatives available
  - Chemical recycling option



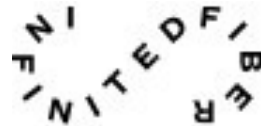
# Novel cellulose-based textile fibres are emerging and going towards industrial scale



Spinnova and Suzano to open commercial scale factory in 2022



Paimio recycle HUB, Rester and LSJH



We have created a miracle: a technology that allows textile waste to be used again and again, preserving 100% quality.

Free for publication 27.1.2022

The Finnish startup - Nordic Bioproducts Group - has successfully spun a new plant-based textile fibre.

Metsä Group and Itochu establish a joint venture that builds an industrial demo plant to produce wood-based textile fibres

**Kuura**

Metsäliitto Cooperative | Press Release | 1.10.2018 10:15 EEST



## loncell® in a nutshell

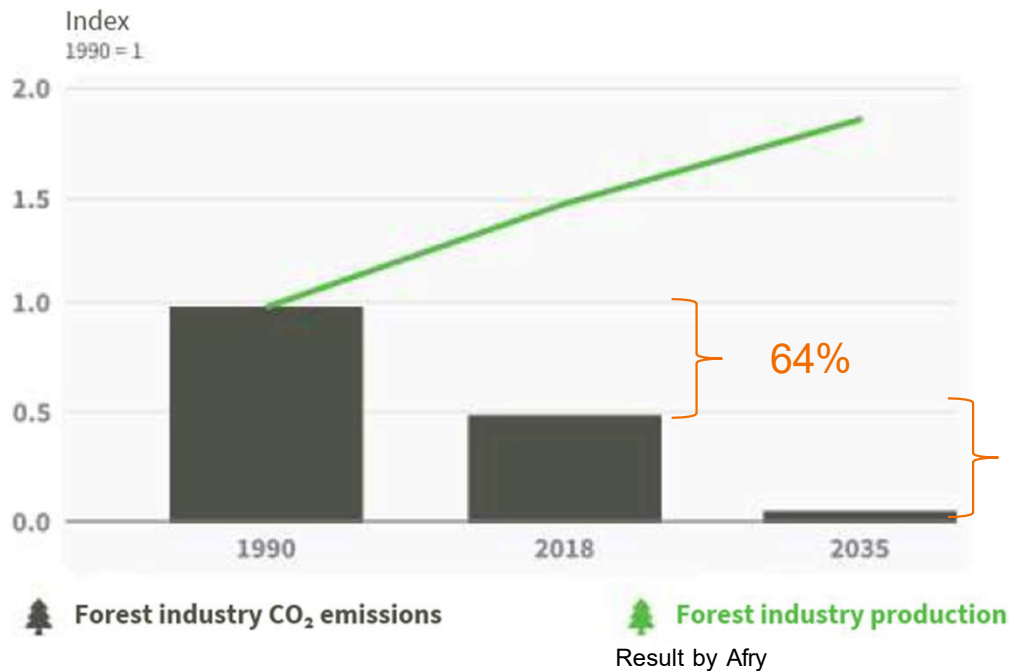
- The loncell® process uses a novel solvent called ionic liquid. It's an environmentally friendly solvent that can be recycled and isn't flammable like many others.





# Decoupling CO<sub>2</sub> emission from production

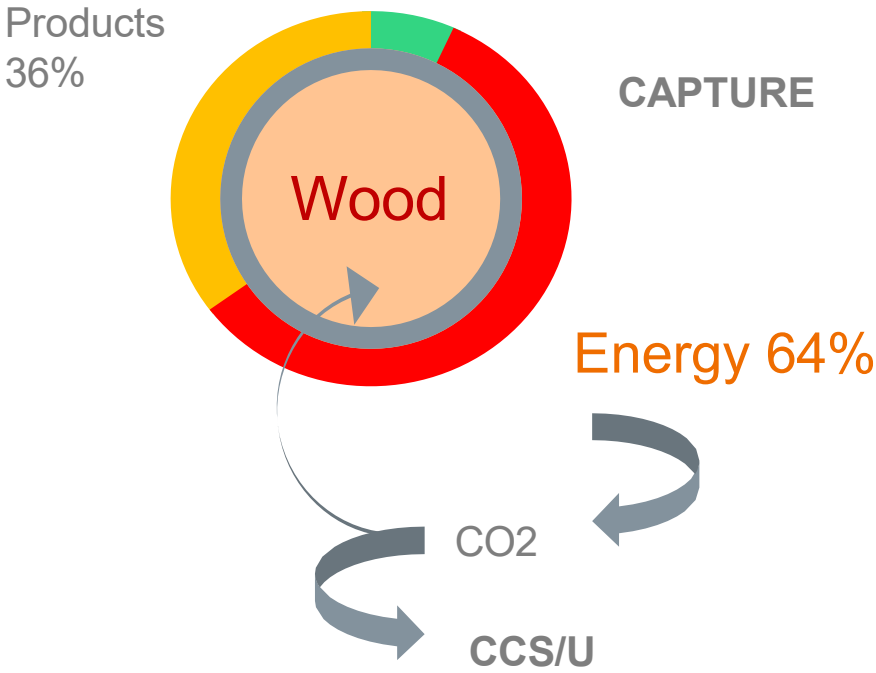
Continued decoupling of forest industry production and CO<sub>2</sub> emissions – production increases, emissions decrease



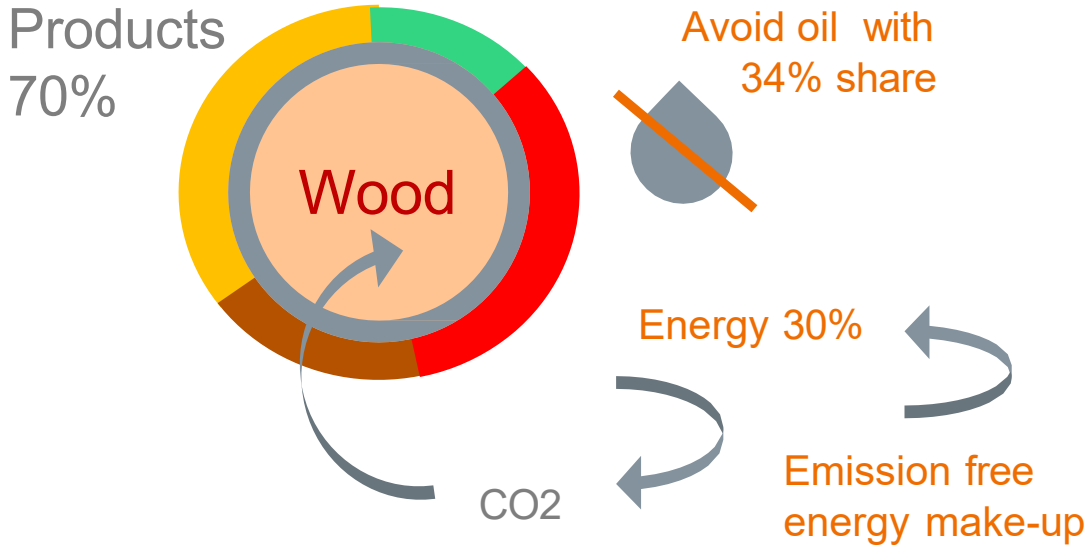
CO<sub>2</sub> decoupling is existing fact!

Trend continues

# Paradigm change



OR APPLY



## Development items

- Novel service packaging concepts
- Next generation of fiber refining
- Recovery side streams utilization
- Synthetic polymer replacements
- Towards synergistic material concepts
- Robust recycle, forming and converting

Material service for society 2030:  
over-all sustainable, efficient and affordable



# bey<sup>0</sup>nd

## the obvious

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