

**Policy event: Forest bioeconomy and the alignment of multiple policy objectives**

5<sup>th</sup> May 2026, Brussels

# Resilience through bio-based advanced materials

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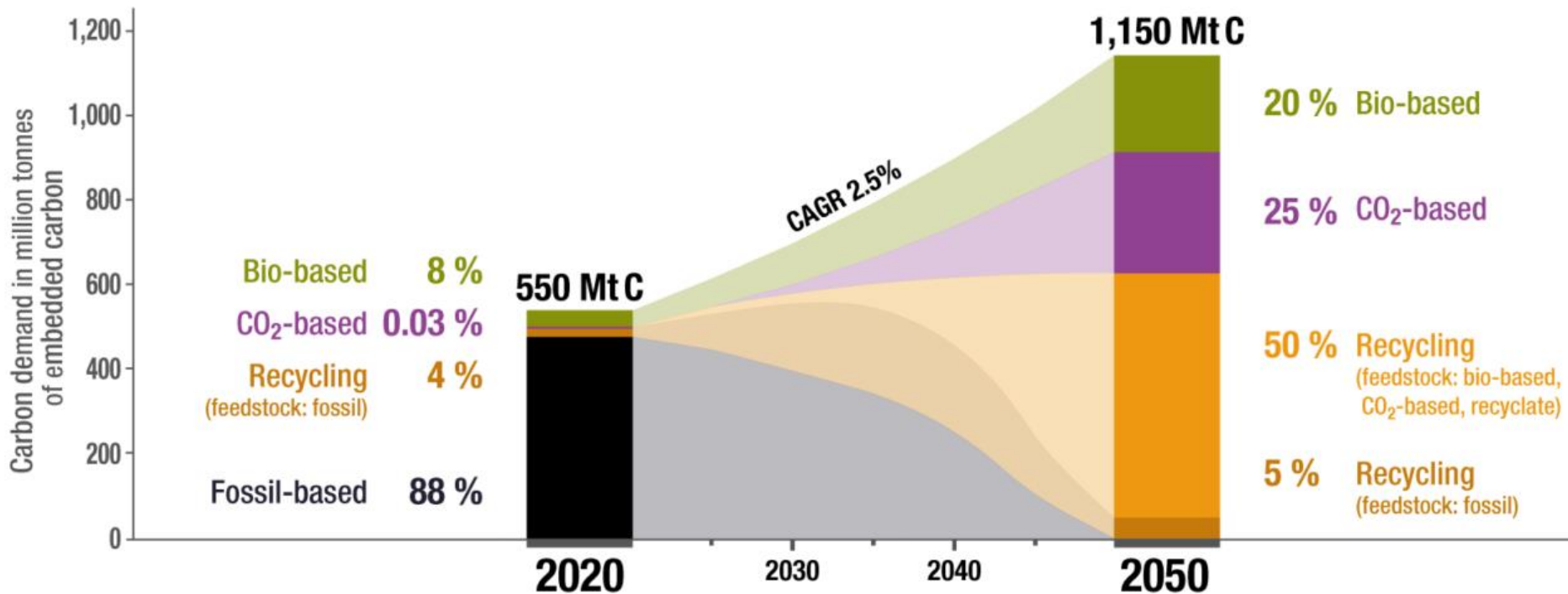
Aalto University



# We need materials now and in the future

## Carbon Embedded in Chemicals and Derived Materials

Scenario for a global net-zero chemical industry in 2050



An aerial, high-angle photograph of a large shipping port at night. The scene is filled with hundreds of colorful shipping containers stacked in neat rows across a vast paved area. Several large gantry cranes are visible, some with their booms extended over the container stacks. In the background, the dark silhouettes of ships are docked at the pier. The lighting is a mix of the cool blues and purples of twilight and the warm, yellowish glow of the port's artificial lights. The overall atmosphere is one of intense industrial activity.

# Strategic autonomy



# Pulp mills are major energy producers

**56%**

of the EU's renewable energy comes from bioenergy - about two-thirds of that is wood-based.

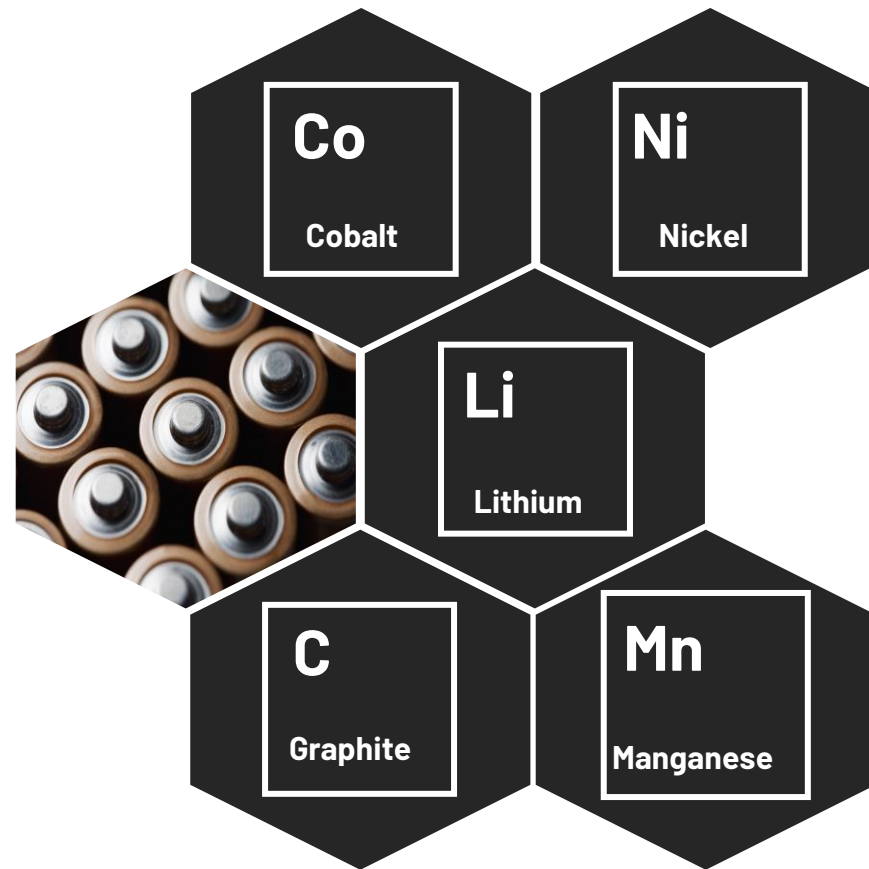
**250%**

electricity self-sufficiency at Metsä Fibre's Kemi bioproduct mill.

**~40%**

of Finland's energy in winter 2026 was wood-based, produced by pulp mills and district heating plants.

# Critical raw materials in energy storage



Harnessing the inherent  
properties of lignocellulose  
to create **new**  
**sustainable materials**

# What is a **sustainable material**?

**Bio-based**

**Locally-sourced**

**Carbon-neutral**

**Energy-efficient**

**Cost-effective**

**High-performing**

**Long-lasting**

**Biodegradable**

**Recyclable**

**The complexity of the question makes it challenging but interesting**

# Pioneering circular economy



**75%** of **paper and board** is recycled in Europe.

**9%** of **plastic packaging** is recycled globally  
– in EU, **42%**.

**~1%** of material in **clothing** is recycled into new clothing.





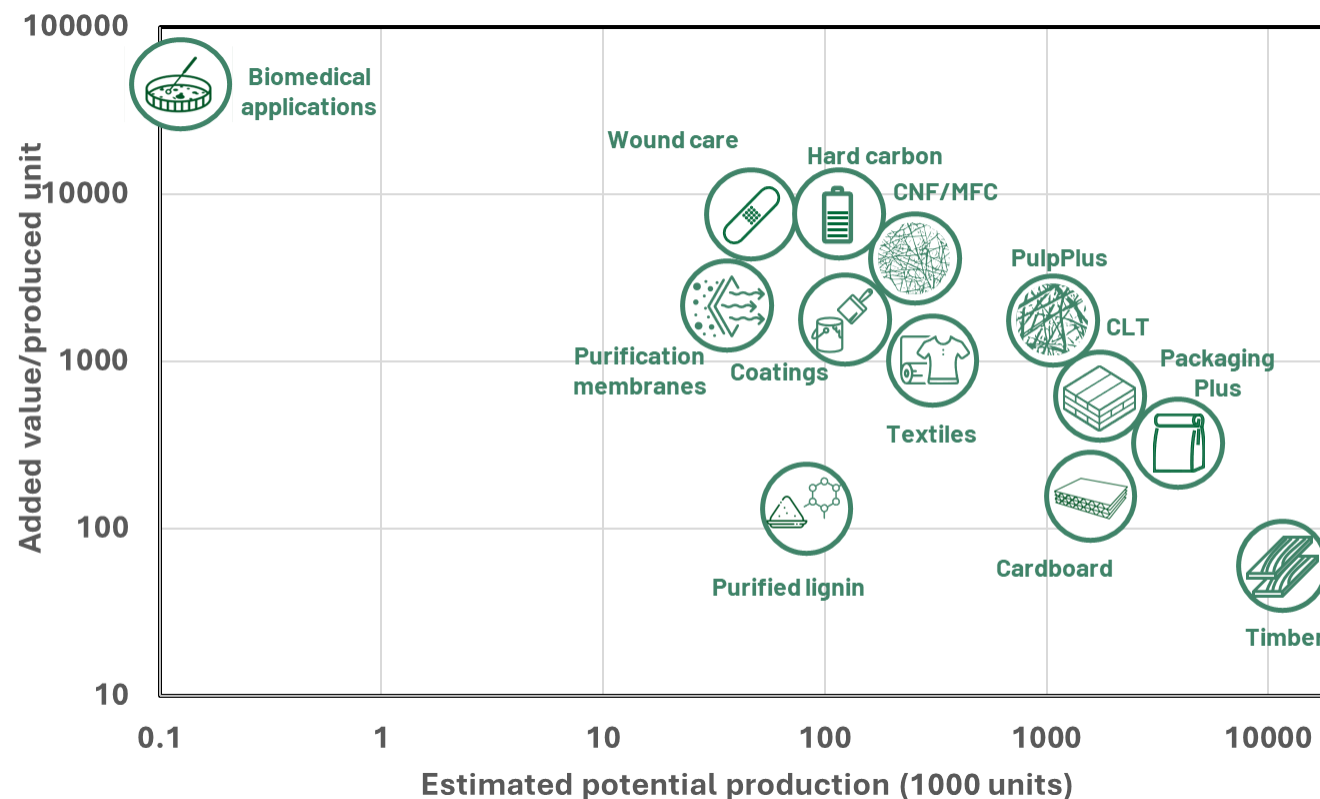
REPORT OF THE FINNISH FOREST BIOECONOMY SCIENCE PANEL 1/2024

# From timber to medicine

Value added for the forest sector through broadening the product portfolio

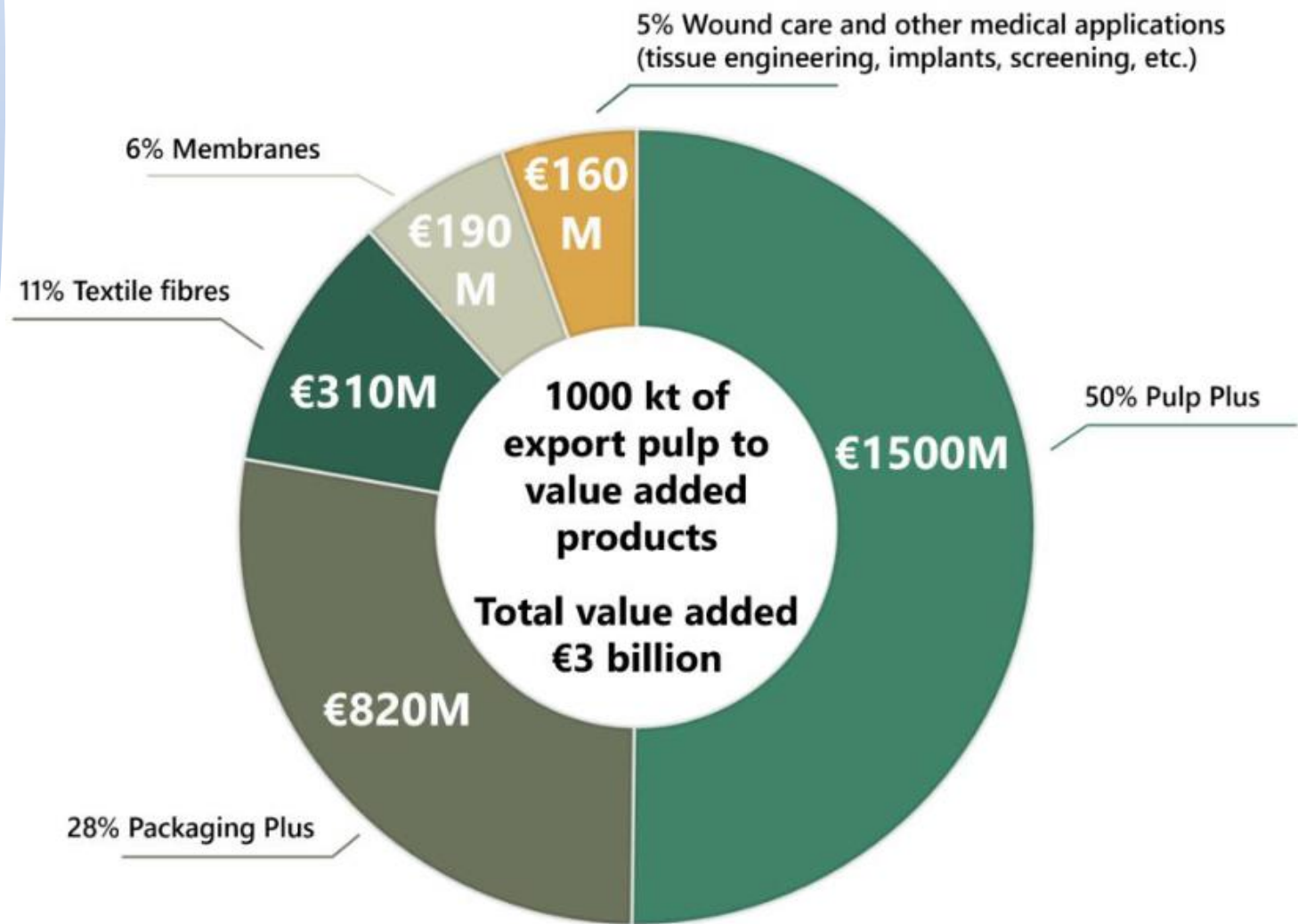
Monika Österberg, Markku Karjalainen, Jussi Lintunen, Tekla Tammelin, Antti Asikainen, Esa Vakkilainen, Ritva Toivonen, Pasi Virta, Alexander Henn, Emmi-Maria Nuutinen, Johanna Kohl, Jukka Hassinen

# Sustainable economic growth and competitiveness for forest sector



Example product scenarios to reach value-add targets in Finland by 2035

<https://urn.fi/URN:ISBN:978-952-65456-3-9>





40% of Finnish lignin  
(1 600 kt)  
to products  
could equal  
**€1.5 billion in  
added value**



# Transparent lignin

for photonics and anti-fogging coatings

# Advanced materials

Definition: Materials rationally designed with new or enhanced properties or targeted structural features to achieve specific performance.

Not just **replacing fossils** with renewables but creating new **superior materials**



# Elements of success



**Industrial and R&D policies** that support the goal of moving from research to industrial production **with accelerated speed**



Regulatory landscape that **promotes rather than inhibits** taking investment risks



**Sufficient funding** for the whole innovation chain **from R&D to investments**



**Market driven demand** for more sustainable and bio-based products


**Prosperity and protection  
aren't a trade-off  
- only a test of will**



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