FinnCERES
Materials Cluster

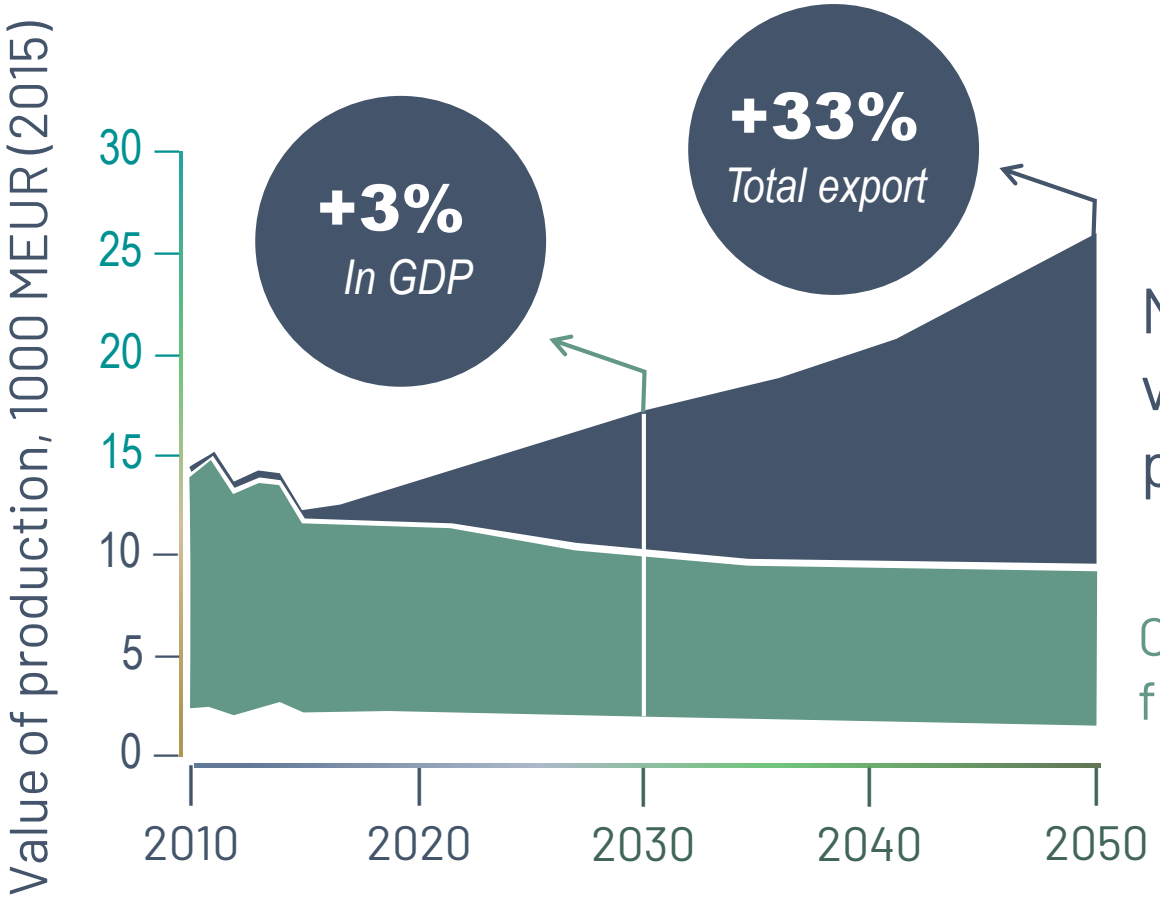
Redefining **Bioeconomy**

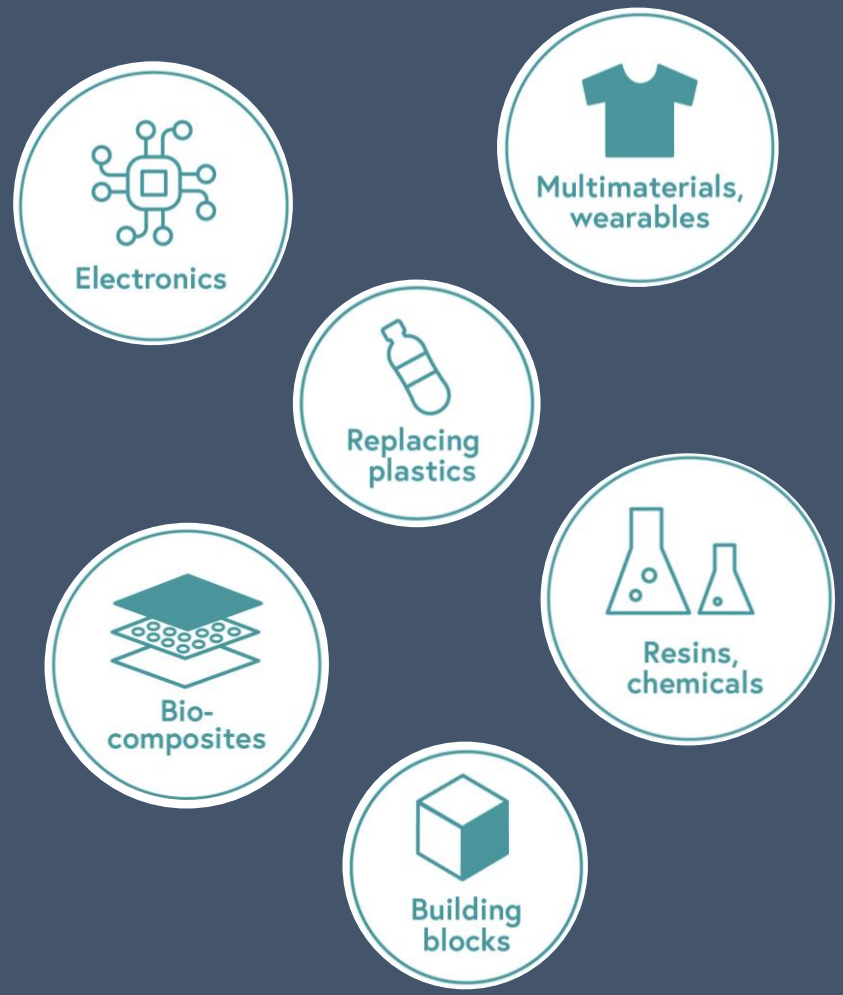
With advanced bio-based materials

Alina Ruonala-Lindgren, VTT
Co-creation Manager

Metsäneuvoston Tutkimus, uudet tuotteet ja liiketoimintamahdollisuudet –seminaari 8.2.2021

Value of Finnish forest sector could double by the 2050s





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Source: Arasto, Antti; Koljonen, Tiina; Similä Lassi (eds.). 2018. Wealth from bioeconomy - Integrated bioeconomy and low carbon economy futures for Finland, VTT Technical Research Centre of Finland Ltd. Comparisons are made to year 2016. *Disclaimer*: Other versions of this graph are incorrect.

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

Cellulose as **FUTURE PLASTIC**

Ligno-cellulose - based **ELEC-TRONICS**

Wood-derived **WATER & AIR** purifi-cation systems

Solid foundation for **FUTURE BIORE-FINERIES**

Fundamental Scientific Discoveries

- A flexible scientific competence center for the materials bioeconomy run by VTT and Aalto university
- World-class biomaterials research, highly skilled professionals and cooperation with industry leaders - research infrastructure from laboratories to large-scale pilot projects
- FinnCERES Flagship total budget 24 M€ for eight years, started 2018

Replacing polyester?

Aim: Substitute polyester and decrease the environmental impact of textile dying.

The imminent decline of cotton production and the rapid increase in textile demand puts high pressure to improve the properties of alternative textile fibres. Currently, fossil-based polyester is the fastest growing substitute for cotton. The need to create bio-based alternatives to polyester is vital. By modifying the cellulose fibre with reactive chemical groups, water resistance typical to polyester can be achieved.

The same chemistries can also be used to improve dying the textile fibre. This offers an environmentally friendly way to reduce the use of textile dyes.

The research group has successfully adapted commercially available methods for enzyme treated BIOCELSOL fibres and created new functionalities to the final cloth.

Marjo Määttänen, VTT
Harri Setälä, VTT
Marja Rissanen, Aalto

Aim: **Easy to use, cheap, sustainable materials to remove microplastics from water.**

Capturing microplastics with nanocellulose

Nanocellulose materials can capture harmful nano- and microplastics in the environment.

This research is highly relevant for the water purification, waste stream purification and microplastics (polymer) producing industries, filter technology companies, and makers of household products (laundry, dishwashers etc.).

Benjamin Wilson, Aalto
Suvi Arola, VTT

Aim: Create **biodegradable** components in **electronics**

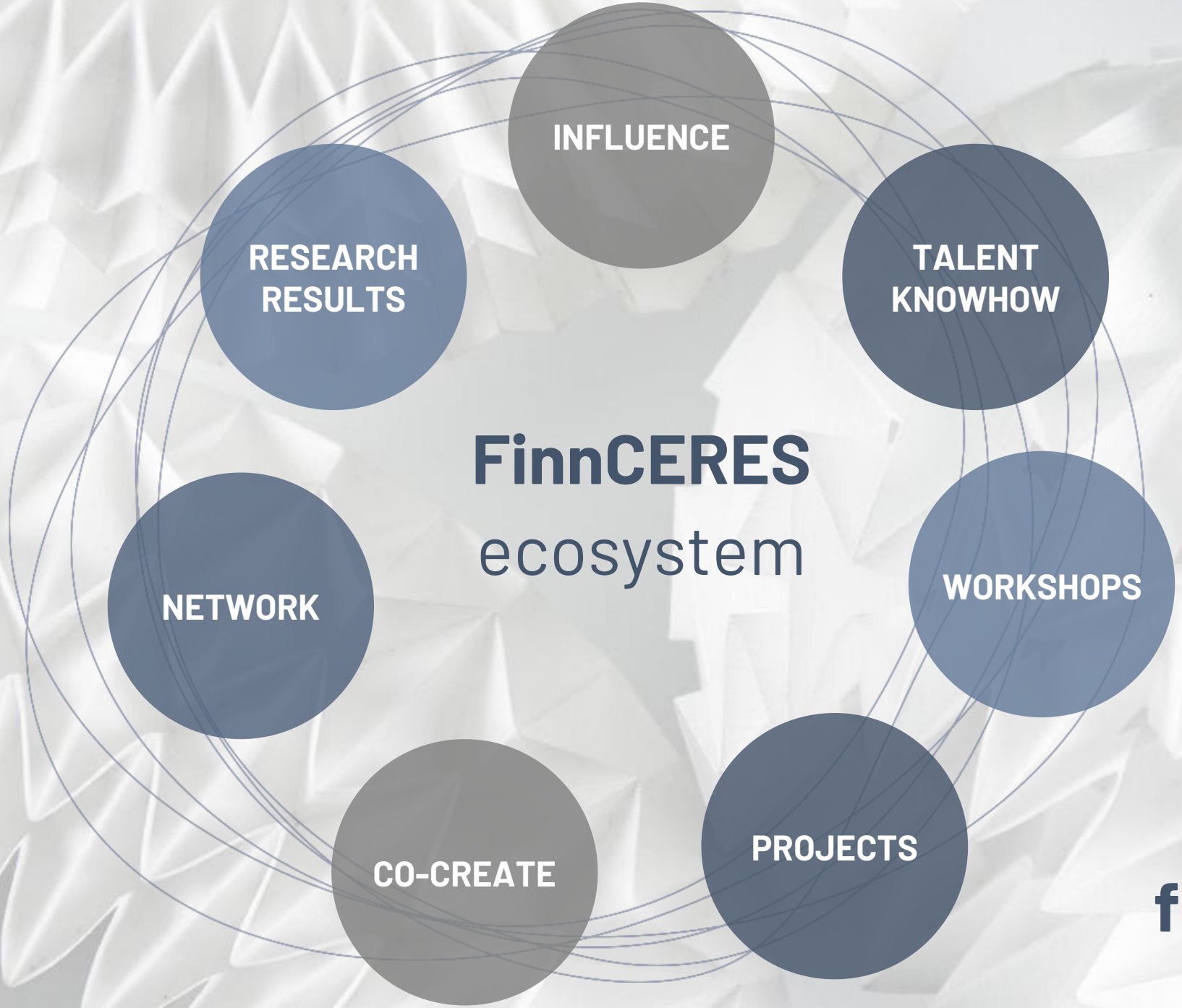
Wood-based **optical fibre**

In this groundbreaking research, light is successfully transmitted through a **wood-based** fibre.

Cellulose-based fibre offer new opportunities for sensor applications. The material used in cellulose fibres can with the substances being measured and absorb them, which is difficult for glass or plastic fibres.

Ari Hokkanen, VTT, Hannes Orelma, VTT

ECOSYSTEM



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