

Perspectives of the Materials Bioeconomy



Orlando Rojas

- **Key Enabling Technologies**
- **FinnCERES positioning**
- **Our collaborators**
- **KPIs**



FinnCERES
Materials Cluster



[#FinnCERES](https://twitter.com/FinnCERES)

www.finnceres.fi

EU Key Enabling Technologies for the future Bioeconomy



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Advanced Manufacturing Technologies

Advanced Materials and
Nanotechnology

Life Sciences Technologies

Micro-, Nano-electronics and
Photonics

Artificial Intelligence

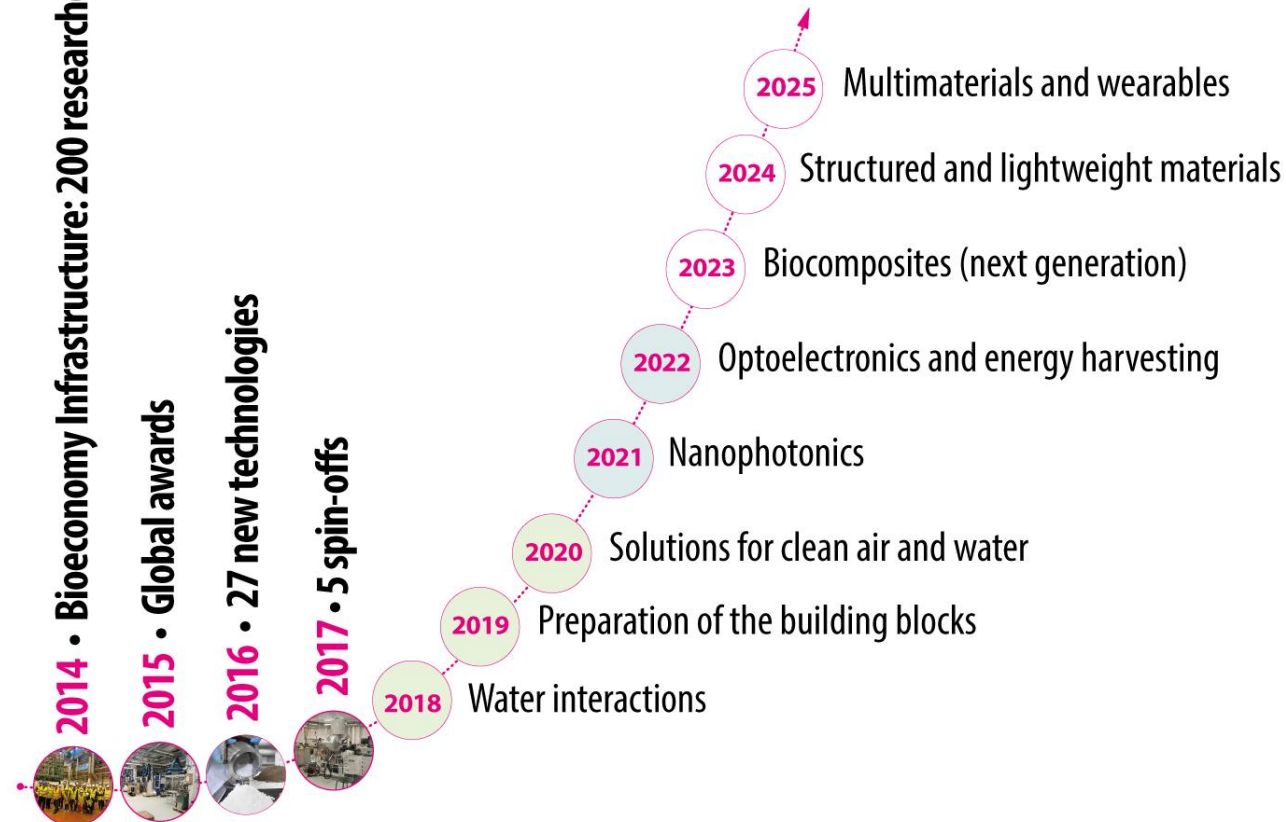
Digital Security and Connectivity

2014 • Bioeconomy Infrastructure: 200 researchers, 3 COE's

2015 • Global awards

2016 • 27 new technologies

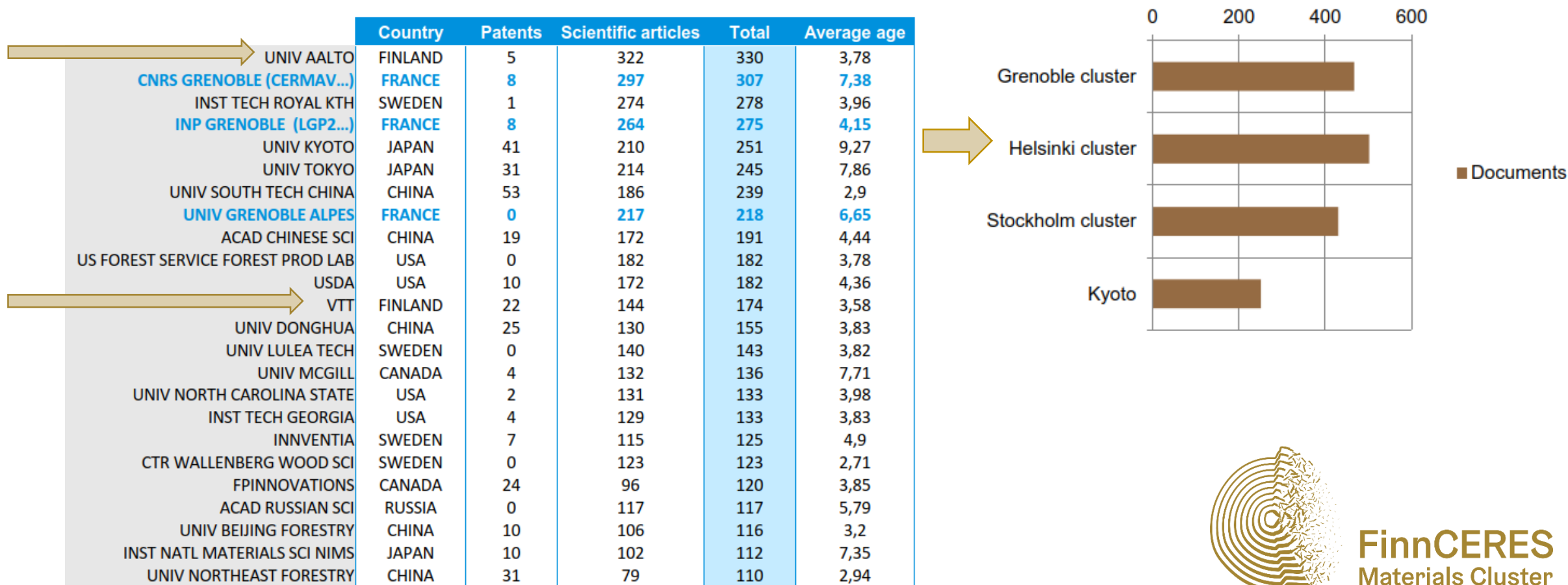
2017 • 5 spin-offs



FinnCERES: presence in the world



Worldwide cartography on
nanocellulose



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Global Challenges

- *Climate change*
- *Resource sufficiency*
- *Quality of life*

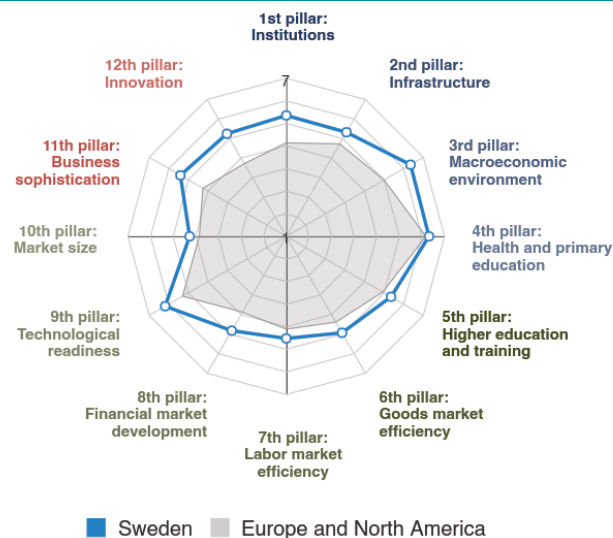
**Urgent need
to transform
the existing materials
paradigm**





TREESEARCH
www.treesearch.se

TreeSearch is Sweden's so far largest investment in creating collaboration on research in the area



5th pillar: Higher education and training	18
6th pillar: Goods market efficiency	14
7th pillar: Labor market efficiency	20
8th pillar: Financial market development	10
9th pillar: Technological readiness	5
10th pillar: Market size	40
Subindex C: Innovation and sophistication factors	5
11th pillar: Business sophistication	6
12th pillar: Innovation	7



CHALMERS

li.u LINKÖPING UNIVERSITY



Mittuniversitetet
MID SWEDEN UNIVERSITY

AHLSTRÖM
MUNKSJÖ

BILLERUDKORSNÄS

HOLMEN

NESTE

SCA



SÖDRA

Tetra Pak®

RI
SE
Research Institutes
of Sweden

VINNOVA
Swedish Innovation Agency

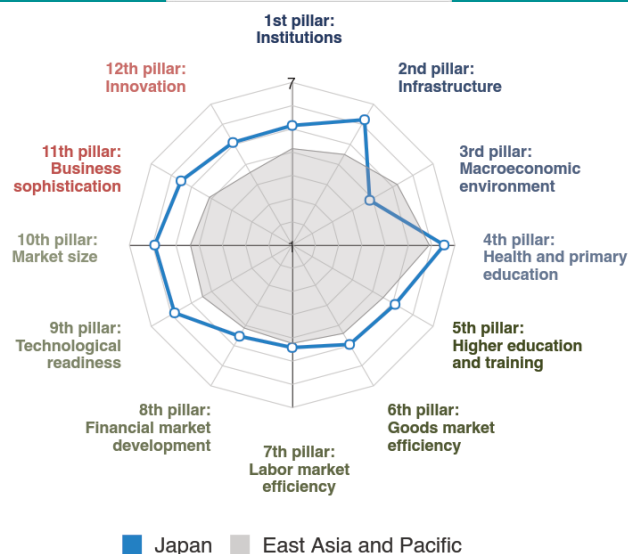


Fond of Åke
Wallenberg
Stiftelse

**Associated researcher open to:
Researcher in the academy
PhD student or postdoctor
Researcher in industry or at institute
(TreeSearch partners only)**

- **Regularly participate** in activities organized by TreeSearch (such as conferences and workshops).
- **Present research and research results** in conferences, workshops, etc.
- **Acknowledgments in publications:** *Associated projects* are encouraged to have the following wording in acknowledgment: "This research has been supported by TreeSearch.se". Publications where *TreeSearch has contributed with support for use of research infrastructure* should have the following wording in acknowledgment: "This research has been supported by TreeSearch.se".
- **TreeSearch PhD students** are encouraged to participate in courses provided within the framework of TreeSearch. The courses will both provide relevant, updated knowledge and give a network for the future.
- **Inform TreeSearch** about activities carried out in projects where other researchers in TreeSearch can be invited and participate. Dissertations will be advertised on the TreeSearch website.

Sweden is well positioned to contribute to and benefit from technological advances, with top ranks for technological readiness, business sophistication and innovation.

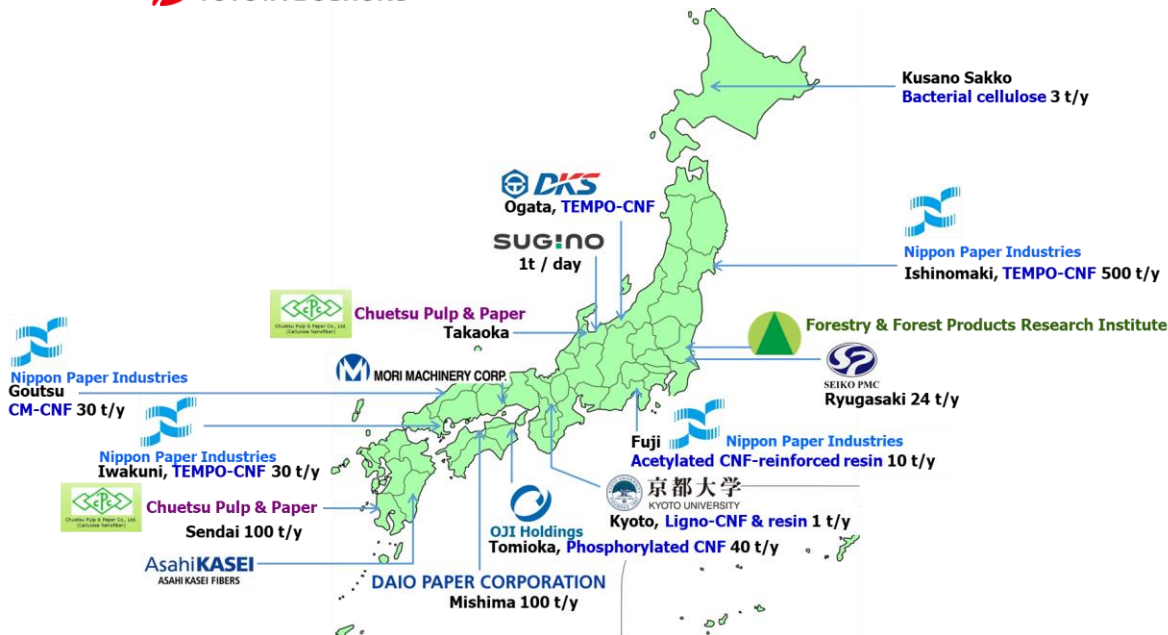


5th pillar: Higher education and training	23
6th pillar: Goods market efficiency	13
7th pillar: Labor market efficiency	22
8th pillar: Financial market development	20
9th pillar: Technological readiness	15
10th pillar: Market size	4
Subindex C: Innovation and sophistication factors	
11th pillar: Business sophistication	3
12th pillar: Innovation	8

Japan performance is largely driven by high-quality physical and digital infrastructure (4th), a healthy and educated workforce



Public/private partnership with over 280 members (176 corporate) to accelerate the research, development, commercialization and standardization of nanocellulose

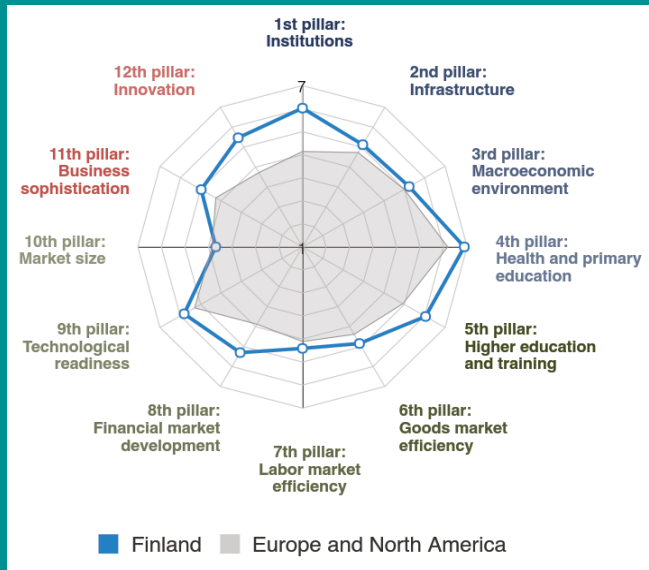


Canada ranks 7th in labor market efficiency, driven mainly by the efficient use of talent (3rd)



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Focuses on future solutions of the bioeconomy and on materials research. Will develop novel lignocellulose-based materials

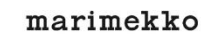


5th pillar: Higher education and training	2
6th pillar: Goods market efficiency	17
7th pillar: Labor market efficiency	23
8th pillar: Financial market development	4
9th pillar: Technological readiness	16
10th pillar: Market size	60
Subindex C: Innovation and sophistication factors	8
11th pillar: Business sophistication	14
12th pillar: Innovation	4

Top rank in education. Prepares the younger generation for the 4th Industrial Revolution. High levels of investment in human capital and innovation (ranked 4th globally).



KEMIANTEOLLISUUS



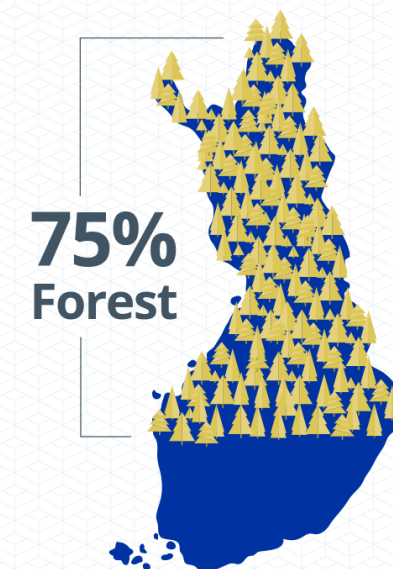
Finland

Unique IP focus: Paper, paperboard, cellulosic pulp and fibers

Why: Forests cover **75 percent** of Finland's land area and the forest industry accounts for **over 20%** of export revenue.



Paper,
paperboard,
cellulosic pulp
and fiber



Source: Finnish Forest Association (2016). Finnish forest resources.

FinnCERES Scientific Advisory Board



Professor **Lars A Berglund**

The Royal Institute of Technology (KTH), Sweden

Expertise:

- New materials from trees
- Nanostructural aspects of biocomposites
- Nanocellulose, nanopapers, aerogels and foams



Professor **You-Lo Hsieh**

University of California, USA

Expertise:

- Textiles and clothing
- Polymer chemistry & fiber engineering
- Functional nanomaterials



Professor **Harry Brumer**

The University of British Columbia, Canada

Expertise:

- Molecular details of polysaccharide synthesis
- Biogenesis & Deconstruction of plant cells
- Recycling of biomass - global carbon cycle







Professor **Akira Isogai**

The University of Tokyo, Japan

Expertise:

- Cellulose, chitin and other polysaccharides
- Novel cellulose-based nanomaterials
- New nanocellulose-based devices

Relative ranking in Global Competitiveness Index 2017-2018

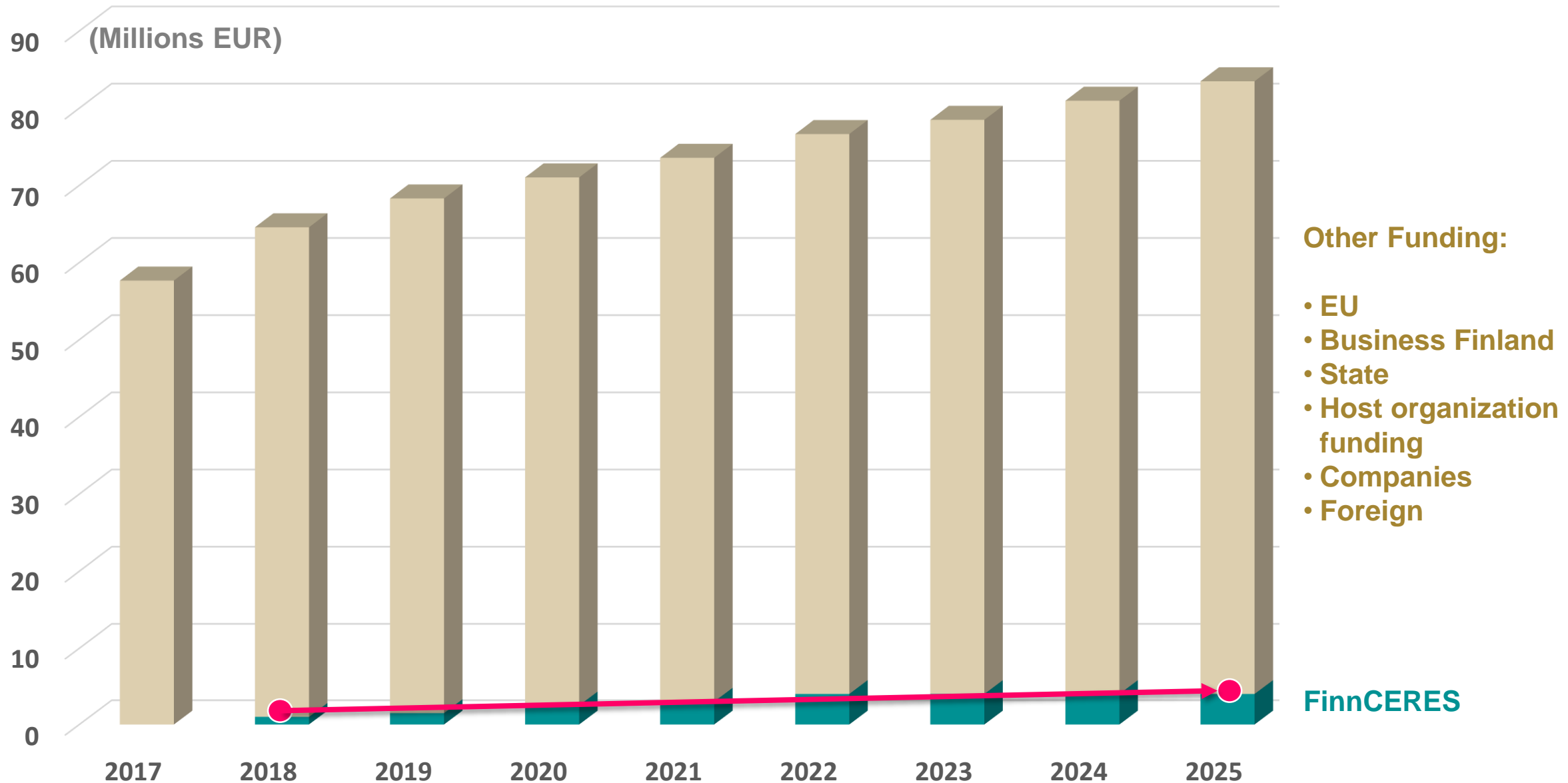
				
Higher education and Training				✓
Financial market development				✓
Technological readiness	✓			
Market size		✓		
Labor market efficiency			✓	
Innovation				✓



...but there is something that Sweden has that Finland does not:



Future Finnish bioeconomy and FinnCERES



Let's realize **TOGETHER** the renaissance of the **Finnish Forest Bioeconomy**

4 new research areas

~25
new technologies

~300
invention disclosures



8 Start-ups

80 new products
and services

80 new company
collaborations



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