

New markets for biomaterials and bio-based chemicals



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 Made from
a tree

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**Everything
that's made
from fossil-based
materials today
can be made from
a tree tomorrow.**



The new divisional structure strengthens our strategy execution



Growth



Packaging Materials
Consumer board and containerboard business



Packaging Solutions
Corrugated packaging together with recently created formed fiber unit



Biomaterials
No changes



Wood Products
No changes



Forest
Nordic forest assets and wood supply operations in Nordics, Russia, and Baltics

Cash

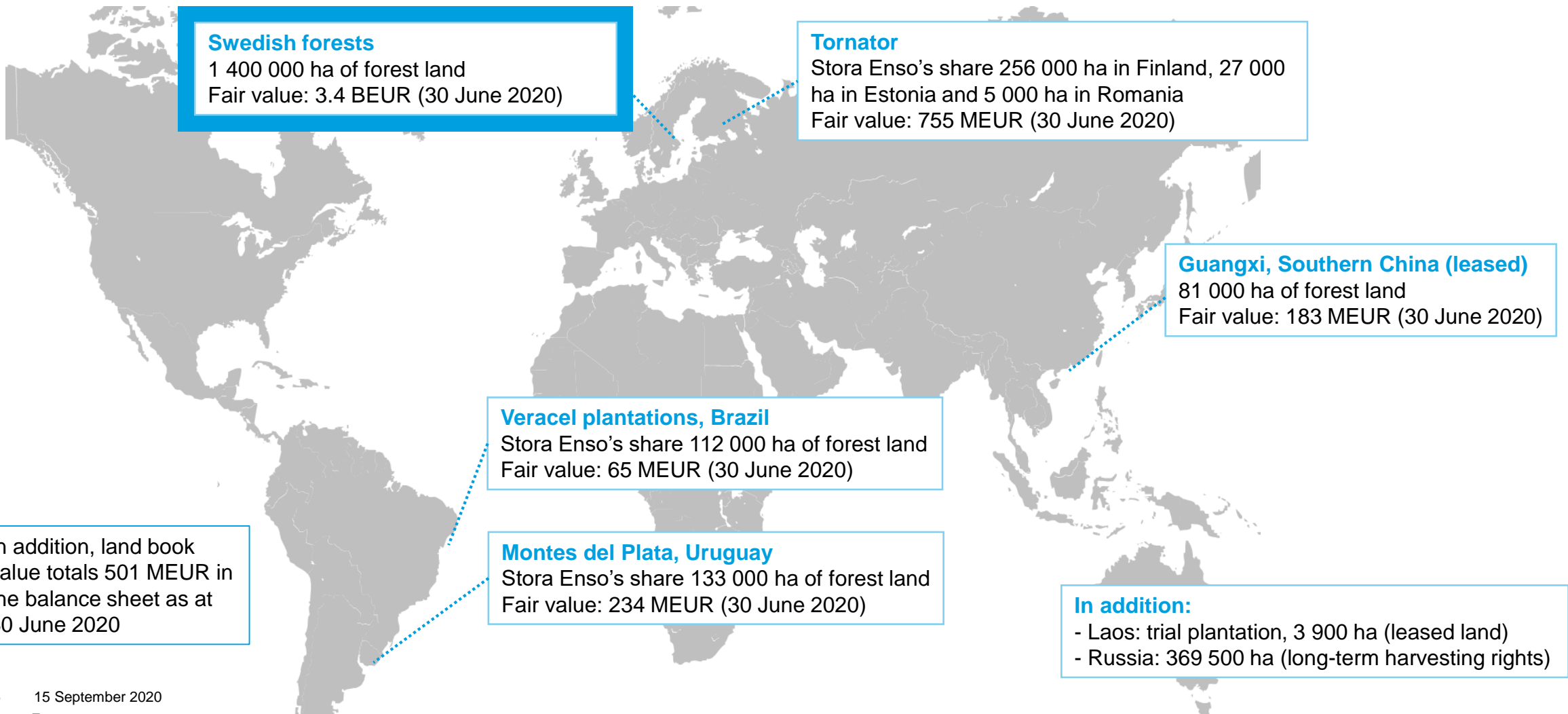


Paper
No changes

New divisional structure as of 1 January 2020

We are one of the largest private forest owners in the world

Total biological asset value in balance sheet ~ 4.6 BEUR



Substituting materials from finite resources is our key competitive advantage



Our products substitute fossil-based products, saving **20 Mt CO₂**

Our total climate benefit:

12
Mt CO₂

Resource efficient value chain, emissions: **11 Mt CO₂**



Our forests are carbon neutral and absorb **3 Mt CO₂**

Wood-based materials offer a better alternative to fossil-based and other non-renewable materials



Ending the era of fossil-based materials

Innovation projects with high potential impact to transformation



**Bio-barriers,
MFC films**



Liquid and food packaging

**Native and
modified MFC**



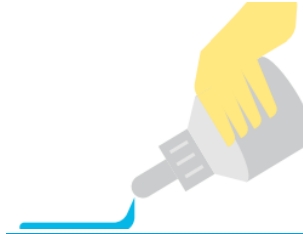
Specialty papers, nonwovens, personal and home care, barrier materials

**Intelligent
packaging**



Sophisticated applications to brand owners and supply chains

**Lignin for phenol
replacement**



Reduction of fossil raw materials in adhesives

**Dissolving pulp to novel
cellulose materials**



Textiles and nonwovens

**Bio-based carbons for
energy storage**



Anode material for batteries, activated carbon for double layer capacitors

**Bio-based
plastics**



Chemical intermediates

Biocomposites



Replacing fossil-based plastics in composites

**Carbon
fiber**



Sports and leisure, wind energy, automotive, aviation

**R&D expenditure in 2019
EUR 141 million**

Lignin – big opportunities in many markets



4 Mt of lignin in our pulp mill out of which
350 kt readily extractable



Biobinders



Carbon fiber



Bio-based carbons

Innovation initiative – Bio-based carbons for energy storage



BUSINESS LOGIC

Enter the fast growing battery materials market with lignin based hard carbon designed for anodes

MARKETS



Electric mobility



Power storage



Tools / personal electronics

VALUE



Renewable



Higher power density



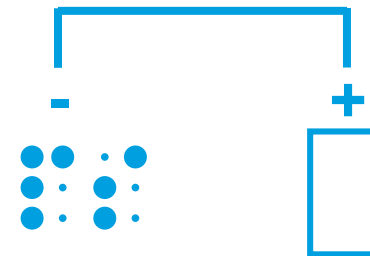
Faster charging

Better cold crank

Safer

SOLUTION

Lignin-based hard carbons for battery anodes in Li-ion batteries



CAGR
30%

1.6 Mt
market
in 2030

Market
share
~5-6%

Biobinders for construction and furniture

Sales potential 200 MEUR in next 10 years



Markets



Construction & Insulation



Furniture

Value



CO₂ Sustainable



Bio-based



Safe/Healthy living

Solutions

- Lineo™ by Stora Enso for phenol replacement
- FFB for formaldehyde and phenol replacement
- FF coating for metal coatings



Phenolic resin market
CAGR
4%

20+
BEUR market
in 2030

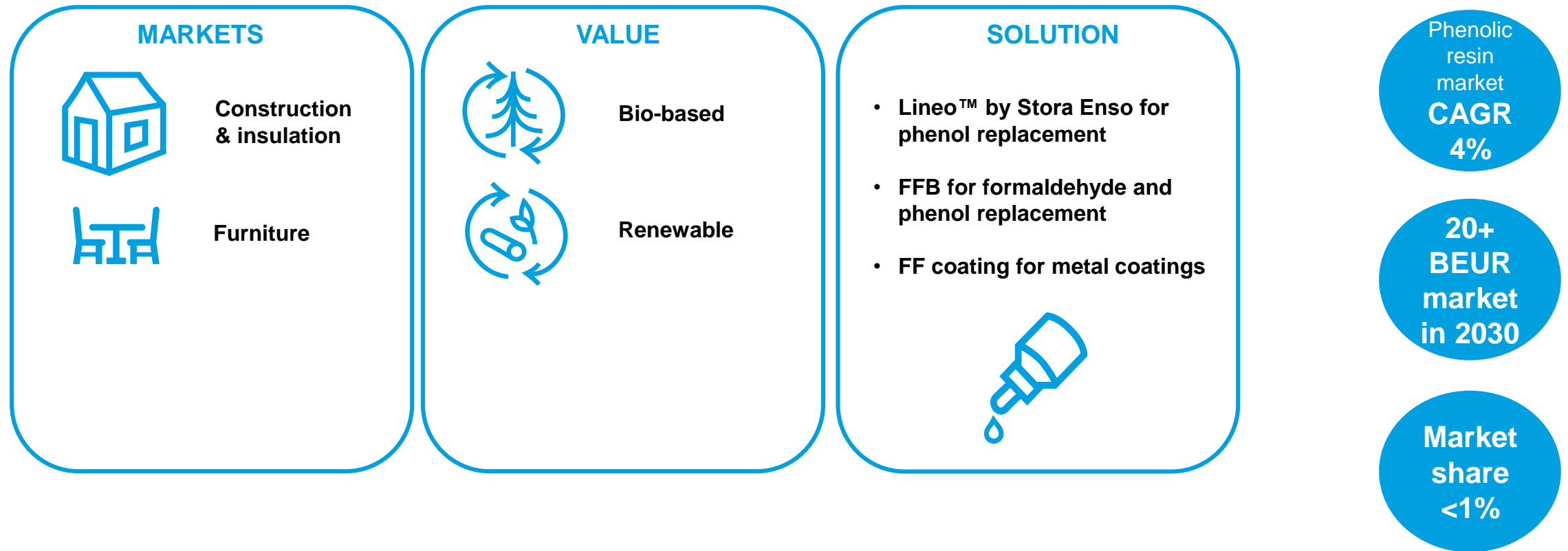
Market share
<1%

Innovation initiative – Biobinders for construction and furniture



BUSINESS LOGIC

Answer to the need of formaldehyde free interior and construction products impacting the indoor air quality



Innovation initiative – Carbon fiber from trees



BUSINESS LOGIC

Produce lignin and cellulose based carbon fibres, in partnership with carbon fibre producer or as precursor supplier

MARKETS



Automotive



Aerospace



Wind energy



Construction

VALUE



Bio-based



Renewable

SOLUTION

- Cellulose and lignin-based carbon fiber to replace fossil-based carbon fibers

OR

- Cellulose and lignin-based precursor to replace PAN (Polyacrylonitrile) precursor

Carbon fiber market
CAGR
8%

4
BEUR
market
in 2030

Market
share
5%

Innovation initiative – Biofoams



BUSINESS LOGIC


Replace fossil based polymer foams in cushioning applications for packaging with a fibre based solutions

MARKETS




Cushioning foams in packaging


VALUE




Bio-based



Renewable



Recyclable




Biodegradable

SOLUTION

Sustainable, wood-based cushioning to transform how we get products safely delivered.

Replaces fossil-based polyethylene (PE) and polystyrene foam materials.



Packaging Foams CAGR 6%

25 BEUR market 2030

Market share 1-2%

Clothes made of wood, dissolving pulp for the textile industry

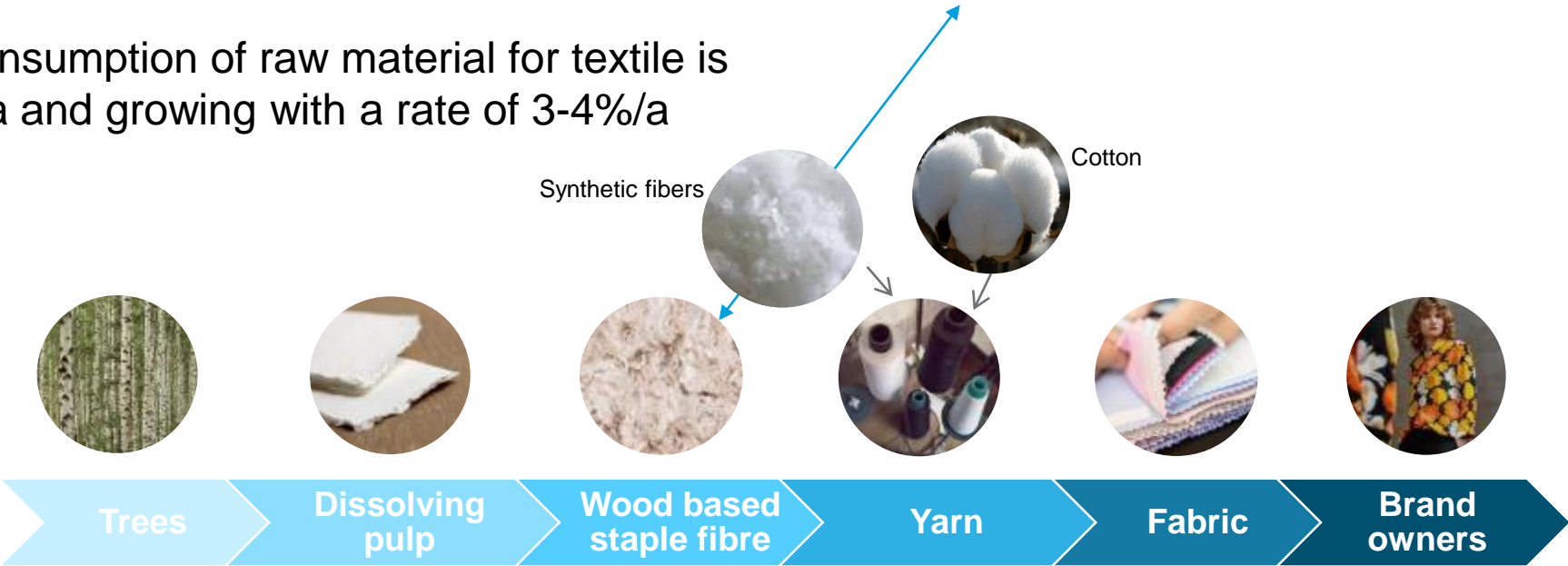


Consumers and brand owners in the textile end-use segment are looking for renewable and more sustainable fibers to substitute cotton and oil-based fibers like polyester

Stora Enso has increased dissolving pulp production capacity at Enocell Mill to 430 000 t/a

Partnership in TreeToTextile, a joint venture that develops a new woodfiber-based staple fibre process

Overall consumption of raw material for textile is > 100 Mt/a and growing with a rate of 3-4%/a



Recent progress



Carbon for energy storage
pilot in building, commencing
Q1/21



**Bioplastic pilot
(FDCA)** building pilot,
commencing Q2/21



**Formaldehyde free
binder** product ready
for few segments



Tree to textile Pilot
scale completed,
demo stage planning
began



Carbon fiber
scaling with
Cordenka
(Piloting)



BioFoams pilot
building began,
commence Q4/21

POWER OF A TREE

Creating value in the bioeconomy

THE RENEWABLE MATERIALS COMPANY

Biomaterials division

Solutions for various end-use applications



Our various pulp grades



...are transformed by our customers into packaging, paper and tissue.



...are used for the manufacturing of hygiene products.



...are used in the textile industry, but also in the food and pharmaceutical industries.



...are used as raw materials in the adhesive and cosmetic industries, among others.