



# Norske Skog

Sparebank 1 Digital Energy Conference 2021

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[www.norskeskog.com](http://www.norskeskog.com)

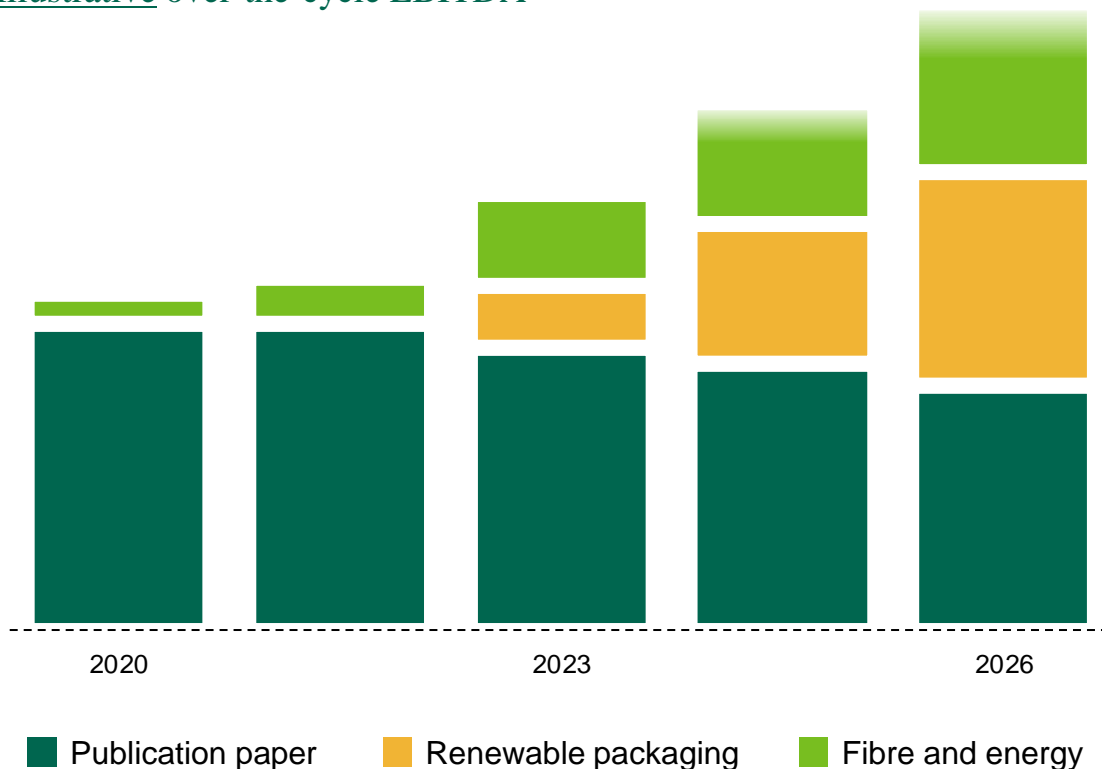
# Introduction to Norske Skog

- Global and sustainability focused industrial company
- Best-in-class industrial assets and high fibre competence
- World-leading producer of publication paper
- Strategic shift into growing and high margin markets
  - ✓ *Recycled containerboard (765,000 tonnes)*
  - ✓ *Wood pellets (90,000 tonnes)*
  - ✓ *Waste-to-energy plant (400 GWh)*
  - ✓ *Largest shareholder in Circa Group (32%<sup>1</sup>)*
  - ✓ **CEBINA and CEBICO**



# Strong focus on green growth projects

Illustrative over-the-cycle EBITDA



**Diversify and innovate within fibre and energy**

**Become a leading producer of renewable packaging**

**Improve and optimise publication paper cash flows**

# Norske Skog Saugbrugs is a leader within fibre and process industry competence directed towards sustainable products for the future

## Products developed at Norske Skog Saugbrugs target the Sustainable Development Goals



- Significant fibre and process industry competence held by staff at the mill
- Fibre and energy projects being developed in parallel with SC magazine production
- Bio gas facility constructed in 2016, producing bio gas fuel from production related waste materials
- CEBINA and CEBICO have been developed for more than 10 years in a mill-wide effort
- Several other promising projects being explored

# Produced at Saugbrugs from renewable fibre and hydro energy



- Research on nanocellulose started in 2006
- Originally developed as strength enhancer in paper
- Production and development of CEBINA since 2017
- Significant commercial work during 2019 and 2020
- Collaboration with technical partners and customers
- First commercial sales in Q4 2020 (proof of concept)
- Target international distribution agreement in 2021
- Pilot plant with capacity of up to 500 tonnes dry CEBINA
- Reviewing capex-efficient upscaling opportunities

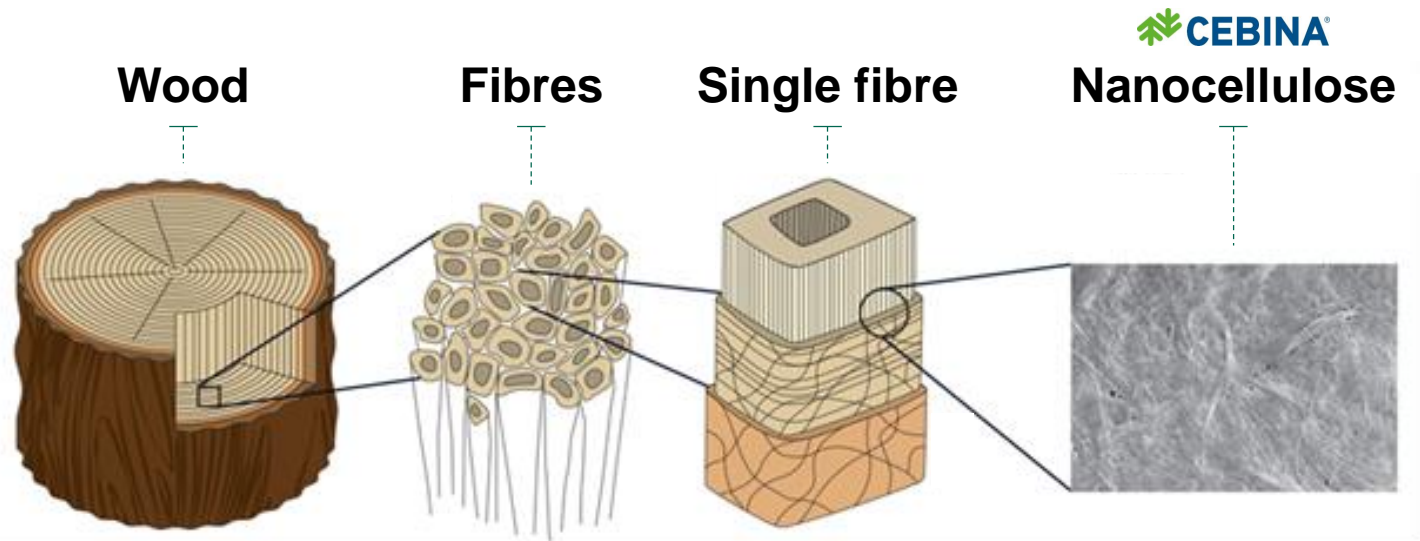
# Sustainable and renewable alternative to harmful substances

Highly useful product properties...



Water turns into solid paste when adding small quantities of CEBINA

... achieved by refining renewable wood fibre



Nanocellulose can replace fossil and harmful substances in multiple applications where few alternatives are available today

# Environmentally friendly input factor for a range of applications

## Epoxy coatings



- ✓ Commercial sale achieved
- ✓ Better environmental footprint
- ✓ Alternative is harmful to workers
- ✓ Better cost efficiency

## Paint for walls



- ✓ LOI with industry partner
- ✓ Better environmental footprint
- ✓ Better cost efficiency

## Glue for fibreboards



- ✓ LOI with industry partner
- ✓ Improved strength (armouring)

## Drilling mud and IOR



- ✓ Work with North Sea operator
- ✓ Work with drilling mud supplier
- ✓ Increased oil recovery



# Replacing fumed silica in thermoset coatings

CEBINA MB EP proving high efficacy in coatings



*CEBINA MB EP is a refined non-aqueous paste where CEBINA is dispersed in an epoxy solution*

- Based on renewable and natural wood fibre
- Time saving (can be used for both level and tilted floors)
- Eliminates need for fumed silica
  - ✓ No dust when mixing
  - ✓ Improves worker health
  - ✓ Reduces cleaning time

Solberg Gulv & Industribelegg AS

*“The CEBINA product floats well on horizontal surfaces and works very well on walls. CEBINA saves preparation time when laying floors, and removes health challenges with existing products.”*

**Jørn Solberg, owner and managing director**



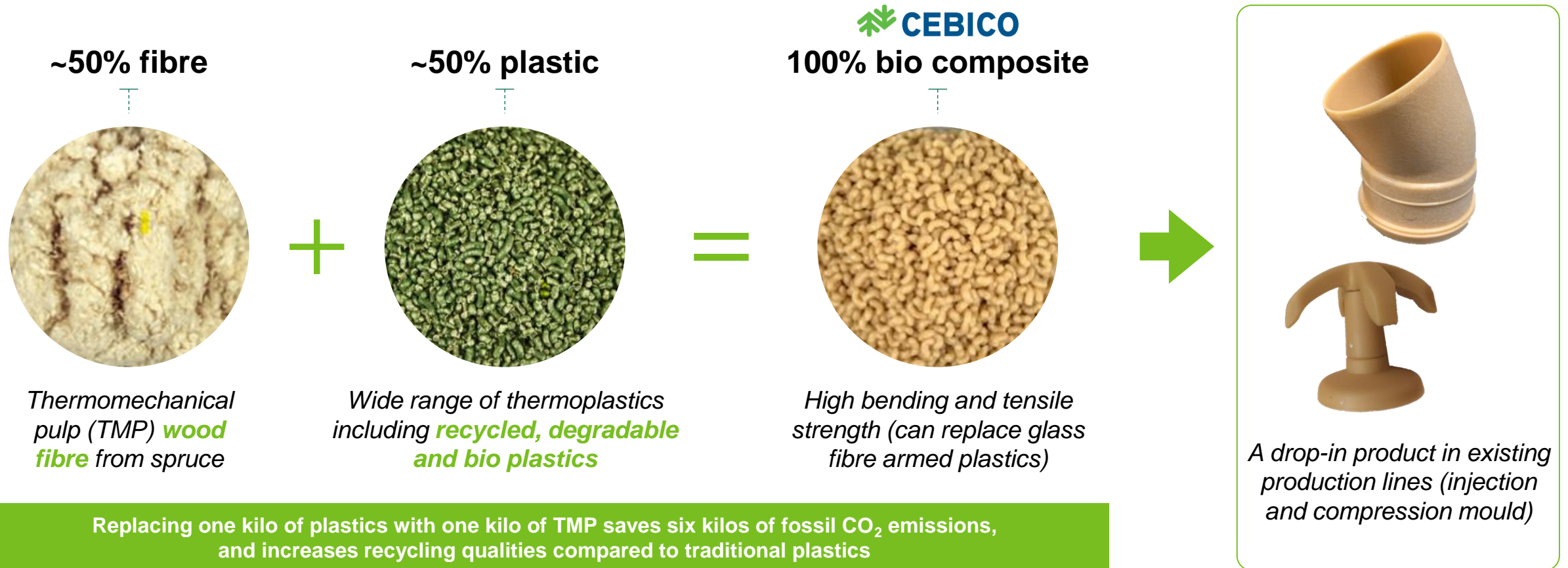
# Norske Skog has developed bio composites at Saugbrugs since 2015

Replace plastics with sustainable fibre

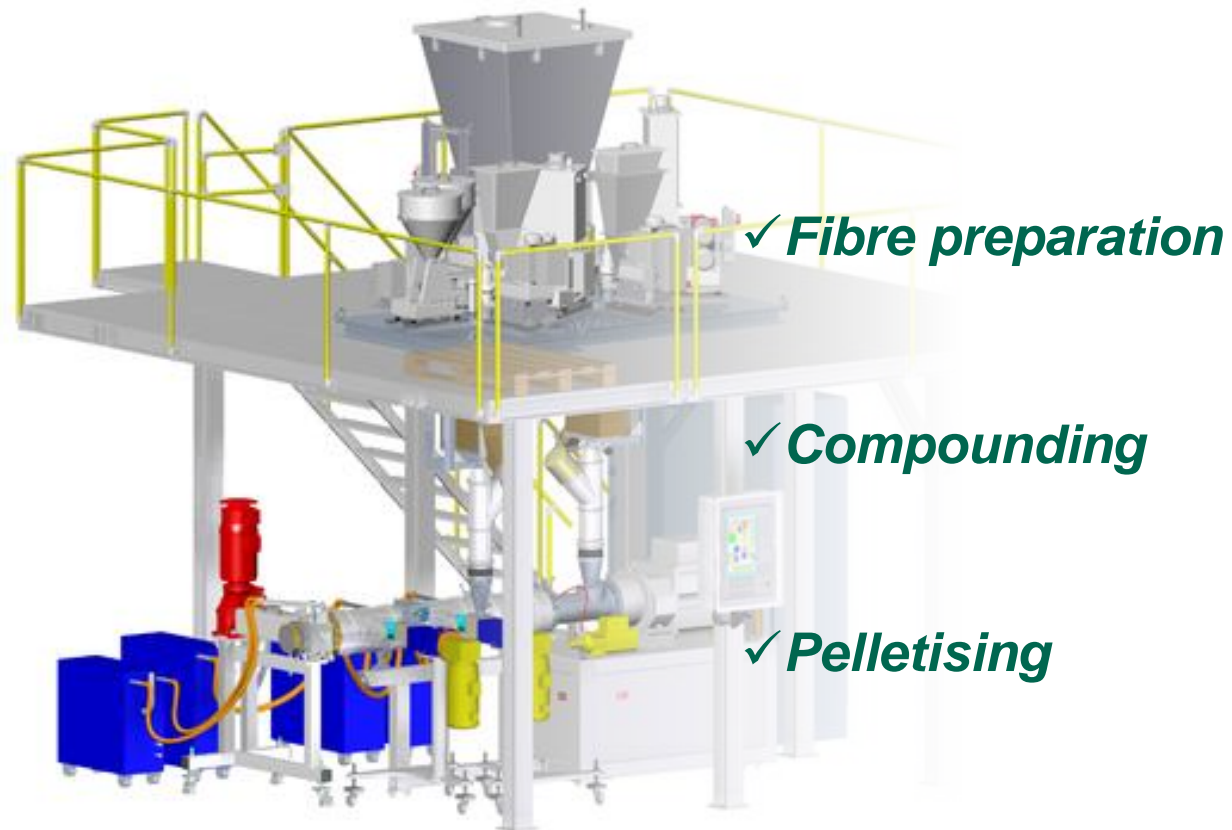


- Global use of plastics exceeds 350m tonnes
- Bio composites currently represent only 1-2% of the market
- Range of relevant applications (furniture, automotive, construction, logistics)
- Demand driven by better performance and environmental profile
- Qualification testing and commercial development in 2021 and 2022

# Sustainable material with competitive cost and performance



# Pilot plant enables further commercial development and testing



- Annual CEBICO capacity of ~300 tonnes
- Expected operational from Q3 2021
- Can also be used for CEBINA MP production
- To be located at the Saugbrugs mill
- Accelerate commercial development
- Supported by Innovation Norway with NOK ~15m

# Bringing renewable and sustainable solutions to market

 **CEBINA**<sup>®</sup>



 **CEBINA**<sup>®</sup> | MB  
EP



 **CEBICO**





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