Norske Skog

BCTMP study starts at Norske Skog Saugbrugs

A project for the future

www.norskeskog.com

A well invested plant

- **A large producer of SC magazine paper**
  - 200 000 t/y of paper on 2 PM
  - PM4 100 000 t/y
  - PM5 100 000 t/y
  - PM6 260 000 t/y (landslide April 2023)

- **Strong efficiency development**
  - Focus on new paper and fiber products
  - Great track record in continuous improvement
  - Material energy efficiency last 10 years
  - Continuous industrial development
  - Well invested mill through decades
  - Leading integrated mechanical pulp mill
  - Low CO2-footprint
  - Effective wastewater treatment plant

A site for the future

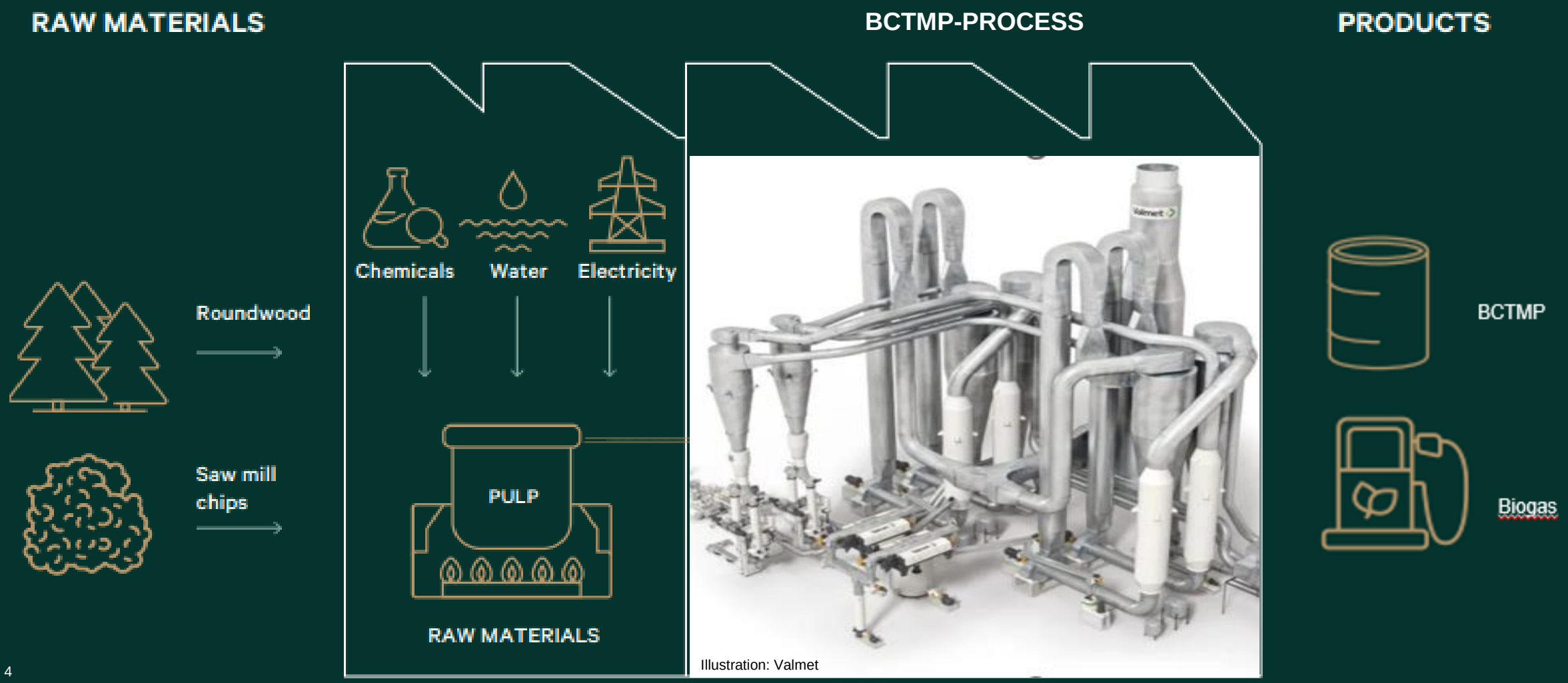
- 40ha site and large surrounding real estate
- 280 MW electric grid capacity directly to site
- Norway's largest biomass boiler of 70 MW_{th}
- Biogas production

- Low cost TMP capacity of 400kt with heat recovery
- Developing the CEBINA and CEBICO bio products
- 400 skilled employees
- Good infrastructure for road, rail and sea transport

- Access to significant pulpwood supply
- Long-term contract with Statkraft of 100 MW
- Abundancy of fresh water supply
- Modern effluent treatment of production waste

What will we build?

- Exploit existing infrastructure – new BCTMP-process plant



Competitive advantages

- Low capex and operational costs

- Effective fibre processing and reuse of existing equipment and infrastructure
  - TMP-fibre processing, bleaching and washing process
  - PM6 bleach plant
- Low operational costs and chemical consumption
- Benchmark in energy efficiency
- Effective refining
  - High pulp strength
  - Good utilization of raw material
  - High bulk with minimal shives content
- Four washing stages gives clean pulp
- Optimal bleaching process providing good brightness and lower costs
- Automated finishing processes

Why do we invest in BCTMP?

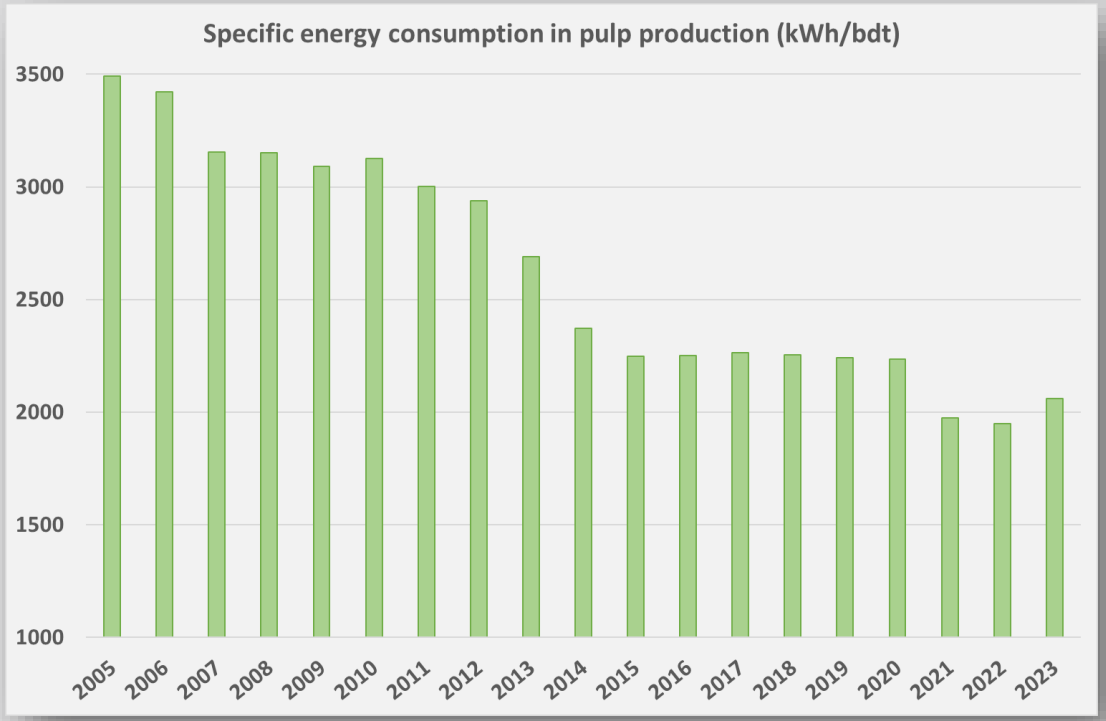
- A new BCTMP (Bleached Chemi-ThermoMechanical Pulp) plant at Saugbrugs will produce and sell products to a growing market for packaging and hygiene articles.
- The sale products will have favorable cost base due to low investments and the utilization of existing production equipment and infrastructure.
- BCTMP production will be profitable and secure Saugbrugs' future in a growing market.
- Good location, high expertise, well-developed cooperation with forest owners, and low emissions will provide BCTMP at Saugbrugs with competitive advantages.

High fibre competence is the key to success

- Strong operational competence evolved from R&D-functions
- Broad and diverse engineering expertise
- Development program to educate more PhD graduates
- Many employees hold master's and bachelor's degrees in production, maintenance, and administration
- Most process and maintenance operators are recruited with a background as apprentices
- The majority of TMP operators have completed certified operator training
- Several have developed high expertise in nanocellulose and biocomposite materials
- Every year, around 15-20 new apprentices are recruited

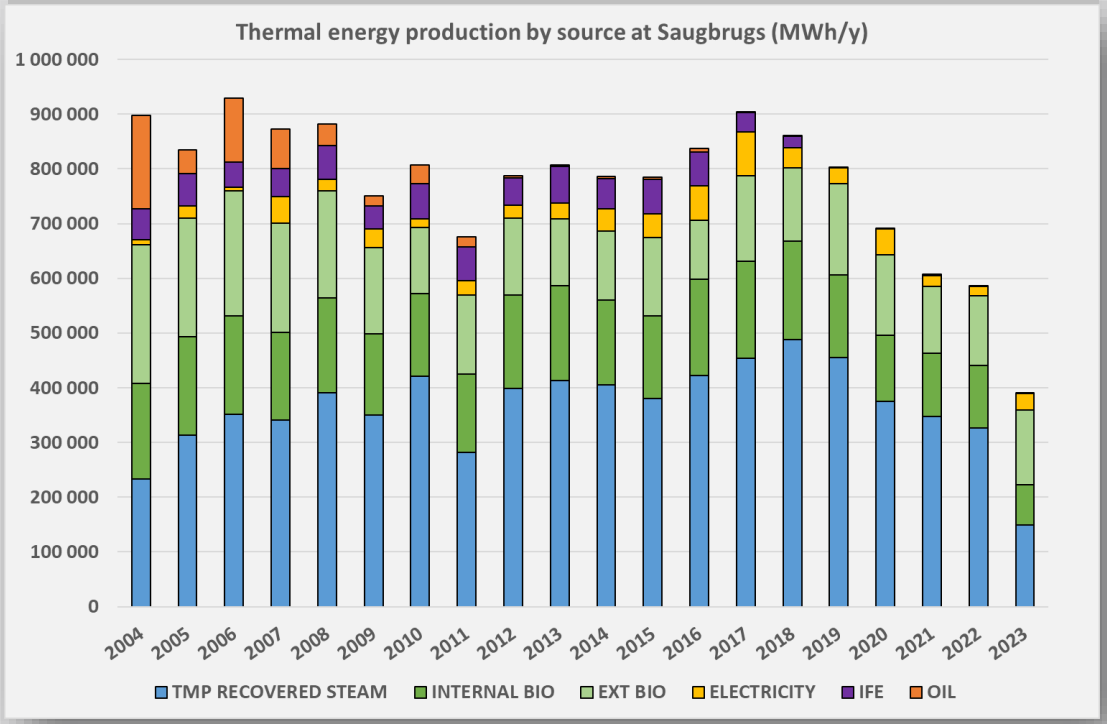
Solid results from optimising energy efficiency

Electrical energy efficiency



- Specific energy consumption in fibre treatment down ~45%
- Industry leading electrical energy efficiency
- ENOVA (state agency) supported investments

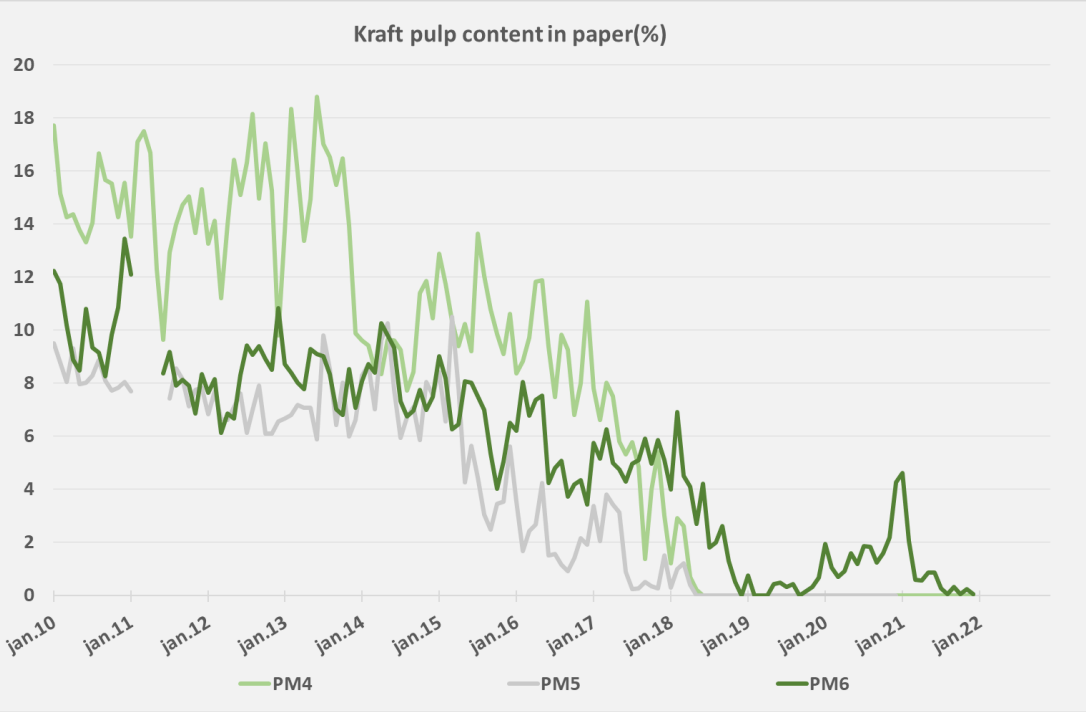
Thermal energy efficiency



- Significant increase in regenerated steam from TMP-production
- Thermal energy more than 99% from renewable sources
- Steam share (tmp and internal bio) increased from 45 to 80%

Solid results from optimising raw material efficiency

Fibre efficiency



- Almost eliminated expensive kraft pulp consumption
- Increased use of internally produced TMP fibre
- Wood consumption at 700,000 m3/y

Chemical efficiency

- Fillers replaced with calcium carbonate from Molde
- Reduces both cost and chemicals consumption
- Increased and improved paper brightness

Large capacity of green energy and

- Norways largest bio boiler 70 MW
- Fired with bark and sludge
- Access to competitively priced demolition wood
- Well suited for carbon capture
- 100% biobased thermal energy for BCTMP

waste water treatment

- Biogas production with 2,8 MNm3/y capcity
- Long-term delivery contract with AGA
- Installed COD removal capacity
  - Anaerobic 40 t/d
  - Aerobic 60 t/d
  - Total 100 t/d
- Currently utilizing around 10-20 t/d

Expansion of Norske Skog Saugbrugs' product portfolio

- All based on prosessing of fresh fibre

BCTMP – bleached pulp

Carton

Tissue

Other

SC paper

Bio composites

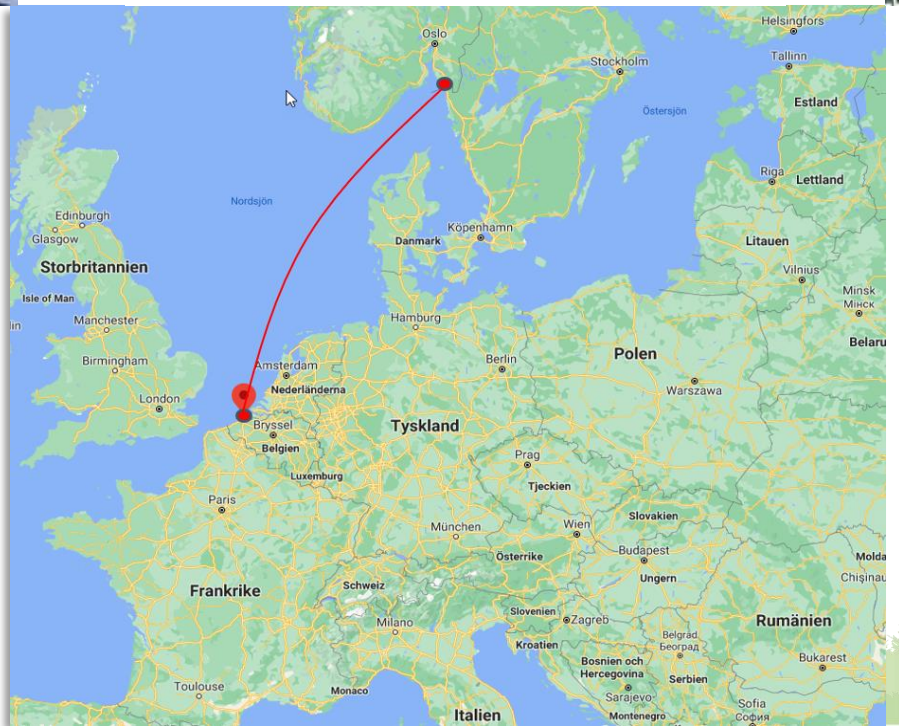
Nanocellulose

Proximity to many Scandinavian producers of cartonboard and tissue

Low-cost transportation to European markets

Norske Skog Saugbrugs operates its own port in Halden with outbound logistics by truck and boat

Competitive freight cost on truck delivery going south (return freight from Oslo), especially to northern Germany and Poland



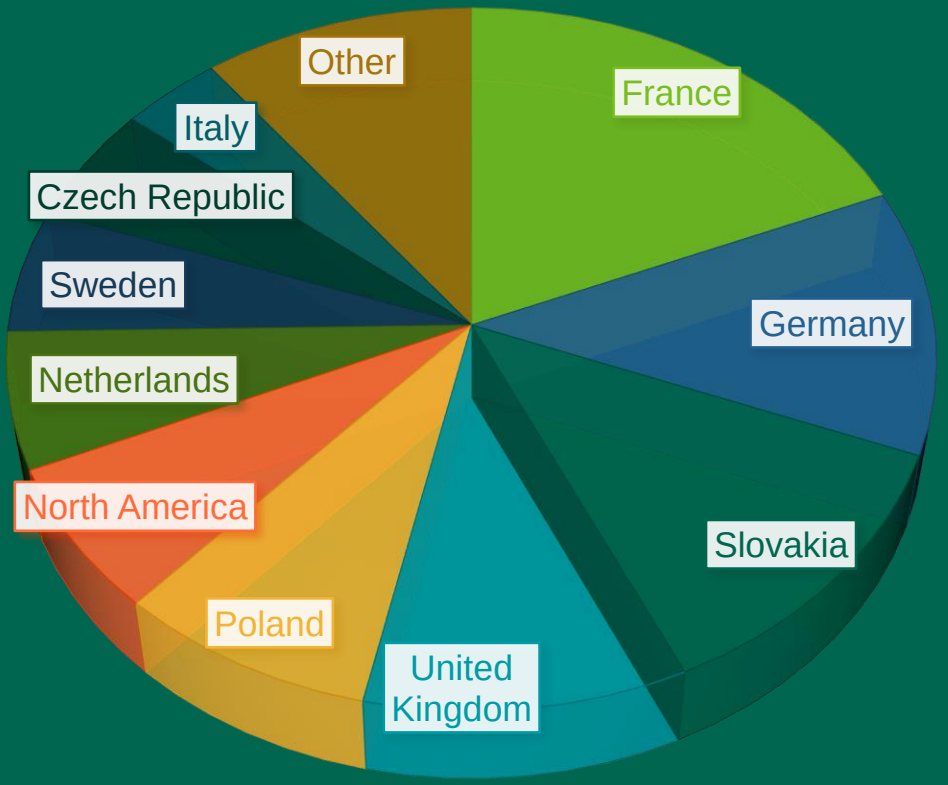
Vessel operated by DFDS going Uddevalla/Zeebrügge/Immingham

Combined logistics solution for paper and BCTMP deliveries in one vessel would give a very high utilization rate towards central Europe

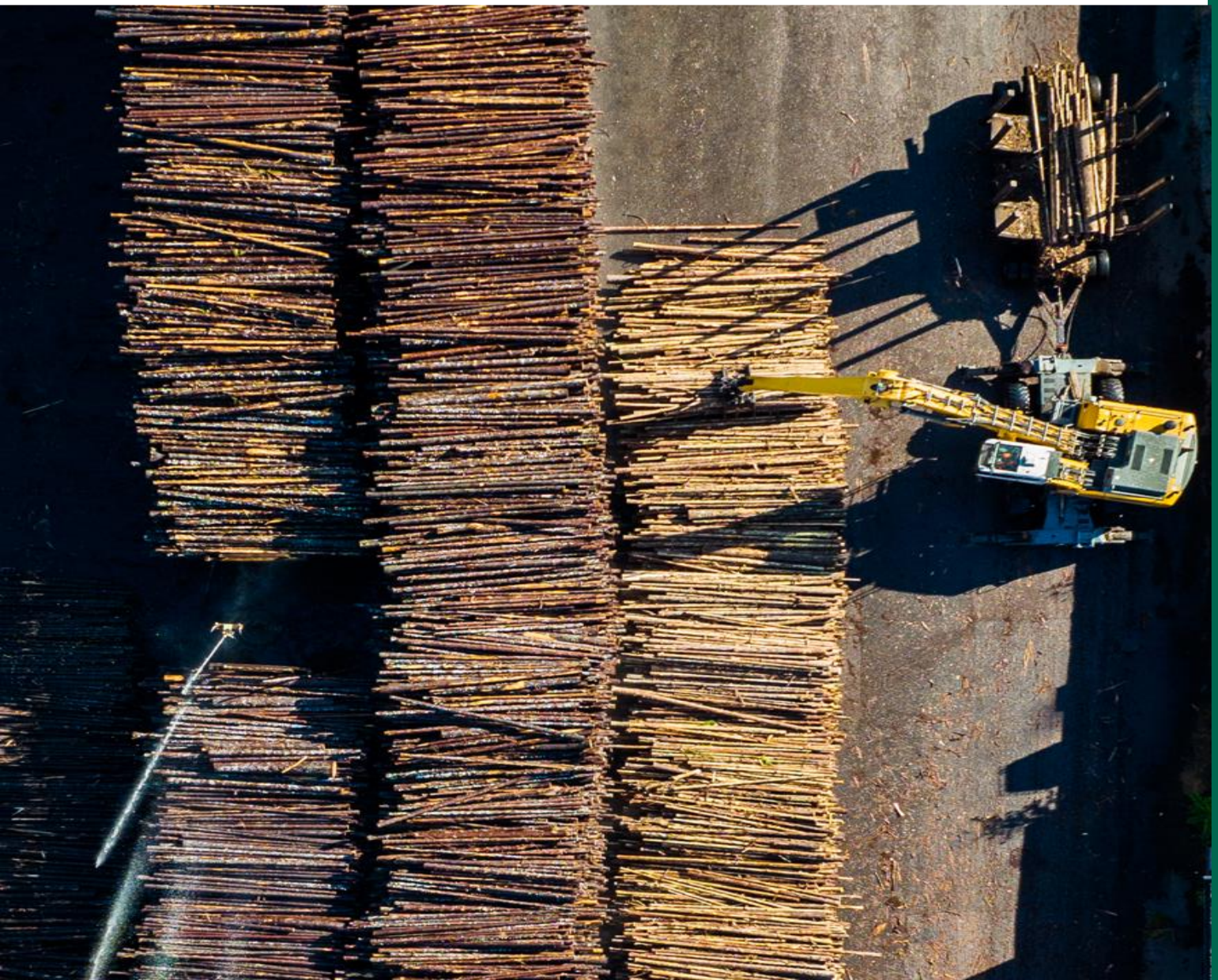
Top 10 shipments from Saugbrugs

- Just in time delivery to numerous paper customers world-wide

Norske Skog



We are competitive, we will invest in BCTMP



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Q&A