



storaenso

Biogenic CO₂ for P2X

Opportunities for biogenic CO₂ utilization

Northern Power business forum, Oulu, 14.2.2024

Stora Enso in brief

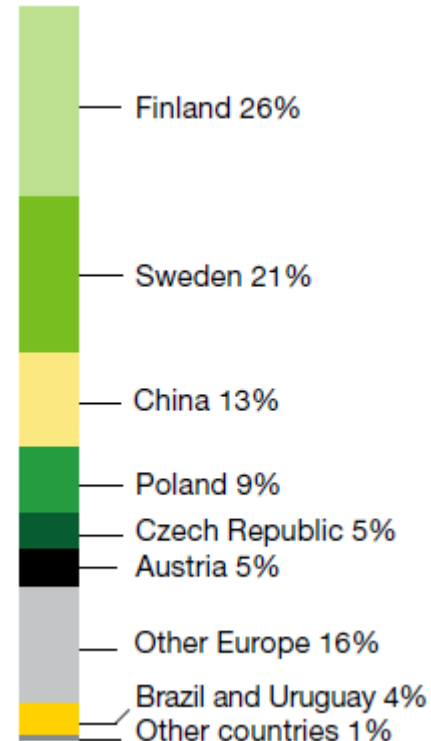


Sales 2023
EUR 9.4 billion

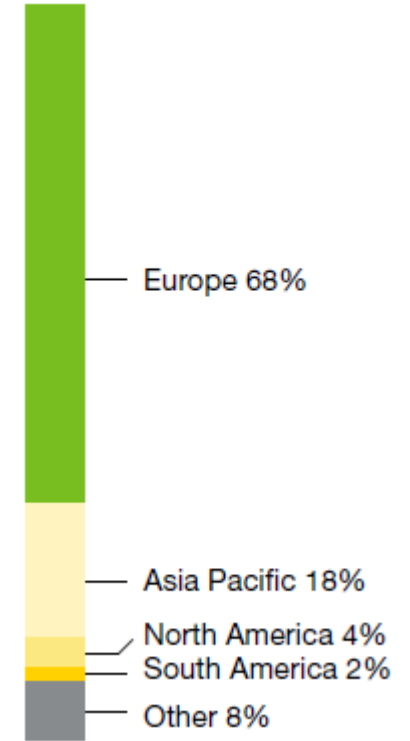
Employees 2023
21 000

**Shares listed
on Nasdaq in
Helsinki and
Stockholm**

Employees by country^{1,2}



Sales by destination²



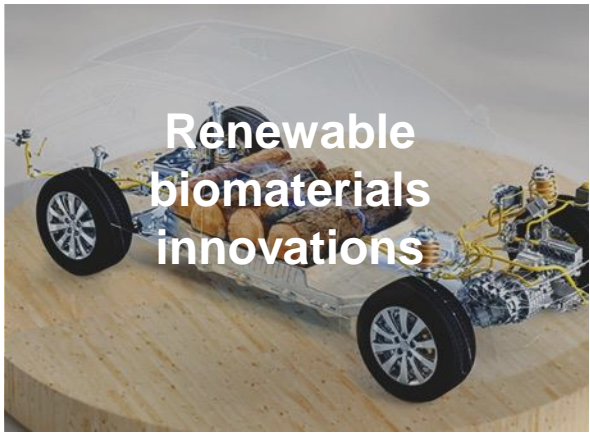
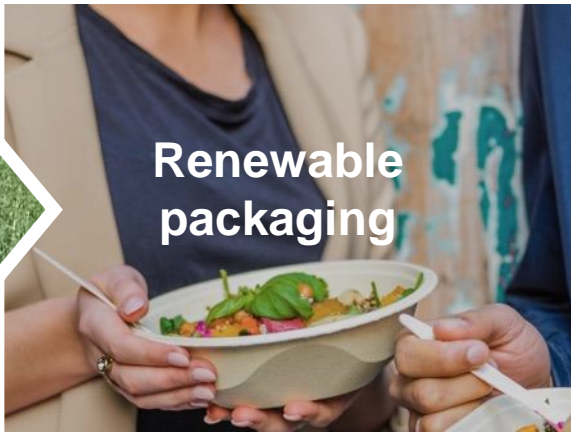
¹ Including 50% of the employees at Veracel in Brazil and Montes del Plata in Uruguay.

² Based on 2022.

Shaping our business for higher growth and value



storaenso

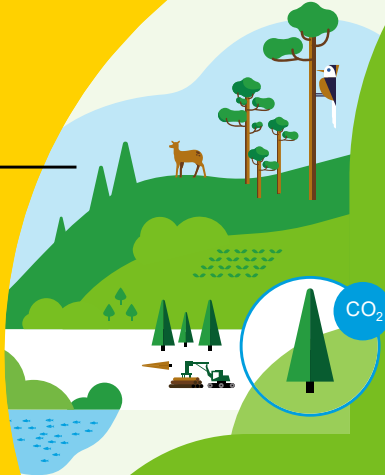


Our goal 2050

100%
regenerative
solutions



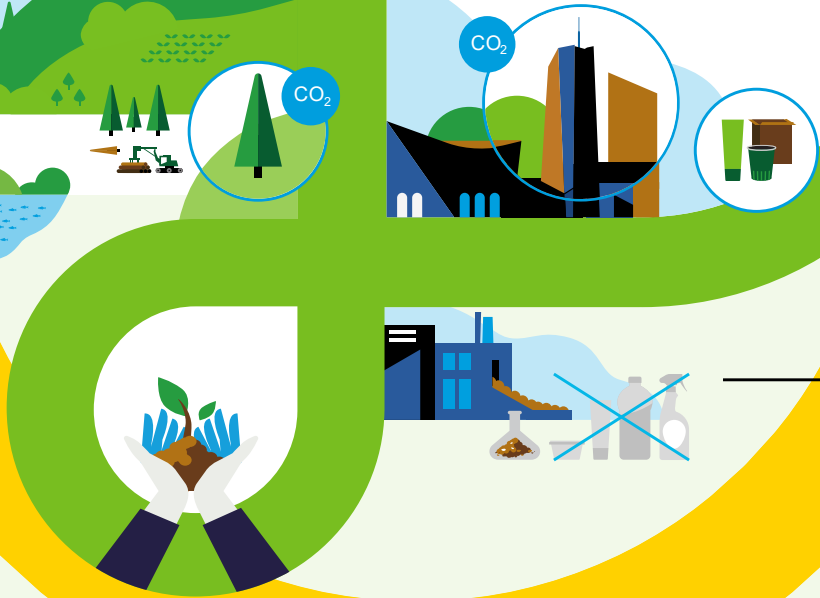
Biodiversity
net positive



100% circular



Carbon net positive





Carbon capture – Long-term possibility?



- Stora Enso's ambition is to contribute on mitigating climate change and substitute materials from finite resources
- Capturing **biogenic CO₂** and storing it permanently, or utilizing it as a building block for eFuels and chemicals, can mitigate climate change and substitute fossil-based materials
- Biogenic CO₂ and carbon capture in general have potential according to various climate scenarios (IPCC, IEA):
 - It is needed for long-term storage to drive the CO₂ levels down, but also
 - it is needed to decarbonize hard-to-electrify sectors such as shipping and aviation.

Biogenic CO₂ - storage or utilization?

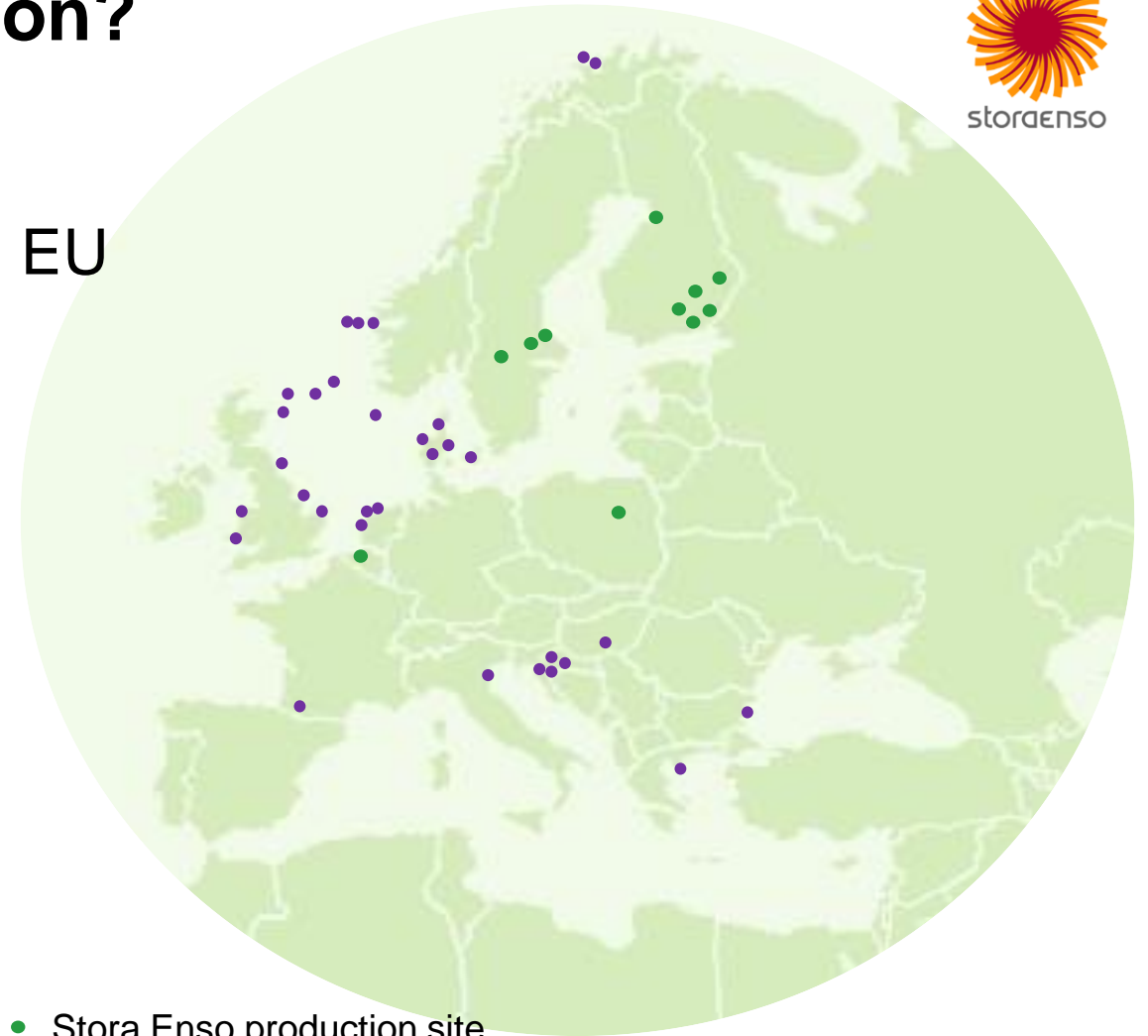


11 Pulp, Board & Paper producing units in EU
~10 Mton of biogenic CO₂ annually

Different possibilities for CO₂ use:

- Utilization on-site
- Utilization off-site
- Long-term storage

.. No *one-size-fits-all* solution



- Stora Enso production site
- CO₂ storage development project



Opportunities in on-site utilization

Power-to-X



- Heat and other utility synergies with Power-to-X unit
 - Capturing CO₂ is an energy intensive process
 - Waste heat utilization through heat pumps
- No need to transport and liquify CO₂
 - Transportation typically the most expensive
 - Liquefaction increases energy demand
- Better visibility for CO₂ value chain
 - Potential to operate in a more flexible way

Current activity in CO₂ capture


Publicly funded projects

Horizon 2020 - **ACCSESS** 

- Demonstrating improved CO₂ capture technology in a pulp mill

Business Finland - **Forest CUMP** 

- Demonstrate CCU proof-of-concept from forest industry CO₂

Business Finland - **BioCCU** 

- Creating up-to-date information about CCU applications



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



storaenso



THE RENEWABLE MATERIALS COMPANY



storaenso



THE RENEWABLE MATERIALS COMPANY