



Stora Enso supports customers to meet consumers' demand for sustainable products based on renewable materials. Our solutions offer low-carbon alternatives to products based on finite resources.

# Strategy

Part of Stora Enso's Annual Report 2020



THE RENEWABLE MATERIALS COMPANY



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Our renewable products provide a sustainable alternative to fossil-based materials.



Stora Enso's formed fiber products help customers to replace plastics. The salad bowl made of PureFiber™ by Stora Enso is plastic-free, recyclable and made of renewable materials. The PureFiber™ product line enables approximately 75% lower CO<sub>2</sub> footprint compared to alternative packaging materials, such as plastic or bagasse.



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# This is Stora Enso

Part of the bioeconomy, Stora Enso is a leading global provider of renewable solutions in packaging, biomaterials, wooden construction and paper. We employ some 23 000 people and have sales in more than 50 countries. Our shares are listed on the Helsinki (STEAV, STERV) and Stockholm (STE A, STE R) stock exchanges.

Our fiber-based materials are renewable, recyclable, and fossil free. Our solutions offer low-carbon alternatives to products based on finite resources. We believe that everything that is made from fossil-based materials today can be made from a tree tomorrow.



**We are the renewable materials company**



Our raw material is renewable, recyclable, and fossil-free.



Our products replace fossil-based materials.



Our renewable products contribute to a circular bioeconomy.

# Serving markets around the world

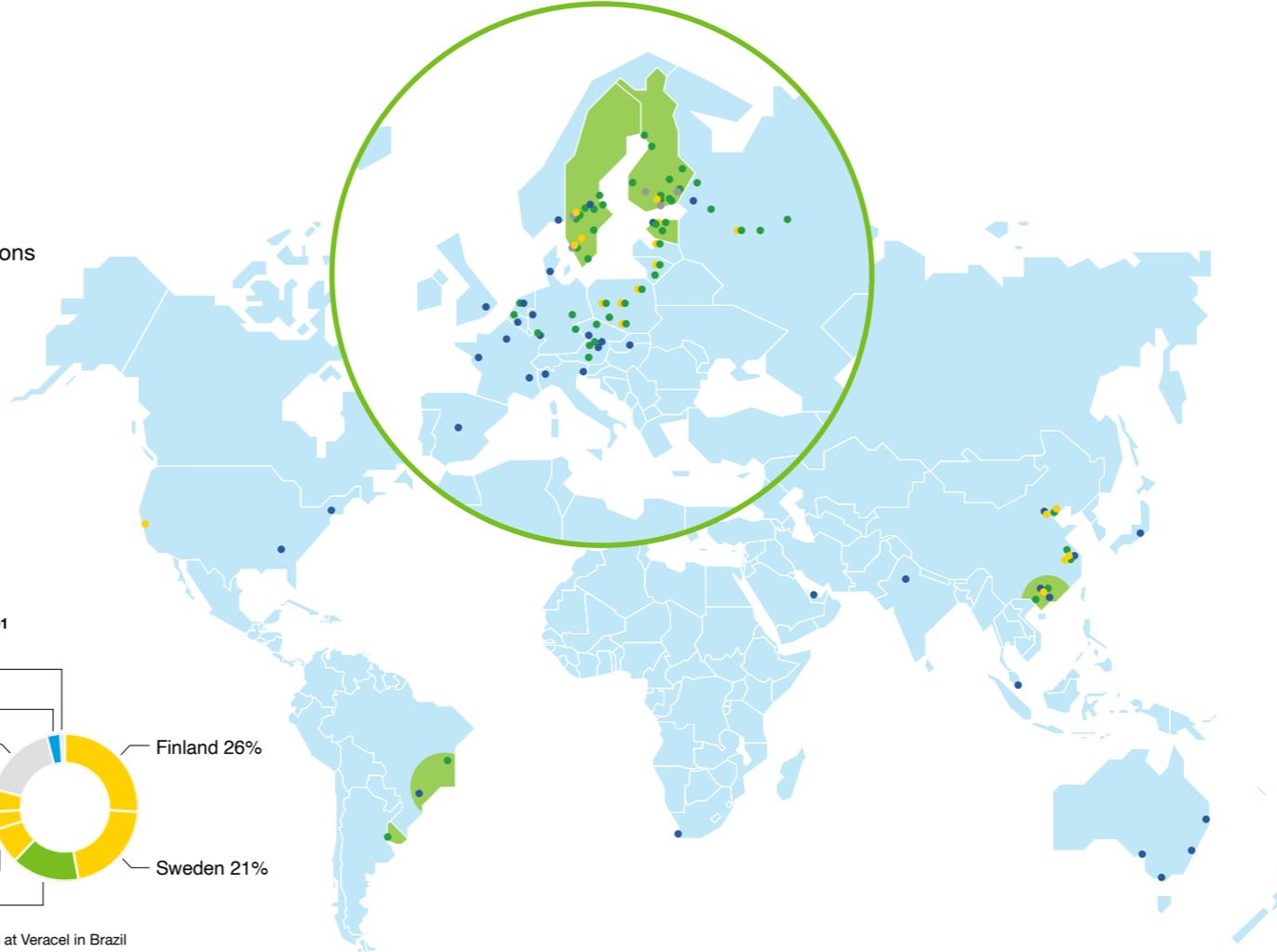
Stora Enso operates worldwide and focuses on utilising its expertise in renewable materials and creating value in packaging, biomaterials, wooden construction, and paper. We combine global resources with local presence, service and sustainability.

Sales  
**EUR 8.6 billion**

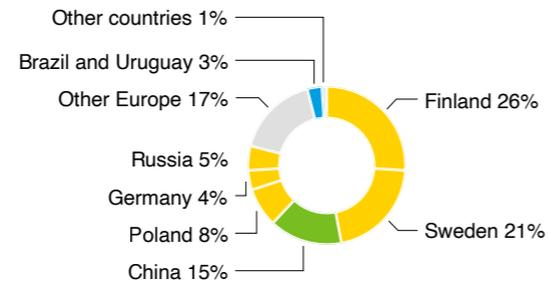
Countries  
**50**

Employees  
**23 000**

- Production unit
- Sales office
- Design Studio
- Innovation Centre
- Forests and plantations

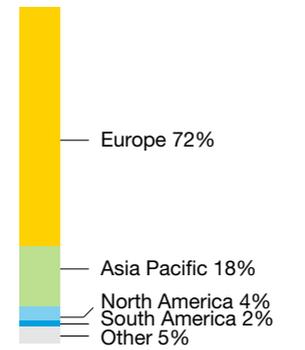


### Personnel by country<sup>1</sup>

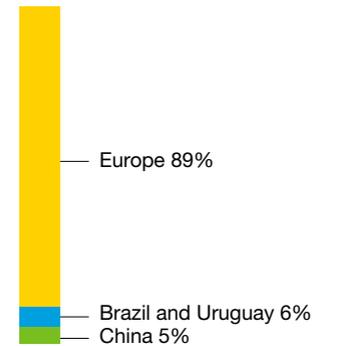


<sup>1</sup> Including 50% of the employees at Veracel in Brazil and Montes del Plata in Uruguay.

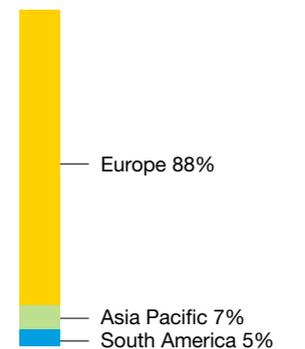
### Sales by destination



### Sales by origin



### Purchases by region



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# Stora Enso in 2020

## Meeting consumer demand for eco-friendly and circular solutions.

Operational ROCE  
excl. Forest

# 7.0%

(Target >13%)

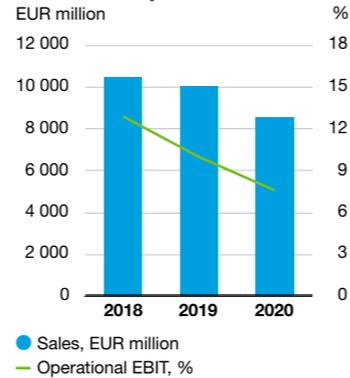
Climate impact

# -11.5

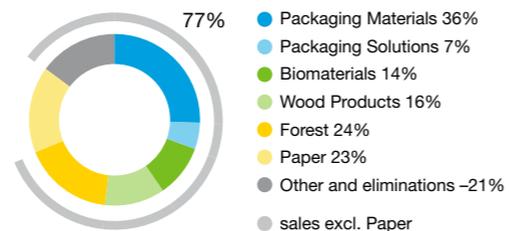
 million tonnes of CO<sub>2</sub>e

(annual estimate)

Sales and operational EBIT



Sales by business





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# Highlights of 2020



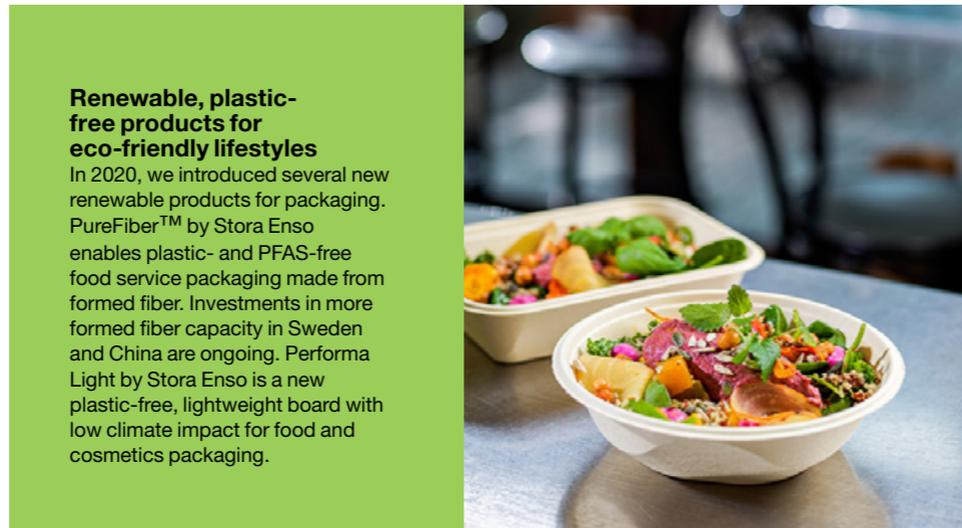
### Growth in premium and low-carbon packaging

As the demand for sustainable packaging in e-commerce and food applications is increasing, we enable growth by converting production at our Oulu Mill from paper to kraftliner. The conversion strengthens our offering in the growing packaging business and is a major step forward in our transformation. The production of AvantForte™ by Stora Enso on the converted line started in the beginning of 2021. AvantForte™ is a strong, premium quality kraftliner that meets our customers' need for high-performing, safe and plastic-free packaging while using less material.



### Exploring expansion of consumer board production

Stora Enso is conducting a feasibility study for possible expansion of pulp and board production at its Skoghall Mill in Sweden. The investment would allow us to meet the increasing demand for sustainable packaging among consumers. It would also bolster profitable growth in, for example, liquid packaging board and other packaging grades such as CKB. Skoghall Mill is ideally located in the proximity of Stora Enso's forests in Sweden, allowing for cost-efficient, local sourcing of wood. The feasibility study is expected to be completed by the end of 2021 and if the project is approved, the production could start earliest at the end of 2023.



### Renewable, plastic-free products for eco-friendly lifestyles

In 2020, we introduced several new renewable products for packaging. PureFiber™ by Stora Enso enables plastic- and PFAS-free food service packaging made from formed fiber. Investments in more formed fiber capacity in Sweden and China are ongoing. Performa Light by Stora Enso is a new plastic-free, lightweight board with low climate impact for food and cosmetics packaging.



### Growth in mass timber construction for eco-living

Stora Enso is enhancing its position as the market leader for cross laminated timber (CLT) by building a new production line at its Ždírec sawmill in the Czech Republic. As a sustainable renewable material, CLT shows significant growth potential in construction, as it makes it possible to build higher and lighter yet stronger multi-storey buildings. Production on the new line is scheduled to begin in the third quarter of 2022.



### Developments underway for bio-based protective packaging materials

Stora Enso is building a pilot facility for producing lightweight, fiber-based foam material that replaces oil-based polymer foams. Cellulose foam can be used as protective packaging for fragile products such as consumer electronics.



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### Accelerating circularity along the value chain

- **Increasing the recycling of used beverage cartons in Central and Eastern Europe:** Together with Tetra Pak, Stora Enso is exploring the possibility of building a new recycling line for used beverage cartons (UBC) at its Ostroleka Mill in Poland.
- **Developing barriers designed for circularity:** Stora Enso is investing in dispersion barrier technology at its Forshaga site in Sweden. The investment supports the development of paperboard with barrier properties that are easier to handle in a recycling process, have a smaller carbon footprint and can be composted in industrial facilities.
- **Extending the lifecycle of paper cups:** During 2020 Stora Enso continued to explore the recycling potential of paperboard cups for magazine paper production at Langerbrugge Mill in Belgium. The paperboard is made from renewable, high-quality fibers that can be recycled several times.
- **Working for positive change in the circular economy:** Stora Enso is part of the 4evergreen alliance – a European circular economy platform focusing on fiber-based packaging. The aim is to drive the recycling of fiber-based packaging and collaboration in circular design.
- **Turning wastewater into renewable energy:** Stora Enso and energy company Gasum have built a biogas plant at Stora Enso's Nymölla paper mill in Sweden. The plant, built and operated by Gasum, turns the mill's wastewater into Liquefied Biogas (LBG).



### A more efficient way of handling dry lignin and development of carbon fiber

Stora Enso is building a granulation and packing plant for lignin, allowing easier packing and handling of lignin compared to powder and wet form. Lignin is one of the key innovation areas for Stora Enso for delivering growth on new applications, such as energy storage, binders, and carbon fiber. Stora Enso and Cordenka, the world's largest producer of industrial rayon, are developing bio-based carbon fiber for industrial applications, such as wind energy rotor blades.



### Science-based evidence for positive climate impact

Stora Enso is collaborating with the Swedish University of Agricultural Sciences (SLU) to develop more accurate climate impact research for forest product companies. In 2020, SLU published a new report, providing evidence of Stora Enso's positive climate impact. The report confirms that when our products are used to replace fossil-based and other non-renewable materials, it is possible to save 18 million tonnes of fossil CO<sub>2</sub>e annually from entering the atmosphere.



### A new valuation method for forest assets

Stora Enso started using a valuation method based on market transaction data for its forest assets in the Nordics. The methodology is based on market transactions in the regions where Stora Enso's forests are located, on the standing stock and price data of the traded forest, and own forest regional standing stock inventory. This method provides a more transparent and less subjective basis for valuation. The total value of the Group's forest assets increased to EUR 7.3 billion at the end of 2020.



### Meeting the growing need for sustainable textile fibers

TreeToTextile is a joint venture between H&M group, Inter IKEA group, Stora Enso, and inventor Lars Stigsson. TreetoTextile's goal is to develop and industrialise an innovative man-made cellulosic fiber technology that will provide textile fibers with good sustainability performance at a low cost.



The pandemic has changed our buying behaviour and e-commerce is growing in specific areas, such as food. More deliveries mean more packaging, and consumers are increasingly aware of the environmental impacts of materials – they want eco-friendly and circular solutions.

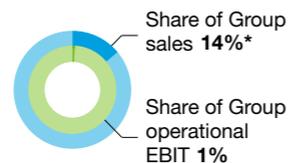
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# Our divisions have specific focus areas and products that cater to a broad range of customers.

## Biomaterials

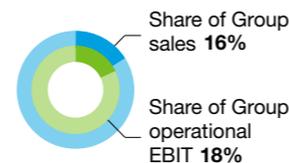
The Biomaterials division meets the growing demand for the replacement of products made from fossil-based and hazardous materials with bio-based solutions. The division's offering includes a wide variety of pulp grades.



\* of which internal sales 14%  
Sales include inter-segment transactions.

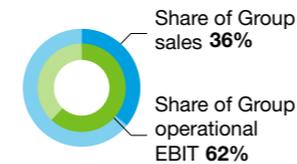
## Wood Products

The Wood Products division is a leading provider of wood-based solutions for construction, the window and door industry, pellets and for the packaging and decoration industries.



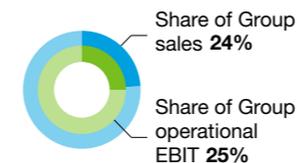
## Packaging Materials

The Packaging Materials division is a global leader in high-quality renewable packaging materials based on both virgin and recycled fiber.



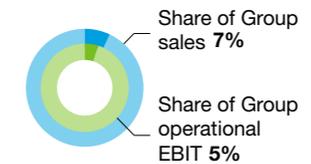
## Forest

The Forest division sources all wood raw material to Stora Enso Mills in Finland, Sweden, Russia and the Baltic countries. It also manages Stora Enso's Swedish forest assets and the 41% share of Tomator, the majority of whose forest assets located in Finland.



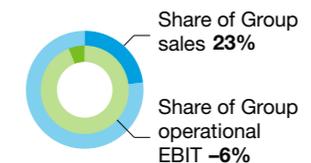
## Packaging Solutions

The Packaging Solutions division develops and sells premium fiber-based packaging products and services.



## Paper

The Paper division offers a wide product portfolio of paper products for print and office use based on both recycled paper and fresh fiber.

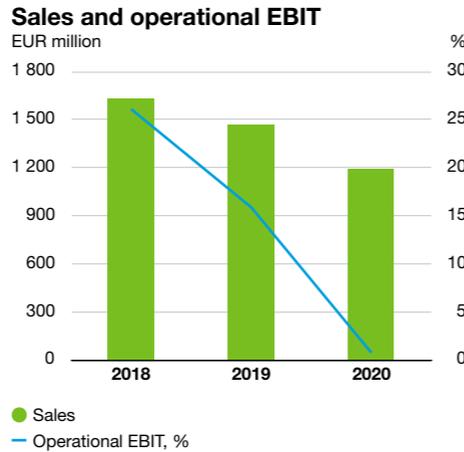


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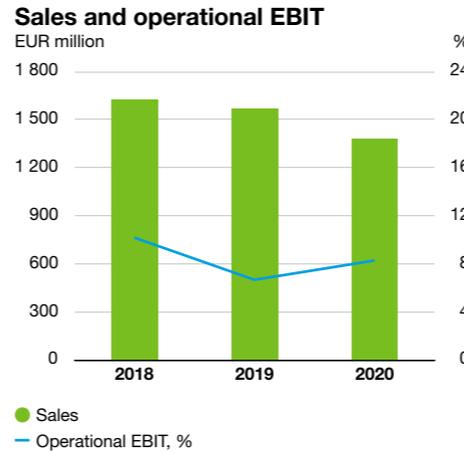
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# Stora Enso has remained resilient in the challenging times, thanks to our diversified business portfolio and relatively strong balance sheet.

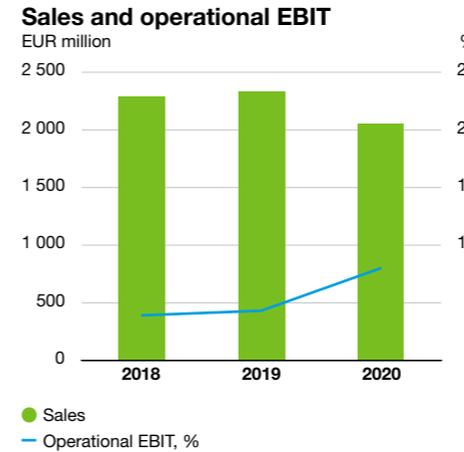
## Biomaterials



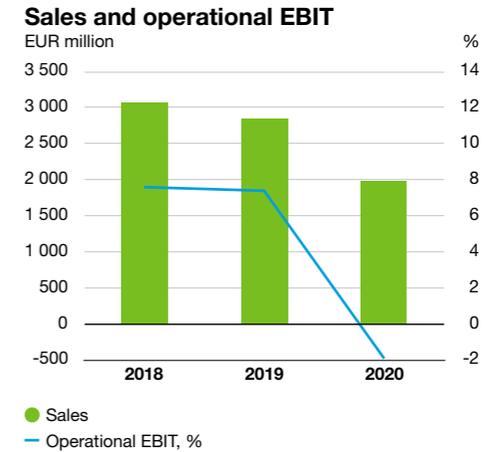
## Wood Products



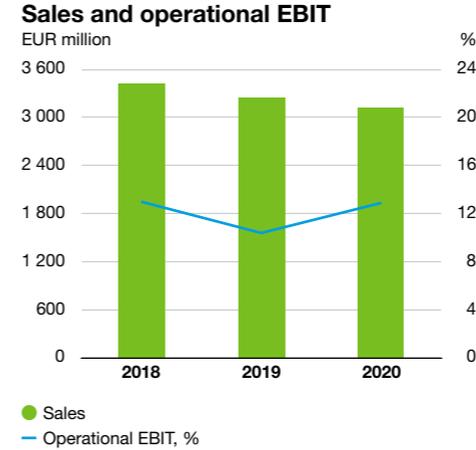
## Forest



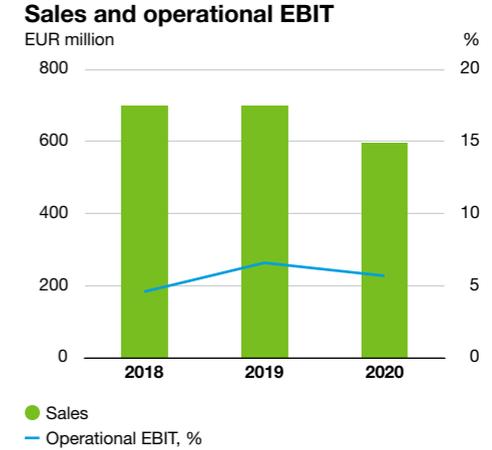
## Paper



## Packaging Materials



## Packaging Solutions





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# Significant potential for profitable growth

Little did we know, entering 2020, what an extraordinary year it would be for the world. It was shaped by an uncertain political and economic landscape, but above all by the pandemic. In these challenging times for societies, companies, and individuals, Stora Enso has remained resilient. Our business is built on a renewable raw material, serving global markets with products that help consumers make eco-friendly choices.

### Our changing world

The battle against climate change cannot be put aside – on the contrary, it is more important than ever that we accelerate the shift towards a circular bioeconomy. As a society, we need to end our dependency on fossil-based materials in favour of products based on renewable materials. Stora Enso's offering plays an important role in this. Sustainably managed forests grow back and our products are low carbon, helping to address some of the world's climate challenges.

### Making choices for growth and value

In 2020 we renewed our strategy, entering a new phase in our transformation journey and shaping our business for accelerated growth and value. We have chosen to focus our growth initiatives on Packaging, Building Solutions, and Biomaterials Innovations. These are the areas where we have leading market positions and are in the frontline of customer driven innovation. And we can build on strong and competitive assets to drive accelerated profitable growth.

In Packaging, we see increasing demand for sustainable, plastic-free, and circular products and continue to drive innovation that goes beyond consumer needs. We are a global leader in wooden Building Solutions, which improve construction efficiency and can replace concrete and steel, significantly reducing the carbon footprint. New biomaterials, such as biochemicals based on lignin for binders, carbon fibers, and energy storage, provide a highly attractive innovation platform, with the potential to become a business of its own one day. Learn more about this in the [Transformation](#) section of this report.

### Creating value in forest, pulp and paper

Although we have specific growth areas, our ability to create value has its foundation in the forest. We are one of the largest private forest owners in the world today. The forest is a valuable, growing asset that ensures a long-term fiber supply for our products. In addition, pulp is the base for our production of packaging materials, as well as for innovation within biomaterials. The traditional wood products business contributes to value-added solutions within Building Solutions.

In Paper, we have continuously adapted to decreasing structural demand while generating strong cash flow and providing high service levels for our customers. We aim to ensure our paper business has a high degree of operational independence so that it can be more agile in adapting costs and operational processes to the changing market environment.

### Innovation through collaboration

In line with the updated strategy focus, we will concentrate our innovation efforts and resources on areas with strong business opportunities such as new sustainable packaging materials, sustainable barriers, and our biochemical platform. Speed to market is essential and we will continue to push this through collaboration and an open innovation approach. In our key initiatives, we are moving into the piloting and scale-up phase. We work across the value chain with customers, partners, suppliers, research and academic institutions, and start-ups to drive open innovation and find new solutions to some of the world's sustainability challenges. Examples



**Our customers are asking us to help them reduce their carbon footprint and innovate to substitute fossil-based materials.**

from 2020 include a strategic partnership with the Swedish University of Agricultural Sciences (SLU) to develop new knowledge within sustainable forestry. We have also entered several materials innovation driven partnerships, such as our collaboration with Cordenka – the world's largest producer of industrial rayon – through which we are jointly developing bio-based carbon fiber. Or the Tree-to-Textile project with H&M group, Inter IKEA group, and inventor



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Lars Stigsson, in which we are developing and industrialising an innovative, man-made cellulosic fiber technology that will provide textile fibers with good sustainability performance at low cost. We continue to explore new start-up related business ventures through the Combient Foundry Programme, which is the Nordic region's leading cross-industry collaboration network. In 2020, we were once again recognised as the most startup-friendly company in Finland. Through our Accelerator programme, launched in 2017, we have screened over 1 200 startups in nearly 40 countries.

Our investments support our strategic focus and innovation agenda. The major projects for accelerated growth are presented in the [Highlights of 2020](#) section of this report.

We want to support industries, producers and retailers in meeting the growing demand for eco-friendly and circular solutions – and developing a plastic-free supply chain is part of this. Yet this shift will not happen in isolation. Some oil-based plastics and fossil materials will be harder to replace. This change will require new levels of cooperation throughout value chains and different combinations of solutions.

### Investing for accelerated growth

Our investments are intended to support our strategic focus and innovation agenda. Our transformation project at Oulu Mill in Finland and conversion to kraftliner production was finalised. We are ramping-up the production of

new-generation formed fiber products. We have also announced investments in a new production line for cross laminated timber (CLT), a granulation and packing plant for lignin, and a feasibility study on significantly enhancing and expanding pulp and board production.

### Business during the pandemic

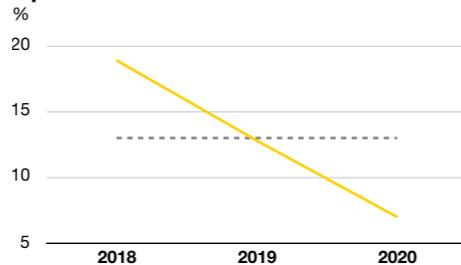
Like all businesses, we have taken numerous measures in the face of the Covid-19 pandemic. Our key priorities through the year have been to protect our people and business and to support our customers. Very early on, we took action related to mitigating the spread of the virus and its impacts, including a global travel ban, social distancing and appointed work streams to maintain the business momentum. Our units follow strict contingency plans, and significant effort has gone into managing our supply chain to serve our customers in the best possible way. We have built a strong liquidity position and continue active working capital management and cost savings with, for example, our profit protection programme. A strong cash flow gives us flexibility and therefore the ability to be ready when the markets eventually turn.

The market effects of Covid-19 have posed challenges for our paper and pulp businesses. However, with other parts of our diverse portfolio continuing to perform well during the pandemic, the overall impact has been limited. Moving into 2021, new vaccines will gradually be rolled out. In the meantime, we are prepared to

**100% plastic free is not always feasible, but the majority of fossil-based materials in packaging could be reduced with existing materials and technologies.**

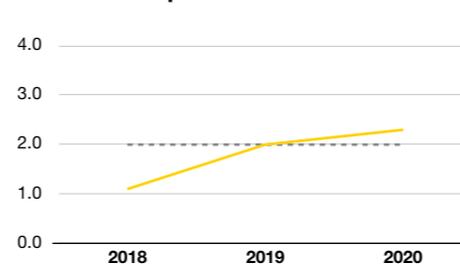


Operational ROCE excl. Forest



● Operational ROCE excl. Forest, %  
 — Target >13%

Net debt to operational EBITDA



● Net debt to operational EBITDA  
 — Target <2.0

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Dividend proposal per share  
**EUR 0.30**

Earning per share  
excl. fair valuation  
**EUR 0.45**

We are committed to the UN Global Compact's ten principles and the UN's Guiding Principles on Business and Human Rights.

manage uncertainty and volatility in the business environment. Our focus is on ensuring that our colleagues and partners are safe, and on serving our customers by keeping our operations running, mitigating supply chain challenges and introducing new products.

### True to sustainability

Sustainability is at the core of everything we do. It is integral to our relevance as a business, our role as a responsible member of society, and our ability to contribute to a greener world. Our emphasis is on social, environmental, and economic responsibility in our operations and the value chain. We have a strong commitment to keep our people and contractors safe. Our sustainably managed forests are an important part of climate change mitigation. With a focus on biodiversity, land-use, climate benefit and resilient local communities, our aim is to be the leader. We have set ambitious science-based targets for reducing greenhouse gas emissions. In 2020, our CO<sub>2</sub>e emissions per saleable tonne of board, pulp, and paper were 26% lower than the 2010 benchmark level. Every year, Stora Enso is estimated to have a positive climate impact equivalent to a reduction of 11.5 million tonnes of CO<sub>2</sub>e. This equates to the CO<sub>2</sub> emissions of some 5 million midsize cars driving 20 000 km.

### New targets reflecting the focus of our strategy

We have also adjusted our long-term financial targets and our goal is to grow profitably by more than 5% annually, excluding our paper business. The majority of our future growth will come from the high-margin packaging business, with

operational EBIT margins potentially exceeding 20% in growth areas. In Building Solutions, we aim to triple our sales with margins close to 20%. Within Biomaterials innovations, we aim for margins exceeding 35% in new markets for Stora Enso.

### Our people make it happen

Stora Enso is a large company with operations all over the world and our people are our greatest asset. We emphasise an inclusive culture, we have strong values and a sense of purpose, and as always, safety comes first. I am proud to work alongside so many talented colleagues. We are united in our aim to meet the demand for eco-friendly and circular solutions, further develop our product portfolio, and contribute to making the world a better place.

As I see it, the winners will be companies that have businesses which are sustainable in the long term from an environmental, social, and financial perspective; that stay close to their customers and innovate based on consumers' future needs; that can manage volatility; and that are agile in adapting to this changed reality. This is Stora Enso's competitive edge.

To our customers, suppliers, investors and other stakeholders, I am delighted that you join us on this journey.

The renewable future grows in the forest.

**Annica Bresky**  
President and CEO

### Reaching key financial targets

EUR million	2020	2019	2018	Target	Performance against target
Annual dividend	0.30	0.30	0.50	See below <sup>1</sup>	●
Growth (excl. Paper)	-8.7%	-3.0%	5.9%	>5% per annum	●
Net debt to operational EBITDA	2.3	2.0	1.1	<2.0X	●
Net debt to equity	33%	43%	31%	<60%	●
Operational ROCE excl. Forest	7.0%	12.8%	18.9%	>13%	●

<sup>1</sup> To distribute 50% of EPS excluding fair valuation over the cycle.

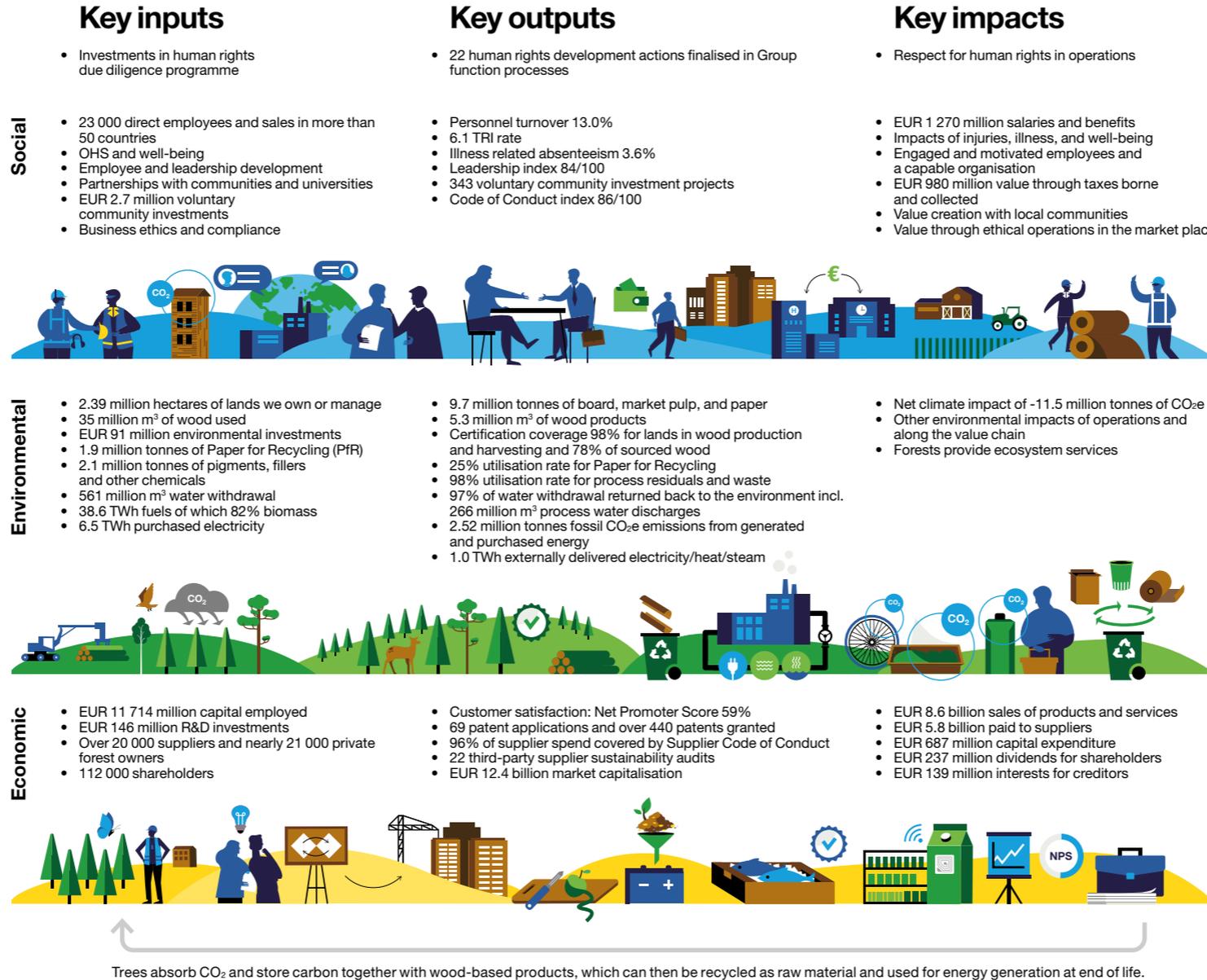
● Achieved  
● Not achieved

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# How we create value as a renewable materials company

Our solutions provide low-carbon alternatives to products based on finite resources.



**Our fiber-based materials are renewable and recyclable.**





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# Accelerating the eco-evolution of materials

Out of the global megatrends impacting societies, markets and businesses, climate change is our greatest challenge. Consumers, legislators, companies and financial institutions are focusing more on raw materials, CO<sub>2</sub> emissions, circularity, and waste reduction as well as on land-use and forestation. Moreover, governments around the world are increasingly regulating the use of fossil-based materials, such as plastics.

Through collaboration with its customers and partners, Stora Enso provides solutions that solve sustainability challenges facing businesses and industries. For example, food and beverage companies and retailers, both physical and online, are looking for ways to replace plastics in their packaging and become more circular. The construction industry is facing a major challenge to reduce carbon emissions and waste. The energy and transport industries are looking for strong bio-based alternatives for carbon fiber.

We meet our customers' challenges with our renewable, recyclable, plastic-free materials, supported by efficient, sustainable operations and supply chains.

### Our purpose:

**Do good for people and the planet.  
Replace fossil-based materials with renewable solutions.**

### Our values:

**Lead.  
Do What's Right.**



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# Shaping our business for higher growth and value

As the renewable materials company, our promise is that everything that can be made from fossil-based materials today can be made from a tree tomorrow. To accelerate this development, we are shaping our business to build on our leading positions and growth opportunities in packaging, building solutions and biomaterials innovations. Our forest, traditional wood products and market pulp are the foundation for value creation in our company.



- 1 We are a leader in eco-friendly, circular packaging
- 2 We drive the sustainable construction market through CO<sub>2</sub> efficient building solutions
- 3 We see innovation within biomaterials as a highly attractive platform for growth
- 4 Forest, traditional wood products, and market pulp are our foundation
- 5 Paper is a strong cash generator

Packaging will represent a majority of Stora Enso's growth, given the rising demand for sustainable packaging. We have strong market positions backed by cost-efficient integrated assets and have identified several attractive growth opportunities. We want to increase collaboration with brand owners, retailers and converting partners to drive the packaging innovation agenda and accelerate plastic substitution. Furthermore, we are speeding up the commercialisation of formed fiber, biofoam, biobarriers and films to replace fossil-based solutions.

We have attractive growth opportunities in Building Solutions, where we offer wooden alternatives to construction materials with a large carbon footprint, such as concrete. Supported by our strong sawmill presence in Europe, we can capture a larger share of the wood

construction value chain through value-added solutions. In line with this, we are transforming our wood products offering from a classic sawmill commodity business to integrated mills with an end-to-end focus. This entails new business models and services, such as digitalisation tools and the prefabrication of wooden buildings.

Our agenda in Biomaterials Innovation will mainly focus on bringing new innovative and sustainable materials based on lignin to the market. Here we target strong growth in new applications and end uses with our proprietary technologies and unique value propositions. Through best-in-class knowledge and strategic collaborations and partnerships, we can accelerate breakthrough innovations in for example lignin-based carbon for energy storage, bio-binders, and carbon fibers.



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# Rooted in the forest, traditional wood products, and pulp

Our forests ensure a long-term fiber supply for our businesses, now and in the future. We strive to be the leader in sustainable forest management with a focus on biodiversity, land use, climate benefits and resilient local communities. We will also work to increase forest growth and sustainable harvesting levels through innovations in precision forestry and digitalisation, as well as biotechnologies for tree breeding.

Our traditional wood products business – sawmilling – is the base for value-added products within Building Solutions and supports our pulp mills by supplying fiber.

Integrated and cost-efficient pulp production underpins our board and paper manufacturing operations and is the basis for our cost competitiveness and future growth. Our two market eucalyptus pulp mills in Latin America (joint operations) are highly competitive and we continuously work to further improve their cost positions. In our market pulp mills in Sweden and Finland, we focus on developing higher value-added specialty pulp products, leveraging internal capabilities and strong customer relationships.

Our Paper business is a strong cash generator with assets and products that can remain competitive in a declining market. We will continue to focus on cost reductions and capacity management. Moreover, the division will be given higher operational independence so that the business can better adapt to the challenging market conditions.



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# Innovations driving change towards a greener future



Our innovation agenda is driven by finding new renewable solutions to replace fossil-based materials. In this way, we help our customers offer eco-friendly and circular products to their customers and consumers. Innovation at Stora Enso focuses on new sustainable packaging materials, bio-based barrier solutions, and lignin-based breakthrough materials, such as bio-binders and bio-based carbon fiber for energy storage. Digitalisation is a key enabler in supporting capabilities in the industrial transformation and in developing new business models. Cooperation across the value chain with customers, suppliers, industry partners, startups, and academia is needed to develop the desired sustainable solutions.

The latest research and customer insights are important inputs in defining the winning path forward. This encompasses new properties of or uses for wood fiber-based materials, new business models or service concepts, as well as more effective energy and resources usage, in our own operations and throughout the whole value chain. In order to drive scientific development in prioritised areas we engage with leading international researchers and universities. We have strategic partnerships with four universities in the Nordics: Aalto University, Chalmers University of Technology, The Royal Institute of Technology and The Swedish University of Agricultural Sciences. These partnerships are also important in terms of ensuring access to well-educated engineers, foresters and researchers, responding to both short and long-term research needs. Stora Enso also has cooperation with other universities. We aim to gradually intensify the work with leading research and science groups globally to address challenges we want to solve together.

During 2020 we had

**508**  
ideas

**19**  
campaigns

**69**  
patents filed

Our focus on innovation has resulted in a number of recent launches, partnerships, and pilots, including new offerings in formed fiber, lignin-based binders, carbon fiber, bio-based carbon materials, bio-based foam for packaging applications, and intelligent packaging.

In the search for future business opportunities, we have expanded our collaboration with Combient Foundry, a venture client alliance of 30 industry-leading Nordic companies. Through

this partnership, we are reaching out to a wider selection of startups with a materials focus. We are also working with other innovative companies, such as the world-leading rayon producer Cordenka to develop bio-based carbon fiber, HS-Manufacturing to develop plastic- and fluorochemical-free barriers for food packaging, and the TreeToTextile, a joint venture with H&M group, Inter IKEA group, and inventor Lars Stigsson, to industrialise wood-based textiles.

## Increasing focus on our innovation agenda

We aim to increase the focus of our innovation efforts in the areas of sustainable barriers, new sustainable packaging materials, and our biochemical platform in lignin. Speed to market is essential and we will drive this through cooperation with other parties and an "open innovation" approach.

### Three focus areas for innovation, research, and development at Stora Enso:

Formed fiber



New applications for fiber-based packaging to replace fossil-based materials

Biofoam



New technologies for barriers

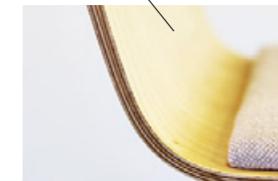


Bio-based barrier solutions for packaging applications

Carbon for energy storage



Bio-binders



Carbon fiber



Biomaterials innovation



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## Cases



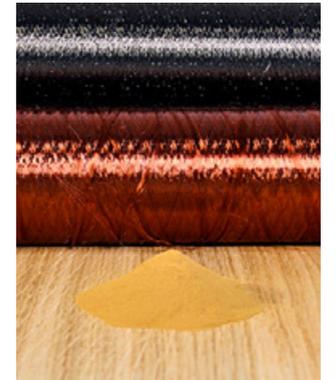
### Bio-based foam for protective packaging and cushioning

Stora Enso will build a pilot facility for producing a lightweight, fiber-based foam material that replaces oil-based polymer foams. Cellulose foam can be used as protective packaging and for cushioning of fragile products such as consumer electronics. The material offers a renewable, recyclable, and biodegradable alternative to traditional oil-based inner packaging, such as plastic foam or polystyrene.



### Eco-friendly barriers for food service applications

In 2020, Stora Enso expanded its range of renewable packaging materials by introducing new dispersion barrier materials for paper cups and food packaging. Barriers are needed for protection against moisture, oxygen, or fat, for example. The new barrier solution responds to market demands for eco-friendly, renewable and recyclable packaging materials to replace plastics in food service applications. The new dispersion barriers Aqua™ and Aqua+™ by Stora Enso are fluorochemical-free and used to produce paperboard for cups and food service packaging without the traditional plastic layer.



### Carbon fiber for wind energy rotor blades

Today, 20% of the global carbon fiber supply is used by the wind energy industry. In collaboration with Cordenka we are developing renewable and fossil-free carbon fiber for industrial applications requiring low weight and high mechanical performance, such as wind energy rotor blades.



### Bio-based carbon materials for energy storage

Stora Enso is developing bio-based carbon materials by processing lignin into a carbon intermediate for electrode materials. By converting lignin into so-called hard carbon anode materials for lithium-ion batteries, we can offer a product that replaces fossil-based anodes, mainly synthetic graphite, currently used in batteries.



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# Positive climate impacts through substituting fossil-based materials

With our sustainably managed forests and renewable solutions, we contribute to climate change. Positive climate benefits are achieved through forest sequestration with trees absorbing CO<sub>2</sub> from the atmosphere, as well as through the replacement of fossil-based or other finite materials with renewable ones. Good management of forests means healthy forests and increased productivity. It also means protecting biodiversity and ensuring that forests are always regenerated. Better growth in the forest enables us to substitute more fossil-based products with renewable solutions.

The product substitution effect describes how much greenhouse gas emissions would be avoided if a wood-based product, serving the same function, was used instead of a fossil-based product. Our renewable products can help to reduce emissions otherwise generated in the production or consumption of fossil-based products. When the new materials come from renewable sources, as wood does, no additional fossil CO<sub>2</sub> will be released into the atmosphere. Carbon remains in the fibers when they are made into products, even through recycling. Non-renewable raw materials cannot be replenished during our lifetime – if ever. That is why we at Stora Enso believe the future grows in the forest.

### Case

#### Stora Enso's climate impact



Our forests remove carbon  
**-1.5**  
million tonnes of CO<sub>2</sub>



Our products store carbon  
**-2.6**  
million tonnes of CO<sub>2</sub>



Our value chain emissions  
**+10.5**  
million tonnes of CO<sub>2</sub>



Our products substitute fossil-based products, saving  
**-17.9**  
million tonnes of CO<sub>2</sub>

Climate impact  
**= -11.5**  
million tonnes of CO<sub>2</sub>

Read more › Sustainability 2020



## Assessing the life cycle of our renewable products

Stora Enso regularly carries out Life Cycle Assessments (LCAs) to understand and develop product environmental footprints, including carbon footprints. The LCAs show great potential for renewable products in substituting fossil-based alternatives to cut carbon emissions. The LCAs are conducted by our own experts, our customers, or brand owners, often in collaboration with academia, expert organisations, or industry associations.

### Our products help combat climate change



#### Formed fiber bowl

According to the LCA conducted by Stora Enso in 2020, formed fiber is the most low-carbon material choice on the market. The PureFiber™ product line contains no plastic or per- and polyfluoroalkyl substances (PFAS) and enables an approximately 75% lower CO<sub>2</sub> footprint compared to alternative packaging materials, such as plastic or bagasse.



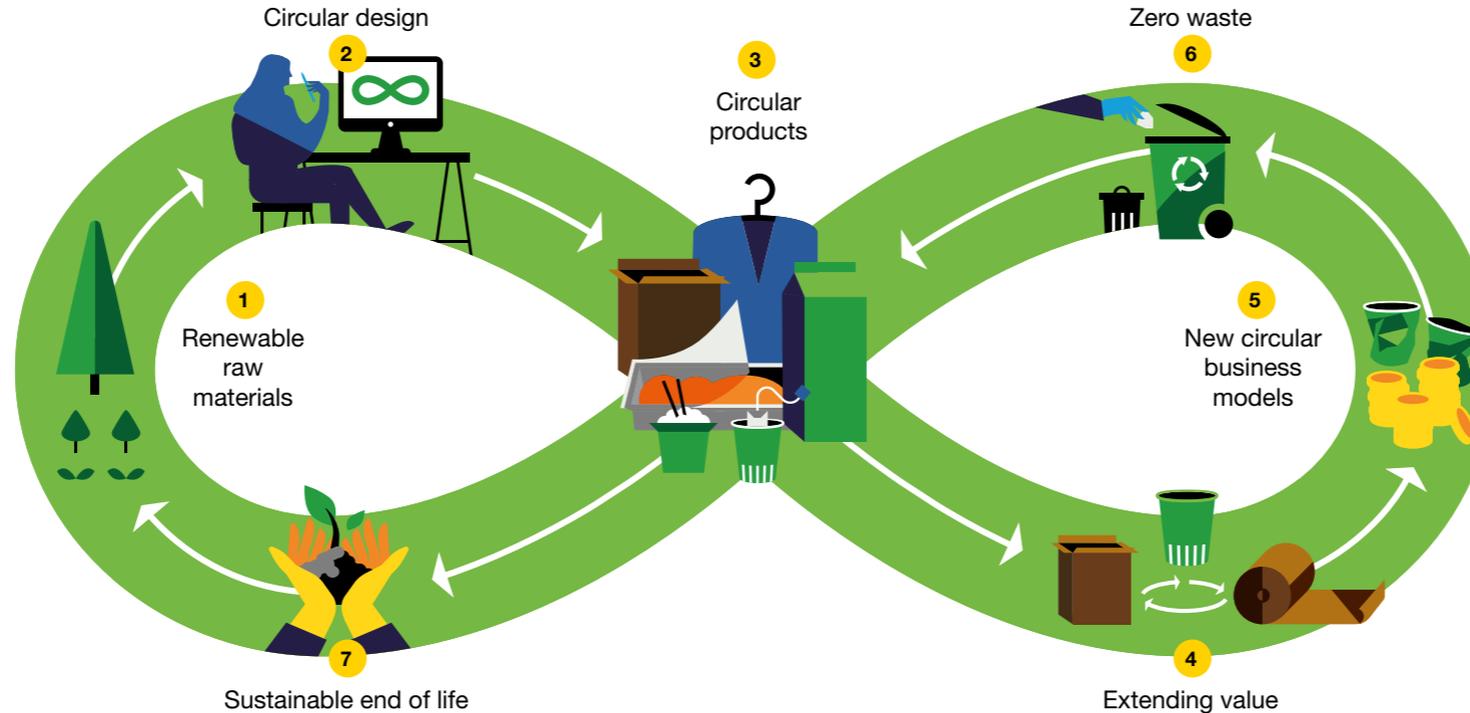
#### Wooden buildings

The wood used in Wood City office building, the largest wooden office building in Finland, removed 1 500 tonnes of CO<sub>2</sub> from the atmosphere. This equals to the annual emissions of 660 passenger cars. It takes 5 minutes for an equal amount of wood to grow in a Finnish forest on a summer day.



# Towards a circular bioeconomy

The world needs materials that are both renewable and recyclable – a circular bioeconomy – to combat climate change and to limit the use of finite resources with a large carbon footprint. As a leader in the bioeconomy, Stora Enso’s focus is to create value through projects and partnerships that integrate the circular economy into design and innovation.



**1 Renewable raw materials**  
Trees are renewable. This means that in sustainably managed forests, they can grow forever. For Stora Enso, renewability is at the core of what we do – we need healthy forests to do business. Growing trees absorb CO<sub>2</sub> from the atmosphere, and together with wood-based products act as carbon storage.

**2 Circular design**  
Circular design refers to designing for all stages of the product lifecycle, instead of designing just the product itself. It considers the materials

used, the manufacturing process, the distribution and the potential for reuse, refurbishment, remanufacturing or recycling. Our aim is to maintain the value of products and materials for as long as possible through product design, innovation and recycling. Our core circular design principles are leading us on our way towards a circular future.

**3 Circular products**  
In the circular bioeconomy, products are bio-based. They are also shared, reused, remanufactured, and finally recycled. Creating new

products and business models is all about collaboration. We are forming partnerships to build circular value chains for the future.

**4 Extending value**  
Stora Enso is one of the biggest buyers and users of recycled board and paper in Europe. We are also exploring options to recycle products into something very different than its original purpose. Utilising side streams and waste can also bring added value. Our revenues derived from residuals amounted to EUR 105 million in 2020.

**5 New circular business models**  
We are collaborating with customers and partners to develop new circular solutions and business models to replace fossil-based plastics and cut down on waste along the supply chain. Solutions could include leasing and take-back programmes. Stora Enso is one of the lead companies behind the 4evergreen alliance, a European circular economy platform. The aim is to drive the recycling of fiber-based packaging and collaboration in circular design and materials.

**6 Zero waste**  
As the renewable materials company, we work to minimise waste and resource use overall. In our own operations, we focus on optimising our use of resources and creating value out of by-products through innovation and collaboration.

**7 Sustainable end of life**  
When a material or product has reached the end of its life, we promote recycling and energy recovery to create further value. At the end of the life cycle, many of our products are biodegradable or can be burned for energy.

**A circular economy requires collaboration across the value chain to drive change at all stages, from product design and recyclability testing to collection and recycling systems.**

**Opportunities in circular construction**  
Designing for products to be updated during use extends their lives and saves users’ resources. Modularity, on the other hand, allows for products to be re-used over time. For example, construction is becoming more circular as modular building solutions enable multiple uses for building elements during their lifecycle. Stora Enso Building Concepts provides tools and guidance for architects, engineers and developers to design modifiable office buildings from wood.  
There are a lot of future opportunities in recycled wood: in Europe, about 25 million tonnes of wood is discarded annually as a result of construction and demolition, and by private households. This provides interesting opportunities for Stora Enso to source material.

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# Forest is our foundation for value creation

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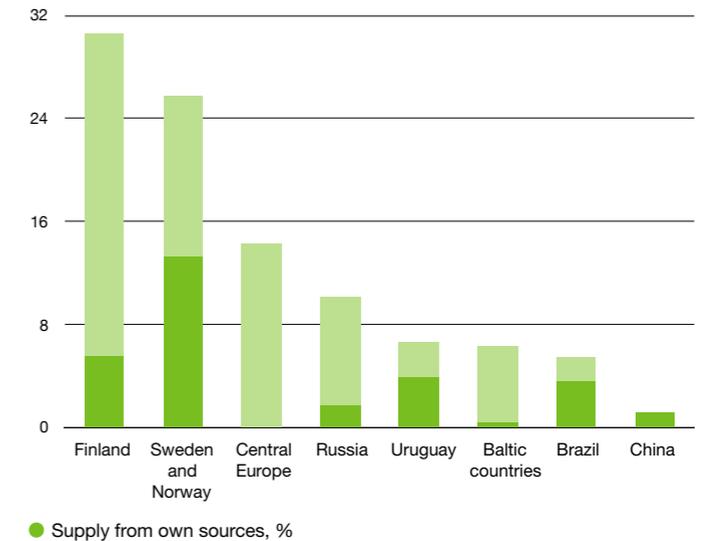
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Sustainable forest and plantation management secures long-term availability of wood – our most important renewable raw material. We ensure that forests grow to a greater extent than they are harvested, and that biodiversity is promoted as part of everyday forest management practices. The climate benefit and economic values from growing forests are gained while promoting biodiversity and other sustainability aspects. Our customers can therefore be assured that our products originate from sustainably managed forests, as 98% of the lands we own or manage are covered by forest certification. Stora Enso owns forest land in Sweden and also has biological assets in Finland, Brazil, Uruguay, and China through subsidiaries and joint operations, and indirectly through equity-accounted investments.

In 2020, Stora Enso changed its forest assets valuation method. The forest assets in Sweden are valued by using a market approach method based on the forest market transactions in the areas where Stora Enso's forests are located. Today, Stora Enso is one of the largest private forest owners in the world with forest assets valued at more than EUR 7 billion (land and biological assets) in 2020, including the biological assets of more than EUR 6 billion in Sweden and Finland. Globally, Stora Enso owns or manages lands covering a total area of 2.34 million hectares. About 30% of the Group's wood raw material needs are covered from its own sources or long-term supply agreements.

Wood procurement by region, %



We control about 30% of our wood raw material consumption globally. In 2020, we harvested in own forests and sourced from long-term agreements 10 million m<sup>3</sup> in total. Our deliveries to our own mills was 35 million m<sup>3</sup> in total.



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## Stora Enso's productive forest land areas at end of 2020

Total forest asset value in balance sheet EUR 7.3 billion



**Montes del Plata, Uruguay**  
 Stora Enso's share  
**135 000 ha**  
 of forest land  
**Fair value:** EUR 418 million  
 (31 Dec 2020)

**Veracel, Brazil**  
 Stora Enso's share  
**112 000 ha**  
 of forest land  
**Fair value:** EUR 93 million  
 (31 Dec 2020)

**Swedish forests**  
**1 398 000 ha**  
 of forest land  
**Fair value:** EUR 5 603 million  
 (31 Dec 2020)

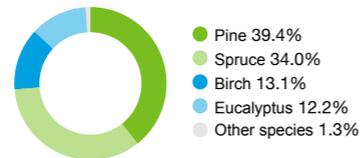
**Tornator**  
 Stora Enso's share  
**259 000 ha**  
 in Finland,  
**28 000 ha**  
 in Estonia, and  
**5 000 ha**  
 in Romania  
**Fair value:** EUR 825 million  
 (31 Dec 2020)

**Guangxi, Southern China (leased)**  
**81 000 ha**  
 of forest land  
**Fair value:** EUR 359 million  
 (31 Dec 2020)

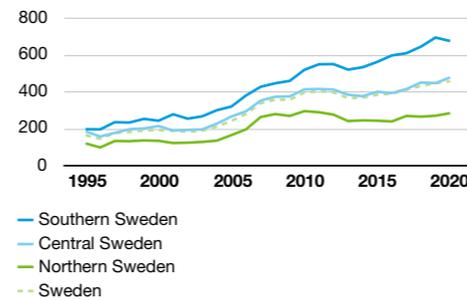
**In addition:**  
**Laos:** trial plantation, 3 890 ha (leased land)  
**Russia:** 369 000 ha (long-term harvesting rights)

Including owned land EUR 2 065 million and leased land EUR 221 million balance sheet value at the end of 2020.

### The distribution of species



### Market transaction based forest prices in Sweden



The importance of forests as a valuation driver has increased.

**Forest growth**  
**13.4**  
 million m<sup>3</sup> fo.\*

**Annual harvesting**  
**9.4**  
 million m<sup>3</sup> fo.\*

**Productive standing stock at the end of 2020**  
**195.1**  
 million m<sup>3</sup> fo.\*

\* Forest cubic metres





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# Focus on sustainable forest management

We established the Forest division in the beginning of 2020 to increase the transparency of our forest assets and operations. The Forest division includes wood supply operations in Finland, Sweden, Russia and the Baltics, Stora Enso's forest assets in Sweden, and a 41% share of Tornator, the majority of whose forest assets are located in Finland.

### Platform for innovations

Our forest professionals, forest assets and international network create a unique set-up for innovation and development. There are several opportunities to further improve our forest management. Examples include remote sensing technology, tree breeding, and genetic engineering.

### Precision forestry

Digitalisation, remote sensing technology, and artificial intelligence will enable us to take a step forward in the way we operate in forests and in the wood supply chain. In the future, improved forest data and a forest's digital twin enables more accurate forest planning and operations.

With a forest's digital twin, we can analyse, for example, the shape, height, and diameter of a single tree, the structure of a forest site, and the landscape view. We will be able to carry out forest work more precisely in the right place at the right time. Improved data will also support our ambition to achieve more influential sustainability actions. As we become more aware of the growth conditions of individual trees, we can help trees to adapt to the weather fluctuations caused by climate change.

### Future-fit forests

We breed the best trees for future forests and plantations while promoting biodiversity and other sustainability aspects. Tree breeding, in other words crossing two selected parent

trees to create a new generation with improved properties, is a very important way of improving the future growth of the forest. Each crossing cycle gives a yield improvement of 10–15%. Improvements focus on growth, quality and resilience parameters. We have ongoing long-term strategic tree breeding programmes for all our forest and plantation units.

In our own nurseries in Sweden, we produce superior seedlings for next-generation forests. We improve and speed up the breeding process through, for example, somatic embryogenesis, where we produce many spruce seedlings from one single seed of a selected spruce tree. We develop gene technologies through genetic engineering to improve and protect the yield of eucalyptus plantations, and of spruce and birch in the Nordics. Our genetic engineering activities are in the research phase.

We develop and deepen our forest management practices based on the knowledge we gain from tree breeding. This work is supported by our strategic collaboration with the Swedish University of Agriculture and Forestry, which started in 2020. The collaboration focuses on four integrated collaboration areas: biodiversity, growth- and yield-adapted forest management, remote sensing technology and life cycle analysis.

See also:

- › **Financial Report:** Note 12 Forest assets
- › **Sustainability Report:** Forests, plantations, and land use



The total amount of wood (including roundwood and wood chips) delivered to Stora Enso's mills was

# 35 million m<sup>3</sup>

sub<sup>1</sup> in 2020

Stora Enso regenerated forest by planting

# 62 million

seedlings in 2020

In 2020,

# 98%

of the land Stora Enso owns or manages was covered by forest certification schemes

In 2020 Stora Enso invested

# EUR 68 million

in future growth through silviculture and fertilisation

Share of fiber costs<sup>2</sup> of Group's total costs:

# 32%

<sup>1</sup> Solid under bark cubic meters

<sup>2</sup> Including purchased pulp, recycled paper and purchased containerboards





# Developing our people's skills to lead our transformation

Value and purpose-driven leadership is a key enabler for executing our strategy and the strongest driver for performance and a healthy company culture. Our values are "Lead" and "Do what's right", which we expect our leaders and all people to embrace and demonstrate through their everyday actions and behaviour.

We continuously invest in the development of our leaders through internal and external leadership programmes. Our programme "Lead Through People", targets all managers in the company. During 2020, we launched the "Stora Enso Manager" programme, our new global programme for new first-line managers. Stora Enso Manager is available with the same content and set-up globally and delivered in nine different local languages.

During 2020, we organised a series of digital webinars to support managers and address challenges especially related to remote leadership. Around 1 700 managers were invited to these online seminars. In addition, we also provided separate workshop materials related to health and wellbeing for all managers.

Our own flagship programme, the Accelerator, will be run again in early 2021 with the start-up companies and programme participants that were selected during autumn 2020. Since launching the Accelerator programme in 2017, Stora Enso has screened more than 1 200 start-ups from 39 countries and established a deeper relationship with more than 30 of these companies. Combining collaboration with start-up companies and executive training, the programme aims at further strengthening the capabilities required for our transformation in the areas of innovation, entrepreneurship and customer insight.

A global mentoring concept is in place to further build one company culture and use the learning and development opportunities that mentoring provides. Over 180 mentoring matches have been made since the launch of the concept and anyone in the company who wishes to have and/or to be a mentor can sign up.

To promote new talent and diverse perspectives, Stora Enso runs the GROW Global Trainee Programme. Within the programme, graduates are initiated into the global Stora Enso organisation during their first 16 months of employment. In 2019 we welcomed 24 new GROW trainees and they have continued their learning journey and development during 2020. Stora Enso also participates in the Female Leader Engineer programme.

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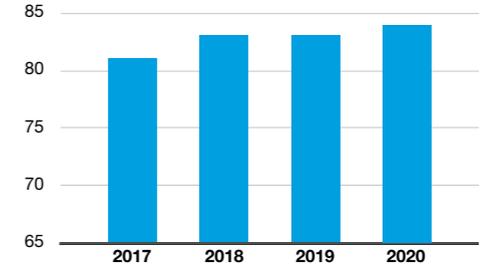
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**Valuable insights from our global employee survey**  
Stora Enso conducts an annual global survey (Your Voice) of all employees. In 2020, the survey was conducted for the ninth time and had a response rate of 83% (86%). The survey follows progress in areas that impact our ability to deliver on our strategic agenda, steering activities and priorities. It also supports managers and teams as they continuously improve their work methods. In 2020, there was a positive or neutral trend in all indices. In the leadership index, transformation index, health and wellbeing index, and employee net promoter score there was a positive improvement. Despite the exceptional circumstances this year, we have been able to maintain a good level of engagement and team efficiency among our employees.

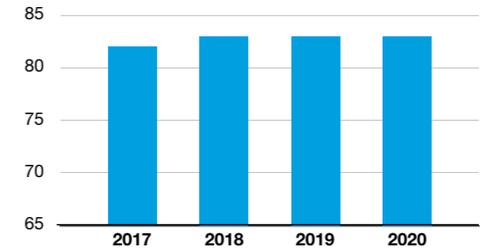
**Despite the exceptional circumstances this year, we have been able to maintain a good level of engagement and team efficiency among our employees.**

### Leadership



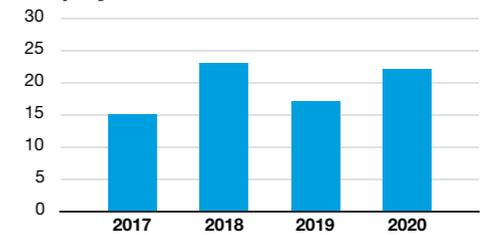
Leadership Index is measured annually in Stora Enso's Your Voice employee survey, and consists of 16 questions related to the respondent's view of the direct manager.

### Engagement



Employee Engagement Index is measured annually in Stora Enso's Your Voice employee survey, and consists of numerical answers to seven questions related to engagement indicators including, but not limited to motivation, pride and goal orientation.

### Employee Net Promoter Score



Employee Net Promoter Score is measured annually in Stora Enso's Your Voice employee survey, and consists of one question related to the likelihood of recommending Stora Enso as a workplace to a friend. A positive score indicates that there are more promoters than detractors, while a negative score indicates the opposite.



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# Creating value in the bioeconomy with our renewable products

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# Packaging Materials

The Packaging Materials division is a global leader in the circular economy with our premium renewable and recyclable packaging materials based on both virgin and recycled fiber. Addressing the needs of today's eco-conscious consumers, we help customers replace fossil-based materials with low-carbon, renewable and recyclable alternatives for their food and drink, pharmaceutical, or transport packaging. A wide selection of barrier coatings enables design optimisation for various demanding packaging end-uses.

### Business environment

Stora Enso is the global leader in liquid packaging and the biggest producer of food service board and carton board in premium end-use segments Europe. In the large containerboard market, we are a niche player with world-class assets, providing high-end products with both virgin and recycled fiber. The containerboard market is fragmented with many larger and smaller players. Our cost-efficient production in Finland, Sweden, Poland and China serves our customers globally.

### Markets

Our growth is faster than the global packaging market. The premium consumer board market is expanding

globally, by 9 Mt in 2014–2021. We are a market leader in LPB (Liquid Packaging Board), FSB (Food Service Board) and CUK (Coated Unbleached Kraft) in the world or Europe.

In consumer board products, Stora Enso has a strong base in Europe and competes with other Nordic board producers. Outside of Europe, the main competitors are established global and North American players. In containerboard products, the company competes with a large number of European or global large-scale producers. The main competition comes from other than fiber-based packaging materials such as plastic, metal, and glass.

### Strategic choices

- Significant growth opportunities for fossil free and circular packaging
- Attractive investment options for Packaging Materials growth



### Operational ROOC

# 13.9%

(Target >20%)

### Employees 5 557

Share of Group employees: 23%



### Sales



- Europe 62%
- Asia Pacific 26%
- Rest of the world 12%

### Our approach



"We are the expert packaging materials partner for customers and other stakeholders in the transition to a circular bioeconomy. We see significant opportunities to replace other packaging materials with our renewable, low carbon footprint, fiber-based solutions. We continue to collaborate with our customers to accelerate our innovation efforts. This,

in combination with our continuous efforts to improve the performance, material-efficiency and recyclability of our products, allows us to meet the increasing demand for eco-friendly packaging materials."

**Hannu Kasurinen**  
Executive Vice President,  
Packaging Materials Division



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# Packaging Solutions

The Packaging Solutions division develops and sells premium fiber-based packaging products and services. Our high-end eco-friendly packaging products are used by leading brands across multiple market sectors, including store retail, e-commerce and industrials. The portfolio includes corrugated and other converting, design services, automation solutions, and scalable innovations such as formed fiber and biocomposites.

### Business environment

Stora Enso holds a strong position in selected corrugated packaging markets. We have a leading position in the Nordics, are among the top three in the Baltics and Poland, and among the top ten in Russia. In China, we hold a leading position of consumer packaging solutions for premium products such as consumer electronics and cosmetics.

Making of corrugated packaging is typically a local business and the market is fragmented. We serve a broad range of end-use segments such as consumer electronics, home and garden, food and beverage across traditional retail, industry, and e-commerce.

### Markets

There are significant growth opportunities for corrugated packaging driven by growing e-commerce and the trend towards replacing plastics with renewable materials. Retail and e-commerce sales are forecasted to grow by 12–15% annually in our geographies.

The corrugated packaging market is fragmented, with many relatively small or medium competitors.

### Operational ROOC

# 14.1%

(Target >25%)

### Employees 5 094

Share of Group employees: 21%

### Sales



- Europe 78%
- Asia Pacific 13%
- Rest of the world 8%

### Strategic choices

- Drive packaging innovation closer to consumers
- Significant opportunities for new sustainable packaging



### Our approach



“Our customers want packaging to provide business value as well as to accelerate their shift to a plastic-free and sustainable supply chain. We support these needs through packaging solutions that help our customers increase sales, reduce waste, minimise transportation costs, and replace plastics. In 2020 we reshaped our business and accelerated our efforts in growth opportunities such as formed

fiber, biocomposites and our digital B2B platform Box Inc. This journey continues in 2021 and together with our customers and partners we strive to create even more value with solutions that are better for our planet.”

**David Ekberg**  
Executive Vice President,  
Packaging Solutions Division



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# Biomaterials

The Biomaterials division meets the growing demand for the replacement of products made from fossil-based and hazardous materials with bio-based solutions. We use all fractions of biomass, like lignin and sugars, to develop new solutions. We work to replace fossil-based materials with new applications such as carbon for energy storage, bio-based binders, and bio-based carbon fiber. The division's offering includes a wide variety of pulp grades to meet the demands of paper, board, tissue, textile and hygiene product producers as well as materials from side streams of our processes, such as tall oil and turpentine from biomass.

### Business environment

Stora Enso has the widest pulp grades portfolio in the market, and it is the leader in Europe in fluff pulp. The Biomaterials division has its own operations in Finland and Sweden, and joint operations in Brazil and Uruguay. 60% of the pulp produced is used within Stora Enso.

In our Nordic mills, our aim is to increase our share of specialised pulp, i.e. fluff and dissolving pulps, to address the changing paper pulp demand and to ensure the right product mix and customer base. This responds to

the increasing demand for sustainable fibers in the textile industry and for renewable hygiene products, for example.

### Markets

Pulp is a growth business with the total market growing by 2.4% or 1.5 Mt per year. The fastest growing segments are textiles (+3%) and hygiene (+3.6%).

Apart from the direct competition in our business, the Biomaterials division faces competition from biochemical companies and the chemical industry in terms of new potential markets for renewable solutions.

### Strategic choices

- A focus on strengthening competitiveness
- New biomaterials are a highly attractive innovation platform



### Operational ROOC

# 0.4%

(Target >15%)

### Employees 1 822



Share of Group employees: 7%

### Sales



- Europe 61%
- Asia Pacific 32%
- Rest of the world 8%

### Our approach



“Our Biomaterials offering focuses on research and innovation to develop new and viable business opportunities from fiber-based materials, especially in carbon for energy storage, bio-binders, and carbon fibers. As a strong and specialised chemical pulp producer, we focus on maximising the value

of eucalyptus pulp in Latin America, generating sustainable profits from our Nordic pulp operations, and delivering growth in new products.”

**Markus Mannström**  
Executive Vice President,  
Biomaterials Division

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# Wood Products

The Wood Products division is the largest sawn wood producer in Europe and a leading provider of sustainable wood-based solutions for the construction industry. Our growing Building Solutions business offers building concepts to support low-carbon construction and eco-friendly designs. We develop digital tools to simplify the designing of building projects with wood. We also offer applications for windows, doors and for packaging industries.

### Business environment

Stora Enso is the largest supplier of sawn goods in Europe and the fourth largest in the world with 17 production units in 10 European countries. This gives a strong base to produce wooden building materials such as CLT (cross-laminated timber) and LVL (laminated veneer lumber), targeting the growing wood construction markets. We are increasing the share of wooden solutions for new end uses like multi-storey houses, offices and schools.

As the supplier and customer base in the wood products industry are fragmented, we have strengthened the direct supply chains to merchants and end-users globally. In addition, our integrated distribution centres offer customers local service supported by digital tools such as our online ordering channel, MySupply.

Global megatrends shape our business environment: growing population size and urbanisation require more housing while the increasing eco-awareness raises demand for sustainable construction.

### Markets

Global sawn softwood is growing by 2–3% annually, and European new construction is expected to grow by 5–6% in 2021, recovering from Covid-19 related decreases during 2020.

Competition is fragmented and strong, ranging from sawmills to manufacturers of construction and interior products. In the construction market, wood competes mainly with concrete and steel. New end-uses for wooden buildings, especially multi-storey constructions, are increasing in market share.

### Strategic choices

- Attractive growth opportunities in Building Solutions
- Capturing a larger share of the value chain



### Operational ROOC

**19.1%**

(Target >20%)

### Employees 4 026



Share of Group employees: 16%

### Sales



- Europe 63%
- Asia Pacific 22%
- Middle East and North Africa 7%
- Rest of the world 7%

### Our approach



“As the market shift continues towards sustainable and renewable building materials, we strive to be the best choice for customers looking to reduce their construction carbon footprint. To drive profitable growth, our focus is on further industrialising the wood construction value chain via digitalisation and prefabrication of building elements such as walls, floors, columns, beams,

and stairs. We will also leverage our saw milling competences to develop customer-relevant innovations and digital solutions for the construction market, including architects, engineers and developers.”

**Lars Völkel**  
Executive Vice President,  
Wood Products Division



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# Forest

The Forest division creates value with sustainable forest management, competitive wood supply and innovation, which are the foundation for Stora Enso's renewable offerings. The division manages Stora Enso's forest assets in Sweden and the 41% share of Tornator, the majority of whose forest assets are located in Finland. The division is also responsible for wood sourcing for Stora Enso's Nordic, Baltic and Russian operations and B2B customers. Stora Enso is one of the biggest private forest owners in the world.

### Business environment

Stora Enso's wood supply operations in Finland, Sweden, the Baltics and Russia cover the entire management cycle in forests: from planning to harvesting, logistics and forest regeneration. Private forest owners are one of Forest division's main stakeholders, providing us with 32% of the wood delivered to customers. We build long-term relationships with private forest owners and provide them with comprehensive forest management services, such as forestry care, harvesting, procurement, and certifications.

Our own forest assets support competitive and stable wood sourcing and create value by increasing long-term yield, mitigating climate change impacts, and optimising land use. To capture the full value of our forest asset management, we have intensified our focus on R&D and digitalisation. We invest particularly in precision technologies for more accurate forest planning and in tree breeding for future-fit forests. We are also actively exploring new land-use possibilities, such as wind power and recreational forest use.

### Operational ROCE

# 3.9%

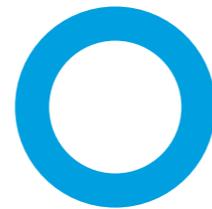
(Target >3.5%)

### Employees 1 520



Share of Group employees: 6%

### Sales



- Europe 100%
- Rest of the world

### Strategic choices

- The leader in sustainable forest management
- Innovation to increase forest growth



### Our approach



“As growing trees absorb carbon, we always strive to keep forests healthy while promoting biodiversity and other aspects of sustainable forestry. This ensures that Stora Enso's portfolio of fiber-based products stands on a truly renewable and traceable resource. To provide the best possible value to our customers and stakeholders, we focus increasingly on research and

development, as well as on the use of technology and digital solutions in forest management. In this way we ensure that our forests are fit for the future.”

**Jari Suominen**  
Executive Vice President,  
Forest Division



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# Paper

Stora Enso is the second largest paper producer in Europe, with an established customer base and a wide product portfolio for print and office use. Customers benefit from Stora Enso's broad selection of paper products made from recycled and virgin fiber, our technical expertise and our sustainability know-how as well as our mill and customer service centre network.

### Business environment

Paper markets have been in structural decline for several years, and in 2020, paper demand was further impacted by the Covid-19 pandemic. This is due to retail stores advertising less during lockdowns, and consumers buying fewer newspapers and magazines and printing less when working from home. The development has resulted in severe overcapacity in many paper grades as well as declining paper prices. One of the most challenged paper segments has been woodfree coated (WFC), which Stora Enso exited as planned at the end of 2020, with Oulu Mill being converted to produce kraftliner.

### Markets

During 2020, the Covid-19 pandemic accelerated structural demand decline and placed additional pressure on both prices and deliveries in all paper grades.

In the Paper division, we compete with other major European and global papermakers, not just in the quality and range of our products, but with the efficiency and sustainability of our operations and strong customer service. Our customer satisfaction, measured by Net Promoter Score, is very good and has increased by 20 percentage points in the past five years. More than 90% of our products are covered by one or more ecolabels, providing external recognition of superior environmental performance over the life cycle.

### Cash flow after investing activities to sales

# 1.6%

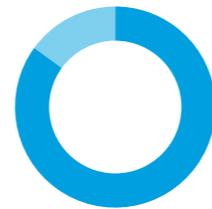
(Target >7%)

Employees 4 356



Share of Group employees: 18%

### Sales



- Europe 85%
- Rest of the world 15%

### Strategic choices

- Strong cash generation through cost reductions, active capacity management, and customer service
- Higher operational independence to adapt to challenging market conditions



### Our approach



"Paper will continue to play a role in media, advertising, education, retail and office use in the future, alongside with digital media and digital tools. We work closely with our customers to enhance value for their business and customers, for example by offering fit-for-purpose products and services, increasing efficiency in transactions with digital tools and by helping our customers to improve their sustainability performance. At the same time, we strengthen our

competitiveness by further lowering costs and improving our operational efficiency. Moreover, our paper products are inherently circular, using production processes that are optimised for resource efficiency to maximise value throughout their lifecycle."

**Kati ter Horst**  
Executive Vice President,  
Paper Division



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## Our renewable solutions

# Meeting consumer demand for eco-friendly and circular solutions



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## Our renewable solutions

# Replacing plastics in food packaging

Recycling alone cannot solve the plastic waste problem. To transition towards a sustainable circular bioeconomy, we need to move away from fossil-based materials. Renewable materials are the way forward. Our renewable food and beverage packaging solutions help our customers to replace plastic and meet consumer and end-user demand for eco-friendly solutions.



### End-use

- 1 Dry food, frozen food, beverage
- 2 Food service, quick-service restaurants
- 3 Cutlery, pulp for food packaging, food packaging papers
- 4 Fresh produce, fish and seafood

### Benefits for companies, brands, and consumers

- Lowering CO<sub>2</sub> emissions compared to non-renewable materials
- Improving brand perceptions through replacing plastic in packaging
- Differentiation with safe and eco-friendly solutions for fast food and food delivery services
- Helping consumers reduce plastic waste

New



### A new generation of eco-products to replace plastic

PureFiber™ by Stora Enso is a new range of ready-made formed fiber packages suitable for food service and consumer goods products. The PureFiber™ product line is plastic- and PFAS-free and enables a carbon footprint that is approximately 75% lower compared to alternative packaging materials such as plastic or bagasse. Stora Enso's formed fiber products are designed for circularity, meaning that they are renewable, recyclable and biodegradable.

Division: Packaging Solutions

New



### A new eco-friendly material for folding cartons

Perma Light™ by Stora Enso is a plastic-free, lightweight and low-carbon material for premium folding cartons. Produced with patented lightweighting technology, Perma Light™ is designed for chocolate boxes, as well as for packaging confectionery, cosmetics, and personal care products. Perma Light reduces CO<sub>2</sub> emissions during production more than 70% compared to the competition due to the mill's energy production which is free from fossil-CO<sub>2</sub> emissions.

Division: Packaging Materials

New



### A food-safe premium kraftliner for corrugated packaging

AvantForte™ by Stora Enso is a three-layer structured kraftliner for corrugated packaging, made from 100% virgin fibers. It meets brand owners' need for high-performing, safe and plastic-free packaging while using less material. AvantForte™ kraftliner is produced in Oulu, Finland, where a paper machine was converted for kraftliner production.

Division: Packaging Materials

New



### Renewable EcoFreshBox for berries

EcoFreshBox by Stora Enso is a berry box made from corrugated board as a sustainable alternative to plastic packaging. The box is easy to recycle and keeps the berries fresh for a long time. The raw material for the box is sustainably sourced Finnish wood.

Division: Packaging Solutions



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## Our renewable solutions

# Natural cosmetics & personal care

Combatting climate change and reducing the environmental impacts of packaging are high on the agenda for cosmetic brands. We help our customers to meet these new demands by offering innovative solutions made from renewable materials for cosmetics, personal care, pharmaceutical, and hygiene products. For hygiene products like diapers, feminine care, and adult incontinence products, we work together with customers to provide more environmentally friendly and low-carbon fluff pulp to meet consumer demand.

### End-use

- 1 Cosmetics packaging, pharmaceutical, and health care packaging
- 2 Fluff pulp for personal hygiene products
- 3 Rigid boxes for cosmetics, leaflets for cosmetics, and pharmaceutical packaging
- 4 Pulp for tissues, bio-based chemicals

### Benefits for companies, brands, and consumers

Opportunities to collaborate around replacing plastics in packaging with direct product contact (primary packaging)

Lowering carbon emissions with light-weight, renewable packaging

Differentiating with eco-friendly solutions for consumers who want less plastic

Reduced environmental footprint for hygiene products with renewable, traceable and biodegradable materials



### A renewable alternative to plastic cosmetics tubes

The introduction of paperboard for tubes to reduce plastic in primary packaging of cosmetics was welcomed by our customers in several acceptance test projects. We are expecting to see the first paperboard tube on the market in early 2021. The body of the tube is made from Natura Shape™ by Stora Enso, which is 70% based on renewable raw material, reducing the need for fossil-based materials.

**Division:** Packaging Materials



### Fluff pulp for hygiene and air-laid products

Fluff pulp is a soft, absorbent material created from 100% sustainably sourced Nordic spruce and pine. It is used as a raw material in disposable hygiene products, such as baby diapers, feminine care, and adult incontinence protection products, as well as in air-laid nonwoven materials used for tabletops and napkins. NaturaFluff by Stora Enso helps to meet the increasing demand for sustainable, disposable hygiene products without compromising on the end-product performance.

**Division:** Biomaterials



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## Our renewable solutions

# Plastic-free e-commerce

As online purchasing grows, so does the importance of packaging – to meet consumer requirements for a smooth and seamless unboxing and returns process. E-commerce packaging requires a careful selection of packaging materials, inserts, and structural design features that can help to safeguard the product and reduce packaging waste. Stora Enso's plastic-free and renewable e-commerce solutions help our customers to enhance the online buying experience while reducing the climate effect of online shopping.



## End-use

- 1 E-commerce packaging
- 2 Envelopes
- 3 Catalogues

### Benefits for companies, brands, and consumers

- Reduced plastic usage in online retail through fiber-based e-commerce packaging
- Optimised and smart solutions to reduce void-fill
- Intelligent features such as RFID tagging to capture a variety of data
- Improved consumer perceptions, for example through a better unboxing experience, easy returns, and reduced plastic usage



**Delivering circularity to e-commerce**  
 The ePaperBag is the circular delivery solution that is tailor-made for e-commerce to meet the demands of eco-conscious online consumers. It is a reusable bag that is efficient in e-commerce logistics and can be used to replace plastic bags. The raw material is wood fiber from sustainably managed forests, and the bag is carbon neutral.  
**Division:** Packaging Solutions



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## Our renewable solutions

# Sustainable textiles and nonwovens

While textile consumption continues to grow, consumers are increasingly aware of the climate impacts of petroleum-based artificial fibers and cotton. Dissolving pulp from Stora Enso enables the manufacture of textiles based on renewable and fully traceable wood from sustainably managed forests. For our fluff pulp, end uses in nonwovens include high-quality tabletops and napkins, and pads for food packaging containing liquids.



## End-use

- 1 Textiles
- 2 Nonwovens

### Benefits for companies, brands, and consumers

A more sustainable alternative to petroleum-based artificial fibers and cotton

Fabrics made from cellulosic-based fibers are breathable, comfortable to wear, and absorb moisture well

Enable a wider range of sustainable fashion choices for consumers



### Dissolving pulp helps shape the fabric of the future

Pure by Stora Enso, a dissolving pulp, is used primarily to make viscose staple fibers for the textile industry, for example, to replace cotton and fossil-based materials, such as polyester. Dissolving pulp is made from a renewable raw material and sourced from sustainably managed forests, with FSC® and PEFC chain of custody certifications. Viscose has significantly lower water requirements than cotton, is more sustainable than polyester, and requires less land use than wool.

**Division:** Biomaterials

\* Stora Enso Communications' FSC® trademark license number is FSC-N001919



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## Our renewable solutions

# Circular retail

Strong brands communicate their commitment to creating a greener future. We support retailers in meeting the growing consumer demand for eco-friendly and circular solutions. With our renewable materials and circular design services our customers can reduce their use of plastics, lower their carbon emissions, and reduce waste. Our circular retail solutions support needs in packaging, consumer goods, RFID technologies, and more.

### End-use

- 1 Food, grocery, and electronics packaging
- 2 Furniture, construction, interior, toys, childcare, apparel
- 3 Handles and hangers, RFID tags
- 4 Retail flyers and catalogues, pulp for specialty papers, and food packaging

### Benefits for companies, brands, and consumers

- Renewable, recyclable, and compostable solutions for a broad range of retail packaging
- Reduced plastic usage in high-volume in-store items such as coat-hangers and RFID tags
- Improved environmental footprint for everyday consumer items, such as children's toys



### Biocomposites – an affordable way to replace fossil-based plastics

Our wood-fiber biocomposites blend wood fibers and polymers – virgin, recycled, or bio-based. Biocomposites are a more sustainable alternative to fossil-based plastics with the ability to reduce the carbon footprint by up to 80% compared to fossil-based plastics. In addition, Biocomposites are an outlet for recycled plastic streams that would otherwise be sent to landfill or incinerated.

**Division:** Packaging Solutions



### A digital B2B marketplace for corrugated packaging

In 2020, Stora Enso introduced Box Inc, a new B2B platform business designed to help companies source packaging online easily and cost-efficiently. Box Inc digitalises the traditional buying process by integrating every single step on the platform – from the design of the boxes to supplier quotes and even the ordering process. As a result, companies save both time and money while choosing sustainable packaging from verified suppliers.

**Division:** Packaging Solutions



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## Our renewable solutions

# Carbon neutral buildings

Today, production of construction and building materials account for 11% of the CO<sub>2</sub> emissions related to global energy end-use. As the global building stock is estimated to double by 2060, there is a growing need to shift from non-renewable construction materials to renewable wood. Our building concepts and digital tools and services show the best ways of using wood as a construction material. Third party verified EPD's (Environmental Product Declarations) for our products and Life Cycle Assessments of wood products and buildings prove the positive climate effect of using wood.

### Building Concepts leading the way in the wood industry

To grow wood as a building material and to simplify its use in construction, Stora Enso has, together with partners, developed building concepts for wooden offices, multi-storey residential buildings, and schools. The concepts show how to create well-performing and cost-competitive buildings based on our wooden components, products, and services.  
**Division:** Wood Products

## End-use

- 1 Building materials and components for panels, columns, beams, and stairs
- 2 Building concepts for office buildings, school buildings, and multi-storey residential buildings
- 3 Services and digital tools to support the construction process
- 4 Bio-based adhesives for construction materials

### Benefits for companies, brands, and consumers

Lower CO<sub>2</sub> emissions: reduction by up to 75% when building with wood instead of non-renewable materials

Lower construction costs and less pollution: reduction of construction time by up to 70%, with up to 80% fewer truck deliveries on site

Increased health and safety for construction employees, with less noise related construction

Increased health and safety for people living or working in wooden buildings, through biophilic design, which means that occupants can feel more connected to nature

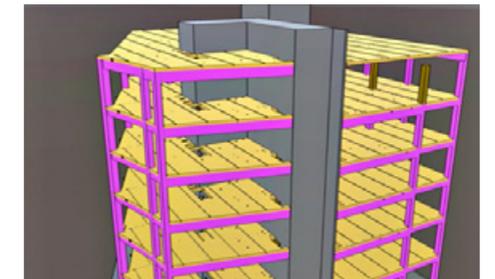
New



### Lignin-based glue reduces the carbon footprint of plywood products

Stora Enso's customer Latvijas Finieris, a birch plywood producer, is replacing phenol with lignin in resins used in their plywood. This new lignin-based glue is a bio-based solution that helps replace a fossil-based material. It significantly reduces the carbon footprint of plywood products all the way from production to final end-use applications, without compromising on technical performance.

**Division:** Biomaterials



### Digital tools to streamline sustainable construction

Stora Enso offers a range of digital solutions to expand the use of wood in construction, from design to element installation. These include: CLT360+, a mobile assistant for element installation; BIM toolbox, an essential Building Information Modelling resource for timber products; Calculatis®, timber design software for engineers; and a digital wood moisture meter and dashboard, a material monitoring solution.

**Division:** Wood Products



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## Our renewable solutions

# Sustainable print

Paper is recyclable, biodegradable, and made of renewable materials. Our products are manufactured from responsibly sourced wood, and the origin of the wood we use is 100% traceable. More than 90% of our paper brands hold ecolabel certification recognizing their reduced environmental impact over the product life cycle.

### End-use

- 1 Newspapers, magazines
- 2 Catalogues, flyers, and leaflets
- 3 Book papers and covers
- 4 Office paper, graphical board, pulp for paper

### Benefits for companies, brands, and consumers

Products manufactured from responsibly sourced wood that is 100% traceable

More than 90% of our wide product offering is covered by one or more recognised eco-labels

Business models and services aimed to enhance business and sustainability performance

New

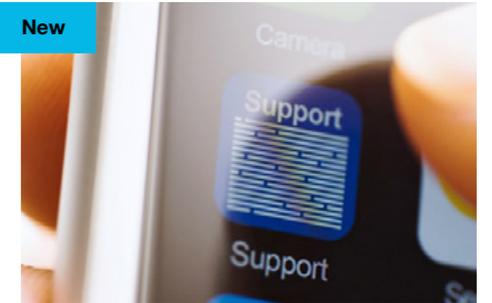


### The new-generation uncoated magazine paper

PrimaPlus by Stora Enso is a new uncoated magazine paper that performs like a lightweight coated paper. It has the brightness and gloss but with added bulk for a pleasant touch and feel. The raw material used in PrimaPlus comes from Scandinavian forests, is completely traceable, and is FSC and PEFC certified.

Division: Paper

New



### A new digital solution to support customers remotely

To drive efficiency, Stora Enso and the startup company Snap Support launched a new digital solution, Snap Support by Stora Enso, for remote technical customer services. The solution includes a mobile application used to transfer real-time information and media whenever a customer encounters challenges or has questions related to their printing and converting processes.

Division: Paper



## Strategy

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## Our renewable solutions

# Low-carbon industrial solutions

In the face of climate change, producers, retailers, and brand owners are being forced to rethink every step of the supply chain – from raw material sourcing, to production, to packing, and logistics. Packaging is a critical area as it accounts for 40% of the world's plastics – most of which are made from fossil oil.

## End-use

- 1 Corrugated boxes
- 2 Industrial and heavy-duty packaging, industrial components
- 3 Recycled minerals, bio-based chemicals and adhesives

## Benefits for companies, brands, and consumers

Reduced weight in transport and storage solutions

Reduced carbon footprint by replacing engineered plastic products and components with biocomposite solutions

Replacing fossil-based materials in applications such as bioplastics, biochemicals and biofuels

Increased circularity and reduced carbon footprint with recycled minerals

New



## A recycled mineral from paper and board production

VersaLime™ by Stora Enso is a recycled mineral from pulp and paper refinement processes that can be used to reduce the carbon footprint of products. It replaces non-renewable materials with a circular by-product which can be applied in, for example, lightweight concrete, cement raw material, or infrastructure uses.

**Division:** Paper



## Corrugated solutions for industrial and heavy-duty packaging

Stora Enso's corrugated packaging for industrial and heavy-duty end-uses offers a sustainable and strong but light solution that helps our customers save on logistics costs and reduce emissions. Less packaging material also means reduced waste and, as a result, a smaller environmental footprint.

**Division:** Packaging Solutions



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## Group Leadership Team



**Annica Bresky**  
President and Chief Executive Officer (CEO)



**Seppo Parvi**  
Chief Financial Officer (CFO), Deputy to the CEO, Country Manager Finland



**Tobias Bäärnman**  
Chief Strategy and Innovation Officer, member of GLT as of 1 November 2020



**David Ekberg**  
Executive Vice President, Packaging Solutions Division, member of GLT as of 1 April 2020



**Johanna Hagelberg**  
Executive Vice President, Sourcing and Logistics



**Kati ter Horst**  
Executive Vice President, Paper Division



**Hannu Kasurinen**  
Executive Vice President, Packaging Materials Division



**Katariina Kravi**  
Executive Vice President, Human Resources as of 1 September 2020



**Ulrika Lilja**  
Executive Vice President, Communications and Marketing



**Per Lyrvall**  
Executive Vice President, Legal, General Counsel, Country Manager Sweden



**Markus Mannström**  
Executive Vice President, Biomaterials Division



**Teemu Salmi**  
CIO, Head of IT & Digitalisation, member of GLT as of 1 November 2020



**Annette Stube**  
Executive Vice President, Sustainability as of 1 September 2020



**Jari Suominen**  
Executive Vice President, Forest Division



**Lars Völkel**  
Executive Vice President, Wood Products Division as of 1 July 2020

For more detailed information about the Group Leadership Team, see **Governance 2020**, or [storaenso.com/investors/governance](https://storaenso.com/investors/governance).



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