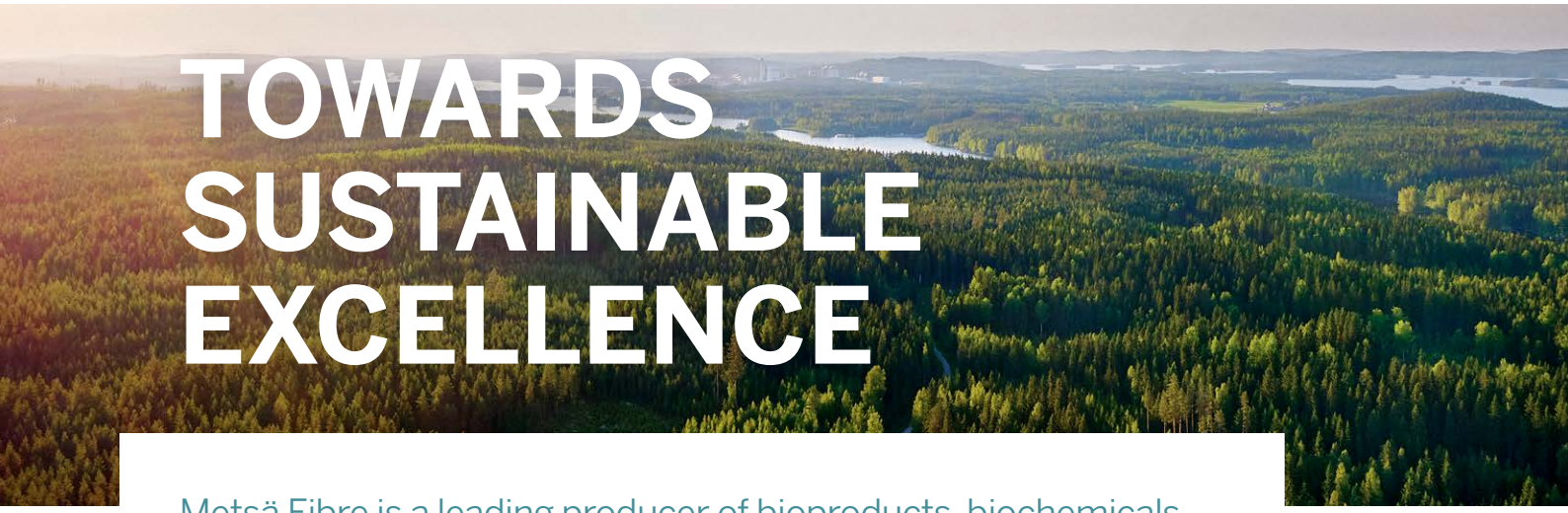
Metsä

METSÄ FIBRE
Annual review 2021



TOWARDS SUSTAINABLE EXCELLENCE

Metsä Fibre is a leading producer of bioproducts, biochemicals and bioenergy. We are the world's biggest producer of softwood market pulp and a major producer of sawn timber.

We want to be the most sought-after and profitable producer of bioproducts made from Nordic wood, and a frontrunner in the creation of sustainable growth. We create sustainable growth from renewable wood raw material, and our products can be used to replace fossil-based materials. Metsä Fibre is part of Metsä Group.

Review of Metsä Fibre's year 2021 by CEO Ismo Nousiainen

In 2021, we remained focused on implementing our strategy and developing our company. We have systematically advanced our investment projects in Kemi and Rauma, and made continuous improvements in all our operations despite the exceptional circumstances caused by the Covid-19 pandemic. During the pandemic, we have placed a high priority on ensuring the health and safety of our personnel, bearing our social responsibility for the prevention of virus infections and chains of virus transmission, safeguarding our ongoing operations and ensuring reliable product deliveries to our customers.

Global demand for market pulp fell from the previous year. It was seen in both softwood and hardwood pulp and in China in particular. In contrast, the consumption of market pulp in Europe grew, especially in the printing and writing paper, paperboard, and speciality papers end-use segments.

Demand for sawn timber was at a good level across all main markets until the late summer. In many markets, demand even exceeded supply. During the autumn, customers' stocks grew, and demand for sawn timber took a downturn, but recovered during the rest of the year in all main markets.

In 2021, Metsä Fibre's operating result increased significantly on the exceptionally low level of the previous year. The increase in sales and operating profit was mainly driven by higher prices and volumes of pulp and sawn timber as compared to 2020.

Sustainable growth

Nordic wood is a premium renewable resource and the core of our business. We create sustainable growth from renewable wood raw material, and our products provide sustainable solutions to global challenges. Pulp has significant potential as a raw material to replace fossil raw materials, and as wood products store carbon in the long term, they play an important role in combating climate change.

We source our wood from sustainably managed northern forests that grow more than they are used, and we use raw materials efficiently. We produce renewable energy and other bioproducts from the side streams of production.

Thanks to carefully planned investments, our production units represent the cutting edge of the industry in environmental performance, energy efficiency or profitability. We invest in fossil-free mills and world-class resource efficiency. Our business is based on continuous improvement, and our key projects in 2021 have been the construction of the Rauma pine sawmill and the Kemi bioproduct mill.

Investments are making progress

An investment decision on the new pine sawmill in Rauma was made in March 2020, and construction work at the mill site began in May 2020. In 2021, the project progressed according to the planned overall schedule and production at the mill will begin during the third quarter of 2022. The sawmill will be a worldwide forerunner in technology and efficiency. The new capacity will help us respond competitively to the growing global demand for high-quality sawn timber and to further improve the reliability of our deliveries.

We will also continue to develop our unique bioproduct mill concept. On 11 February 2021, we made the investment decision to build a bioproduct mill in Kemi. This is the largest ever investment in Finland in the history of the Finnish forest industry. The project has progressed as planned during 2021, and the mill should be completed in the third quarter of 2023.

The new bioproduct mill will strengthen both our production capacity and environmental performance. It will enable us to meet the growing global demand for pulp and strengthen our position as a leading producer of market softwood pulp.

The investments will bring our goal of fossil fuel-free production closer. The new bioproduct mill in Kemi will operate entirely without fossil fuels and will be world class in terms of energy, material and environmental efficiency. The sawmill investment in Rauma, in turn, will enable the transition of the Rauma integrated mill to fossil-free production in the future.

In both projects, the degree of Finnish origin in the construction work is high and the employment impact significant. Our ambitious goals and technological requirements also encourage our partners to develop their equipment and technology solutions and thus improve their own competitiveness.

I want to thank our employees, customers and partners for their great collaboration in 2021!

Ismo Nousiainen
CEO
Metsä Fibre Oy

2021 key figures

2021 highlights

Foundation stone of Rauma sawmill was laid

The foundation stone of Metsä Fibre´s new Rauma sawmill was laid on Thursday 25 March 2021. Construction work of the world's most modern pine sawmill has advanced in line with the master schedule. The value of the investment is approximately EUR 200 million, and production is scheduled to start at the sawmill during the third quarter of 2022. This will be the largest sawmill investment ever in Finland, and the Rauma sawmill will be a frontrunner in technology and efficiency at a global level.

Foundation stone of Kemi bioproduct mill was laid

The foundation stone of Metsä Fibre´s new Kemi bioproduct mill was laid 13 September 2021. The bioproduct mill project is progressing according to plan. The final investment decision was made on 11 February 2021. The value of the investment will be EUR 1.6 billion, which makes it the largest investment in the history of the Finnish forest industry. The fossil free mill will produce approximately 1.5 million tonnes of softwood pulp and birch pulp annually, as well as numerous other bioproducts.

Metsä Fibre awarded for its sustainability work

Metsä Fibre received again the EcoVadis platinum-level award – the highest possible level – for its efforts to promote sustainability, and is among the top one per cent of pulp paper and paper carton manufacturers assessed by EcoVadis. Metsä Fibre received recognition for work related to the environment, working life practices, ethics and supply chains. Metsä Fibre's operations received particularly good reviews (90 out of 100 points) in relation to environmental matters and we improved our performance in the Sustainable Procurement sector.

Cooperation concerning biogas processing

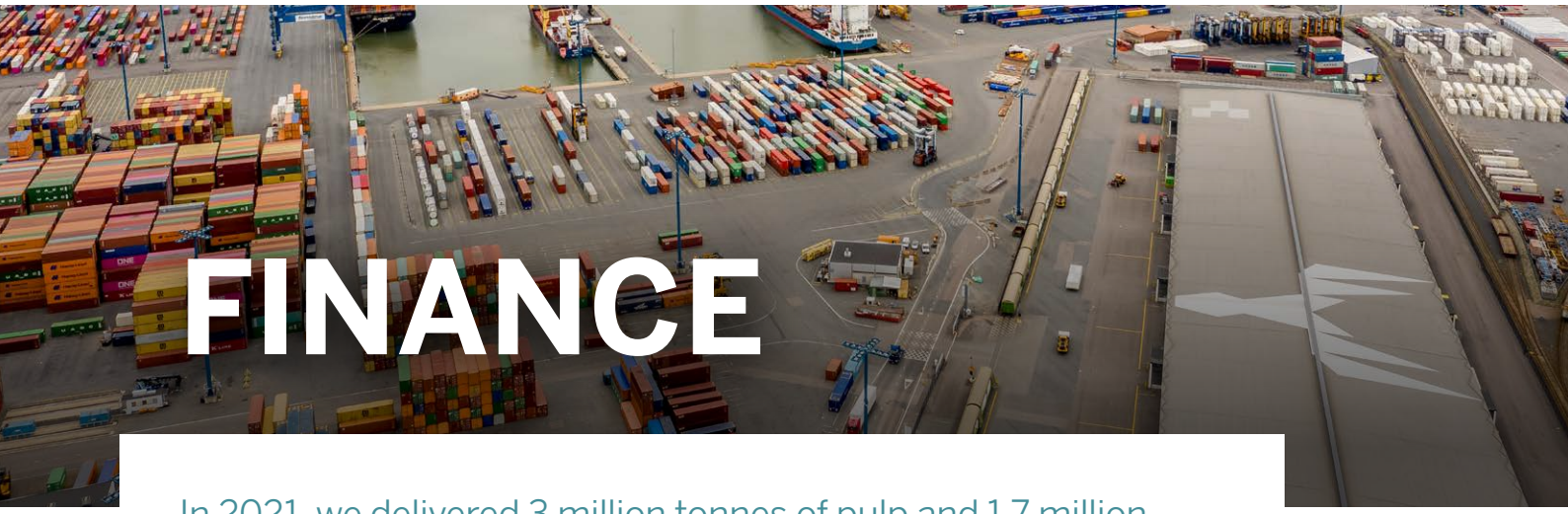
Metsä Fibre and Gasum agreed on cooperation concerning biogas processing at the biogas plant operating as part of Äänekoski bioproduct mill. Metsä Fibre is in charge of the plant's overall operations, while Gasum is responsible for the daily remote operation and maintenance of biogas processing. Gasum is purchasing the biogas produced at the plant for use as transport fuel.

Metsä Fibre awarded by Sofidel's Suppliers Sustainability Award

Metsä Fibre received Sofidel's Suppliers Sustainability Award (3SAward) 2021 as the Best Supplier in Pulp Producer category. The award is granted to partners who stand out for their commitment to environmental and social sustainability actions.

Follow the progress of construction work at Kemi and Rauma

We want to keep our customers and other key stakeholders updated about the Metsä Fibre Kemi bioproduct mill and Rauma sawmill construction projects. You can follow the progress of construction work from our webcams and see the latest updates on our web pages www.metsafibre.com.



FINANCE

In 2021, we delivered 3 million tonnes of pulp and 1.7 million cubic metres of sawn timber to our customers. We are the world's leading producer of bleached softwood market pulp and a major producer of sawn softwood. We aim to strengthen our position further in both the pulp and sawn timber business. To achieve this goal, we will build the world's most modern pine sawmill in Rauma, as well as a new bioproduct mill in Kemi.

Key figures

	2021	2020	2019	2018	2017
Sales EUR million	2,628	1,826	2,236	2,469	1,876
Comparable operating result EUR million	648	4	249	669	320
Investments EUR million	647	132	63	62	436
Return on capital employed %	31	0.2	12	35	24
Equity ratio %	61	55	57	55	48
Net gearing ratio %	13	15	10	1	35

Read more about Metsä Fibre's year 2021 in CEO Ismo Nousiainen's review.

You can find the development of our key indicators over a five-year period from the page 28.

Production

Metsä Fibre has four pulp mills and six saw mills.

Our pulp mills are located in Joutseno, Kemi, Rauma and Äänekoski. Their combined annual pulp production capacity is 3.3 million tonnes and we are the world's leading producer of bleached softwood market pulp.

Our Finnish sawmills are located in Kyrö, Lappeenranta, Merikarvia, Renko and Vilppula and in addition to these, we have one sawmill in Russia, in Svir. Our combined annual production capacity for sawn timber is 1.8 million m^3 of sawn softwood.

Pulp production (1,000 tonne)

	2021	2020	2019	2018	2017
Joutseno	650	574	638	675	655
Kemi	596	570	566	593	598
Rauma	598	541	600	557	568
Äänekoski*	1,156	1,134	1,143	1,148	666
Total	**3,000**	**2,819**	**2,948**	**2,973**	**2,487**

*) The previous Äänekoski mill in production until 8/2017, and the new bioproduct mill as of 8/2017. 2017 production figure represents the combined production at Äänekoski in 2017.

Sawn timber production (1,000 m^3)

	2021	2020	2019	2018*	2017
Kyrö	221	196	221	228	232
Lappeenranta	219	206	238	243	253
Merikarvia	197	179	214	220	223
Renko	286	257	290	308	310
Vilppula	505	488	491	510	514
Metsä Svir	282	268	288	281	274
Total	**1,710**	**1,593**	**1,741**	**1,819**	**1,852**

*) Eskola sawmill was part of Metsä Fibre until 7/2018.

Sales

Pulp sales

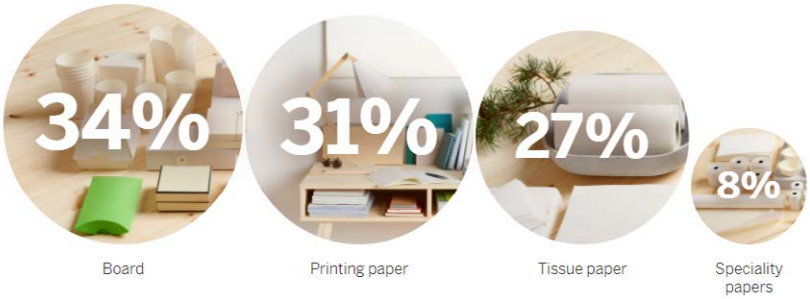
We manufacture softwood and hardwood pulp. The end products of softwood pulp have excellent strength properties, while hardwood pulp improves the surface properties of products.

All pulp grades in the Metsä range are certified and meet the purity criteria for products that come into contact with food, for example. The most important end uses of Metsä pulp are paperboards, tissue papers, printing papers and speciality products.

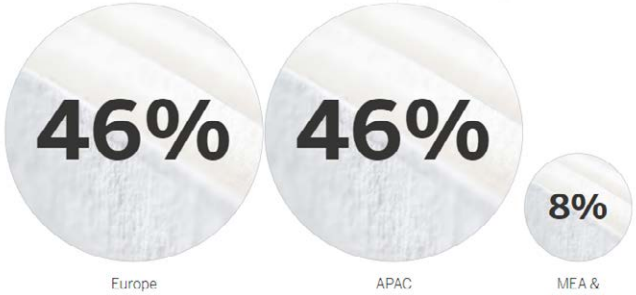
Most of the pulp we produce is used in Finland and Asia. Market pulp accounts for approximately 70 per cent of the pulp deliveries. The main market area of our market pulp is APAC (Asia-Pacific).

We develop our pulp grades in close collaboration with our customers to ensure that our products meet their requirements for the properties of the fibre and paper. Our pulp selection is complemented by our diverse expert services, which allow us to support our customers' processed and business operations.

End use of Metsä pulp



Pulp sales volumes by market areas, %



Sawn timber sales

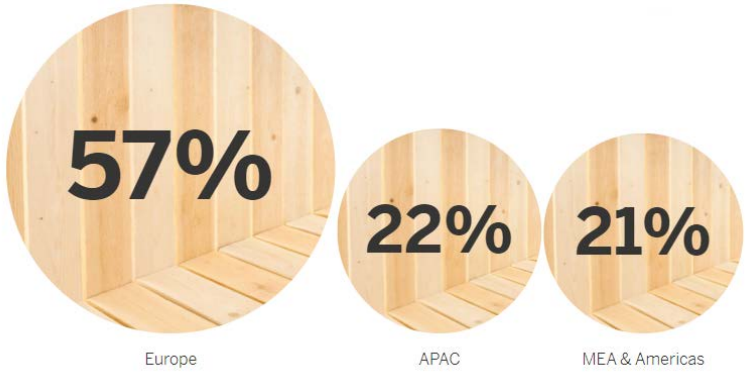
We produce premium sawn timber from northern pine and spruce, and serve customers around the world.

Our most important export markets for sawn timber are Europe, Asia and the Middle East. We export some 90% of our spruce sawn timber and some 80% of our pine sawn timber.

Our sawn timber is delivered mainly to distributors for use in living and joinery, construction and furniture industries as well as in packaging. Our efficient production lines combined with our strong know-how ensure a high-quality, smooth and even sawn surfaces, precise dimensions and excellent drying results.

End use of sawn timber, %

Sawn timber sales volumes by market areas, %



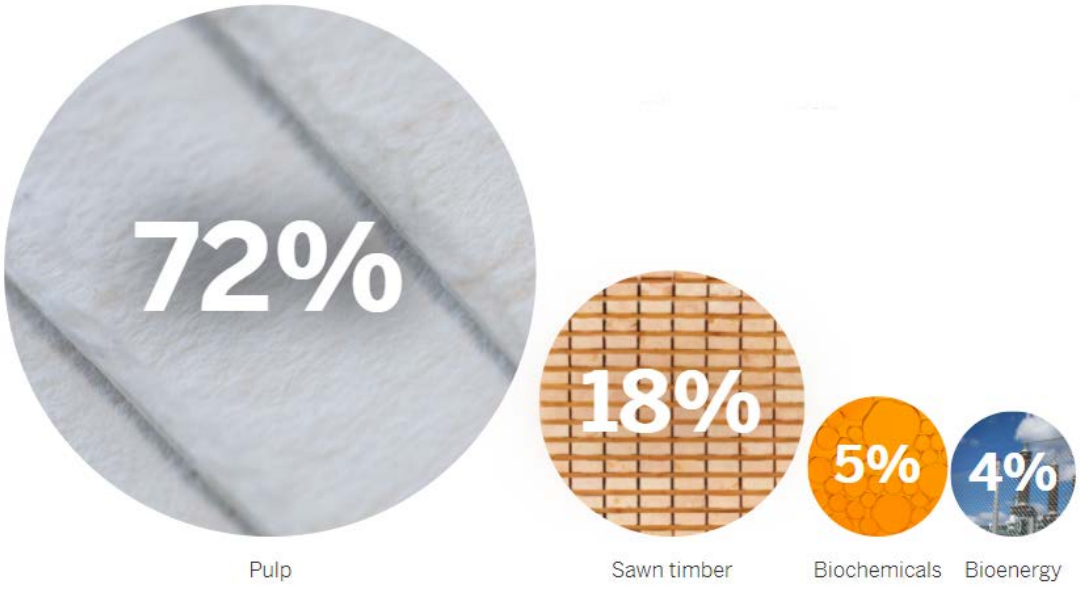
Other bioproduct sales

Metsä Fibre is a leading producer in the world market of chemicals derived from northern wood. We produce crude tall oil and crude turpentine as well as bioenergy as a by-product of pulp production.

- **Crude tall oil** is used as a raw material in the production of adhesives, rubbers and inks as well as pharmaceuticals and biofuels. It is also used as a binding agent in cement and asphalt.
- **Crude turpentine** is a compound used, in a processed form, in fragrances, cosmetics, paint, varnish and solvents, and in household and industrial detergents.
- We supply **bioenergy** in the form of district heat to local communities and electricity to the grid.

We have made a commitment to utilize our wood raw material as efficiently and diversely as possible. The material side streams accumulating from the main production of pulp offer a wide range of possibilities for the development and conversion of innovative bioproducts.

The share of bioproducts of our sales in 2021



Read more

Megatrends encourage the use of pulp and sawn timber

Environmental concerns, demographic changes, and evolving technology are the key megatrends of the 21st century. Their impact is also visible in Metsä Fibre's strategy and day-to-day operations, as solutions for many of the world's problems are to be found in wood or fibre-based products.

New bioproduct mill in Kemi meets the growing demand of pulp

Metsä Fibre is building a new bioproduct mill which will be the largest wood processing mill in the northern hemisphere. Kemi's current pulp mill will continue to operate until the new mill is ready to start. According to the megatrends, the need for long-fibre softwood pulp will increase in the future.

What is the bioproduct mill about?

The core idea of our bioproduct mill concept is to fully utilise wood and production side streams for pulp, other bioproducts and bioenergy that can replace fossil-based materials and fuels. Energy self-sufficiency and a water cycle that is as closed as possible are also essential elements in the concept.

Artificial intelligence smooths processes and predicts disruptions

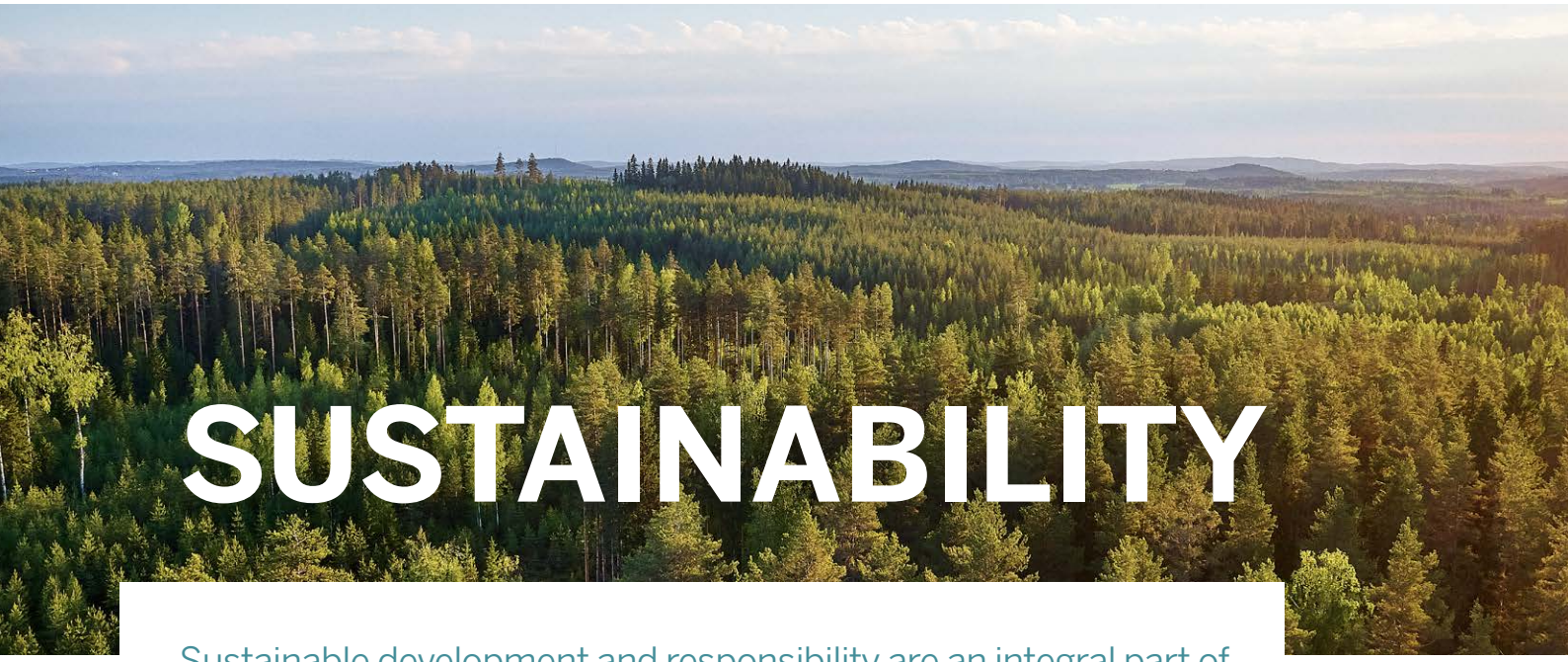
For decades, highly automated pulp mills have been at the forefront of digitalisation. Digital applications continue to improve, boosting the internal efficiency and consistent quality of pulp production, as well as improving customer service. Rapidly developing technology continues to offer new opportunities to make mill processes run more smoothly and make fuller use of accumulated process data.

Wood used increasingly in construction and fittings

As architects seek responsible solutions, they are using steadily more wood as a building material and for interiors. Wood demand is also being boosted by consumers looking for sustainable choices. With further treatment, the fine properties of wood can become even more diverse.

The Maritime Logistics Service Centre makes deliveries more reliable

The Maritime Logistics Service Centre supervises Metsä Group's global transport of pulp and sawn timber. Its job is to make sure deliveries reach their destination as agreed and that customers know when to expect them.



SUSTAINABILITY

Sustainable development and responsibility are an integral part of all our operations. We use Nordic wood from sustainably managed forests and make products that can replace fossil-based raw materials and other materials in a resource-efficient manner.

We ensure environmental, energy and materials efficiency as well as the high quality of our products, and we aim for sustainable excellence through continuous improvement.

Our operations support the achievement of the UN's Sustainable Development Goals.

Sustainable Development Goals 2030

Metsä Group's strategic sustainable development goals for 2030 create a path towards a climate-neutral society. Metsä Fibre plays an important role in achieving these goals. Learn more about our sustainability objectives.

Target	Status	Actions	UN Sustainable Development Goals
Forest			
Carbon sequestered in forests Increasing the amount of carbon sequestered in forests by +30 per cent from 2018 level.		This is a sustainability objective for the entire Metsa Group and a sustainability measure at Metsä Forest.	
Carbon sequestered in products Increasing the amount of carbon sequestered in products by +30 per cent from 2018 level.		We will construct a new pine sawmill in Rauma. The investment will increase the volume of our sawn timber production by 40%.	
Biodiversity of forest nature Safeguarding the biodiversity of forest nature, increasing the amount of decaying wood.		This is a sustainability objective for the entire Metsä Group and a sustainability measure at Metsä Forest.	
Climate and the environment			
Fossil free mills Fossil CO2 emissions 0, share of fossil free fuels 100%.	2019: 96 % 2020: 96 % 2021: 97 %	• New Kemi bioproduct mill. • New Rauma sawmill and the utilisation of the Rauma pulp mill's side streams in energy production. • Fossil free support fuels for the Joutseno and Rauma mills. • Fossil free fuels for thermal power stations.	
Resource-efficient production Full utilisation of solid production side streams.	2019: 75 % 2020: 83 % 2021: 85 %	Identifying new applications for green liquor dregs generated as a side stream of pulp production.	
Resource-efficient production Enhancing the use of process water at pulp mills by 25 per cent per product tonne (m³/t) in 2018–2030.	2019: + 4 % 2020: + 11 % 2021: - 1 %	• New Kemi bioproduct mill. • Mill specific action plans, their implementation and updating.	
Sustainable choices			
Fossil free raw materials Share of fossil free raw materials 100%.	2021: Metsä Fibre 99.99% Pulp: 100% Sawn timber: 99.99%	Replacing sawn timber wraps with fossil free alternatives.	
Sustainable supply chain All our suppliers operate according to the set environmental, social and economic sustainability requirements (Supplier Code of Conduct).	2019: 92 % 2020: 95 % 2021: 97 %	The sustainability of suppliers is ensured by committing them to the Supplier Code of Conduct, and by evaluating and auditing them.	
Sustainable supply chain Full traceability of raw materials.	2019: 95 % 2020: 96 % 2021: 96% (wood raw material 100%)	The traceability of raw materials and the countries of production will be reviewed with producers in connection with product safety surveys.	
Safety and wellbeing			
Safe and accident–free work environment Accident rate (LTA1) 0.	2019: LTA1 8.7 2020: LTA1 6.6 2021: LTA1 7.6	• Active and systematic proactive safety work involving all employees. • Metsä Group's safety management principles and processes that make the management of safety at work within the Group more consistent. • Close safety cooperation with service providers and other partners.	
Responsible corporate culture Ethics index resulting from the ethics barometer 100%. *) The first ethics barometer was conducted in 2020, and in the future, it will be conducted every two years in connection with the personnel survey	2020: 83.5%*	Analysing the results of the ethics barometer conducted every two years with the personnel and using the results in operational development.	

In 2021, we received EcoVadis' highest platinum level recognition for our work on sustainability. With this result, we are among the top one per cent of pulp, paper and paperboard manufacturers assessed by EcoVadis.

Use of wood

All of the wood we use, meaning 100% of it, is traceable and comes from certified or controlled forests. This allows us to ensure the legality of the wood supply as well as the acceptability and sustainability of the supply chain. A tracing system allows us to trace the origin of the wood we purchase all the way up to an individual felling site.

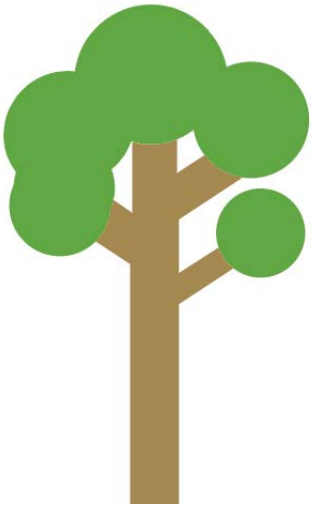
The northern wood used by Metsä Fibre is bought from sustainably managed forests in areas where the forests grow more than they are used. 90% of the wood used by Metsä Fibre is certified – an excellent figure in our line of business.

Forest regeneration is always part of sustainable forest management, and we require environmental values to be considered in all forestry measures. A forest is always regenerated after a felling, and Metsä Group uses domestic tree species and seedlings in forest regeneration. The diversity of forest nature is also protected in many ways.

We use every part of the tree in the best possible way to create the most value. We use logs at sawmills, and produce pulp and other bioproducts from pulp wood and sawmill chips. Branches and treetops are used to produce bioenergy.

	2021	2020	2019	2018	2017
Total wood consumption million m³	19	18	19	19	17
Share of certified wood %	90	90	90	92	92

We utilize wood 100%



15 %
Bark, branches and treetop
For renewable energy

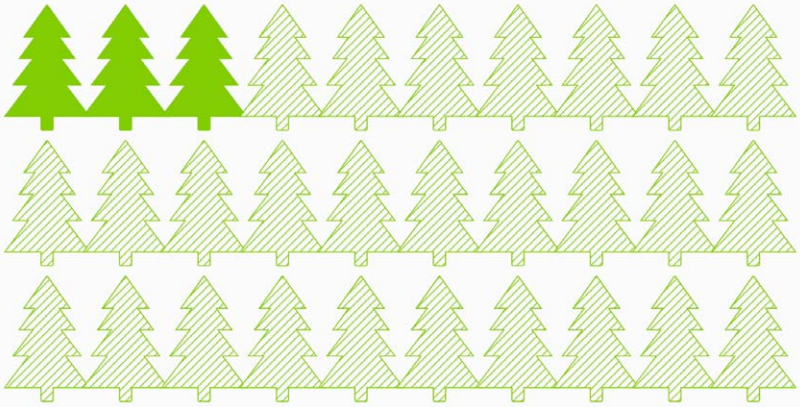
25 %
Pulpwood
For pulp and other bioproducts

60 %
Log wood
For sawn timber and other wood products

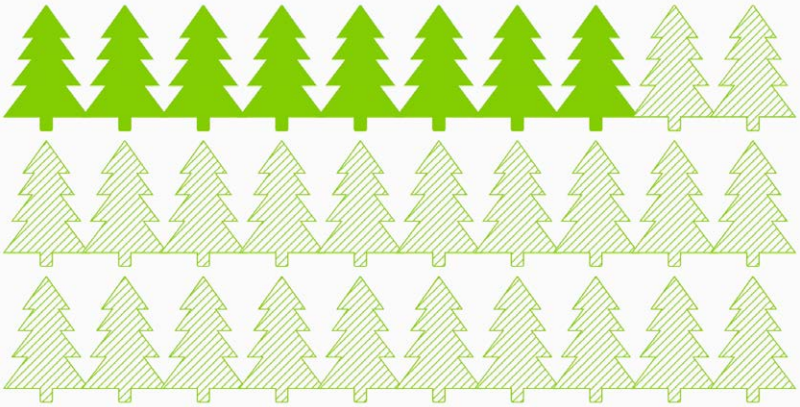
An independent external assurance has been performed for the data in the tables as part of Metsä Group's Sustainability Report.

Forest certification

Around **10%** of the world's forests are certified



Only **25%** of the (industrially) recoverable forest assets are certified



90% of the wood used by the Metsä Fibre's production units comes from certified forests

Environmental performance

Emissions into water

Our sustainability goals include decreasing the use of process water per product tonne throughout Metsä Group by 25% by 2030. To achieve this goal, we engage in long-term and systematic work in line with the principles of continuous improvement.

The steady operation and good usability of production units as well as scheduled preventive maintenance and maintenance shutdowns play a key role in increasing the efficiency of water use. We use and recycle water as efficiently as possible within our processes and actively look for new targets where the water flow can continue to be improved.

The sawmills' production processes generate nominal volumes of wastewater, which is treated in municipal wastewater treatment plants. The exception to this is the Svir sawmill, which has its own wastewater treatment plant.

	Process water volume 1,000 m³	Total suspended solids t	Chemical oxygen demand (COD) t	Biological oxygen demand (BOD) t	Phosphorus P t	Nitrogen N t	AOX t
Joutseno	17,637	732	6,887	134	8	87	92
Kemi	18,006	409	7,671	125	4	93	66
Rauma	13,656	195	9,653	100	3	57	74
Äänekoski	21,259	317	7,540	147	6	63	122
Total	**70,559**	**1,653**	**31,751**	**506**	**21**	**300**	**355**
2020	71,382	2,013	31,229	526	23	389	353

You can find more information on the five-year trend of the environmental performance indicators on page 28 of the report.

Definitions of the terms can be found on page 33 of this report.

An independent external assurance has been performed for the data in the tables as part of Metsä Group's Sustainability Report.

Emissions into air

Our sustainability goals include fossil-free mills by 2030. Even today, most of the fuels used in our production are bio-based, and the majority of them are production side streams. Among the materials we use as energy are bark, black liquor produced in pulp production and sawdust from sawdust sawn timber production.

The increase in fossil-based CO_2 emissions figures in 2019 is explained by the incorporation of the Äänekoski energy production unit (formerly Äänevoima Oy) into Metsä Fibre in 2019. The unit produces energy for the Äänekoski integrated mill (excluding the bioproduct mill) and district heating for the town of Äänekoski.

By utilising the side streams generated in the process as extensively as possible, we improve the resource, energy and environmental efficiency of our production facilities.

Pulp mills

	Sulphur dioxide (as SO_2) t	NOX (as NO_2) t	CO_2 from fossil sources 1,000 t	CO_2 from biomass 1,000 t	Particles t	TRS (as S) t
Joutseno	316	1,056	16	1,600	123	5
Kemi	74	1,294	66	1,454	70	19
Rauma	20	1,117	70	1,363	196	9
Äänekoski	13	1,609	0	3,008	30	6
Energy Unit*	54	105	35	255	1.5	0
Total	**476**	**5,181**	**187**	**7,680**	**421**	**38**
2020	463	4,748	224	7,262	507	49

*) The energy production unit (formerly Äänevoima Oy) produces energy for the Äänekoski integrated mill and district heating for the town of Äänekoski. The unit was incorporated into Metsä Fibre in 2019.

Sawmills

	Sulphur dioxide (as SO_2) t	NOX (as NO_2) t	CO_2 from fossil sources 1,000 t	CO_2 from biomass 1,000 t	Particles t
Kyrö	3	22	1	26	22
Lappeenranta	0	50	0	27	4
Merikarvia	0	19	0	23	13
Renko	1	14	0	27	6
Vilppula	16	41	2	85	12
Metsä Svir	0	40	0	21	2
Total	**21**	**185**	**4**	**208**	**58**
2020	17	183	5	193	50

Total

	Sulphur dioxide (as SO_2) t	NOX (as NO_2) t	CO_2 from fossil sources 1,000 t	CO_2 from biomass 1,000 t	Particles t	TRS (as S) t
Company total	**496**	**5,366**	**191**	**7,887**	**479**	**38**
2020	480	4,930	229	7,455	557	49

An independent external assurance has been performed for the data in the tables as part of Metsä Group's Sustainability Report.

Waste

Our goal is to utilise production side streams fully by 2030 and to achieve a state in which our production will not generate landfill waste. Already, an extremely large portion of production side streams can be put to use as various by-products and energy. At the moment, the green liquor dregs generated in the pulp process is the only category for which there is not yet a clear use. We are actively looking for applications in which it could be used and the topic is also the subject of research projects.

Pulp mills

	Landfill waste t	Hazardous waste t
Joutseno	10,415	205
Kemi	11,936	49
Rauma	14,152	61
Äänekoski	4,941	148
Total	**41,446**	**462**
2020	41,433	264

Sawmills

	Landfill waste t	Hazardous waste t
Kyrö	0	2
Lappeenranta	0	1
Merikarvia	40	7
Renko	0	5
Vilppula	0	1
Metsä Svir	5	0
Total	**45**	**17**
2020	794	96

Total

	Landfill waste t	Hazardous waste t
Kyrö	0	2
Lappeenranta	0	1
Merikarvia	40	7
Renko	0	5
Vilppula	0	1
Metsä Svir	5	0
Total	**45**	**17**
2020	794	96

An independent external assurance has been performed for the data in the tables as part of Metsä Group's Sustainability Report.

Energy

The self-sufficiency rate of Metsä Fibre's mills in terms of electrical energy totals 151 %, and we are a significant producer of bioelectricity. In 2021, Metsä Fibre accounted for 7,5% of the electricity produced from renewable energy sources in Finland, and 11% of renewable energy.

In addition to our own production, we produce bioenergy for the grid as electricity and as district heat for nearby communities.

Alongside increasing the share of bioenergy, we are focusing on energy efficiency and the replacement of fossil fuels by renewable fuels. Improving the energy efficiency of our production units is a key part of our investments in production.

Pulp mills

	Wood based fuel use GWh	Fossil fuel use GWh	Purchased electricity GWh	Purchased heat GWh	Electricity self-sufficiency %
Joutseno	4,041	81	28	−40	93
Kemi	3,671	231	−150	−480	140
Rauma	3,441	245	−192	−138	150
Äänekoski	7,596	0	−606	−217	193
Energy Unit*	644	105	21	−531	
Total	**19,393**	**663**	**−920**	**−1,407**	**151**
2020	18,339	805	−1,129	−1,196	168

*) The energy production unit (formerly Äänevoima Oy) produces energy for the Äänekoski integrated mill and district heating for the town of Äänekoski. The unit was incorporated into Metsä Fibre in 2019.

Sawmills

	Wood based fuel use GWh	Fossil fuel use GWh	Purchased electricity GWh	Purchased heat GWh
Kyrö	65	3	15	0
Lappeenranta	67	0	17	0
Merikarvia	58	2	15	−10
Renko	67	2	7	0
Vilppula	214	8	13	−61
Metsä Svir	53	0	13	0
Total	**524**	**15**	**80**	**−71**
2020	487	17	78	−56

Total

	Wood based fuel use GWh	Fossil fuel use GWh	Purchased electricity GWh	Purchased heat GWh
Company total	**19,917**	**678**	**−839**	**−1,407**
2020	18,825	822	−1,052	−1,252

An independent external assurance has been performed for the data in the tables as part of Metsä Group's Sustainability Report.

The continuous development

Our operations promote sustainability every day of the year

Metsä Fibre is committed to promoting sustainability, carbon neutrality and resource efficiency through its operations. Clean water, the circular economy and action against climate change are topics to which Metsä Fibre wants to contribute.

Key ways to do so include reducing fossil-based carbon dioxide emissions and using materials resource efficiently and sustainably. We engage in long-term systematic work to achieve our sustainability objectives. In accordance with the principles of continuous improvement, we take sustainability into consideration in all our action plans and investments.

Working systematically towards our 2030 objectives

The target of Metsä Group is fossil free mills by 2030, and we are moving systematically towards this objective. Biofuels already account for the major of fuel used in Metsä Fibre's production. No fossil fuels are used in the production of the Äänekoski bioproduct mill, and the same fossil free mill concept will be adopted at the new bioproduct mill constructed in Kemi. The state-of-the-art sawmill under construction in Rauma will utilise in its operations bioenergy produced by the Metsä Fibre Rauma pulp mill. In the future, the new sawmill will enable fossil free operations throughout the integrated mill.

The enhanced use of process water is another key sustainability objective. Metsä Group aims to reduce its use of process water by 25 per cent per product tonne in 2018–2030. In 2021, Metsä Fibre's pulp mills carried out systematic efforts to increase the efficiency of water use. We have conducted surveys on water use and based on the results, have identified potential areas in which reductions can be achieved. We have also systematically carried out practical measures aimed at reducing the use of process water. In Äänekoski and Joutseno, we successfully reduced the amount of process water by enhancing the internal recycling of water and separating clean water from water destined for the wastewater treatment plant. We will continue to enhance our use of process water and survey technological solutions.

Our goal is to make full use of production side streams in the form of bioproducts or bioenergy by 2030. Our main measures in this respect focus on green liquor dregs generated in pulp production, for which no lasting use has yet been found. In 2021, a new centrifuge was introduced in Rauma to enhance the dewatering of green liquor dregs. This solution will reduce the amount of green liquor dregs in the future. A new storage area was built for waste management in Äänekoski, and production side streams such as green liquor dregs were used to replace raw materials in its structures. The area will be finalised in 2022.

Proactive environmental work as part of daily operations

Reliable process and emissions measurements lay the foundation for daily production control and environmental performance monitoring. For example, we use continuous measuring devices and analysers, whose operations we ensure with a comprehensive preventive maintenance programme, involving production, maintenance and laboratories. To ensure the reliability of our measuring devices

and analysers, hundreds of analyses and quality assurance measurements are carried out by laboratories at our mills. In addition, external experts conduct comprehensive surveys of the impacts on water bodies, air quality and noise at our mill locations.

We carry out active, preventive environmental work daily to minimise our environmental impacts. The field tours and environmental observations made by our employees are an important supplement to measurements, as they help us observe deviations and react to them as early as possible. In 2021, a total of 736 environmental observations were recorded at our pulp mills and sawmills. Our mills review the observations daily and ensure that the required corrective actions are taken to address changes and deviations.

In 2021, all our mills successfully kept their load on water bodies below the limits set by the environmental authorities. Concerning air emissions, our operations fell short of the requirements in three cases. At the Rauma pulp mill, the permitted limit for the concentration of TRS (total reduced sulphur compounds) discharged into the air from the lime kiln was briefly exceeded. In addition, the chlorine content of vapour discharged into the air from bleaching exceeded the permitted limit in the annual one-off measurement in Rauma. The odour concentration at the biogas plant of the Äänekoski bioproduct mill exceeded the limit in a one-off measurement. In each of these cases, we analysed the reasons for the disturbances and immediately took corrective action to restore operations to the normal level.

Cooperation with stakeholders and partners

We collaborate actively and openly with various stakeholders. In connection with the Kemi bioproduct mill project, we have organised several stakeholder meetings and events open to the public at which we have described the project's progress and the new mill. A virtual event for the public was also organised in June 2021 to discuss the Rauma pine sawmill project. The progress of both projects can be followed on our web pages. As well as this, we organised a virtual traffic safety tour for primary school pupils at our mill localities during which we distributed tips on traffic safety, as well as reflective vests to ensure first-graders a safer trip to school.

We engage in active development cooperation with various parties such as equipment suppliers, research institutions and partner companies. Future solutions call for broad expertise, cooperation spanning different business areas, and cooperation networks involving various operators. Sustainability and the continuous improvement of our operations provide added value to society and a competitive advantage to our customers.

Read more

Proactive environmental work is part of daily work

The effects on the environment are minimised systematically at Metsä Fibre's pulp mills and sawmills. Proactive environmental work is an integral part of daily operations at Metsä Fibre's pulp mills and sawmills. Every employee contributes to decreasing environmental impact.

Systematic development to reduce water use

Water is one of the key fractions required in a pulp mill's production. Metsä Group's objective is to reduce the use of process water at its mills by 25% per product tonne from the 2018 level by 2030. To achieve this target, systematic development is underway at Metsä Fibre's mills.

Joint research seeks uses for green liquor dregs

Metsä Fibre is actively looking for new uses for the green liquor dregs that results from pulp production. The research is driven by the company's sustainability goal of making 100 per cent use of its production side streams by 2030.

Sustainability begins in the forests

At Metsä Fibre, we always know the origin of the wood we use. We obtain most of our wood raw material from forests of the approximately 100,000 owner-members of our parent company, Metsäliitto Cooperative. Forests are managed so that the trees' growth and regeneration are ensured.

Energy from pulp mills to the nation

In addition to pulp and other bioproducts, Metsä Fibre's pulp mills produce a significant amount of renewable energy. Surplus electricity from the mills is enough for 70,000 electrically heated detached houses.

Steadily better energy efficiency is a shared goal

The pulp mills of Metsä Fibre are already in energy surplus, generating more energy than they consume. But there's always room for improvement, meaning even higher energy efficiency. Shared goals and operating methods are the key to success.

PERSONNEL

Our operations aim for sustainable excellence. Its achievement requires first-rate safety at work and our goal is indeed zero accidents in all our locations. At Metsä Fibre, safety is part of our professional skills, and proactive safety work is part of our everyday operations. We invest in the continuous development of our employees' professional skills through both on-the-job learning and training, and we offer summer jobs to dozens of young people as well as apprenticeship training for several people every year.

Metsä Fibre employs 1,384 professionals. We are also a significant employer indirectly, as each job in the Finnish forest industry indirectly creates three other jobs.

Metsä Fibre is a leading producer of bioproducts and bioenergy. We produce pulp and other bioproducts as well as bioenergy at four mills in Finland. We produce sawn timber products at five sawmills in Finland and one sawmill in Russia.

Joutseno pulp mill
- 135 employees
- Capacity 690,000 t bleached softwood pulp
- Wood consumption 3,250,000 m³
- Share of certified wood 89%
- Electricity self-sufficiency 93%

Kyrö sawmill
- 74 employees
- Capacity 230,000 m³ pine sawn timber
- Wood consumption 449,000 m³
- Share of certified wood 97%

Renko sawmill
- 77 employees
- Capacity 320,000 m³ spruce sawn timber
- Wood consumption 583,000 m³
- Share of certified wood 91%

Kemi pulp mill
- 175 employees
- Capacity 620,000 t bleached softwood and hardwood pulp
- Wood consumption 3,008,000 m³
- Share of certified wood 95%
- Electricity self-sufficiency 140%

Lappeenranta sawmill
- 69 employees
- Capacity 250,000 m³ pine sawn timber
- Wood consumption 448,000 m³
- Share of certified wood 93%

Vilppula sawmill
- 101 employees
- Capacity 535,000 m³ spruce sawn timber
- Wood consumption 1,037,000 m³
- Share of certified wood 91%

Rauma pulp mill
- 122 employees
- Capacity 650,000 t bleached softwood pulp
- Wood consumption 3,262,000 m³
- Share of certified wood 83%
- Electricity self-sufficiency 150%

Merikarvia sawmill
- 74 employees
- Capacity 220,000 m³ pine sawn timber
- Wood consumption 420,000 m³
- Share of certified wood 94%

Metsä Svir sawmill
- 115 employees
- Capacity 285,000 m³ spruce sawn timber
- Wood consumption 604,000 m³
- Share of certified wood 62%

Äänekoski bioproduct mill
- 190 employees
- Capacity 1.3 million t bleached softwood and hardwood pulp
- Wood consumption 5,887,000 m³
- Share of certified wood 93%
- Electricity self-sufficiency 193%

Safety and wellbeing at work

Occupational safety

Safety is our top priority in everything we do, and everyone at Metsä Fibre has the right to a safe workplace. Our goal is zero accidents and we want to make sure that every Metsä Fibre employee and every employee of our partners heads home healthy. Safety is part of our professional skills.

Key aspects of safety management include proactive safety work, risk identification and assessment, addressing unsafe working methods, and the entire personnel's commitment. Examples of daily proactive safety work include regular toolbox meetings and safety inspections at our mills and sawmills, as well as actively implemented safety observations. We report and investigate all accidents at work and also share the lessons learned from the inspections with our other mills in order to avoid similar accidents in the future.

We engage in long-term efforts to improve safety at work and require occupational safety skills from our suppliers and partners as well. We familiarise each of our employees and partner companies working in our mills with safe working methods, and working in the mill area requires a safety orientation.

Wellbeing at work

Continuous improvement. This creates opportunities to increase skills and find new strengths. As an employer, we are guided by a number of policies and our Code of Conduct, and we require every Metsä Fibre employee to comply with it.

For us, excellent management is inspiring, goal-oriented, demanding and fair. Everyone has a right to an annual performance and development appraisal. We support employee development by providing on-the-job learning, training courses and work cycles.

Promoting and maintaining wellbeing at work and working capacity is based on proactive action. We have at our disposal early support, work capacity assessments and a model with a personal work capacity plan.

In 2021, we conducted a personnel survey measuring the work community's readiness to implement the company strategy and identifying the key development areas. Based on a regular personnel survey, development measures are set for identified development areas, and we systematically monitor the implementation of these.

Sustainable and responsible business culture

In 2020, Metsä Group carried out a large-scale ethics barometer survey with the aim of investigating how personnel feel that the company's Code of Conduct is implemented in practice.

Sustainable business culture, which the ethics barometer measures, is one of Metsä Group's strategic sustainability goals for 2030. The target set for the ethical index resulting from use of the barometer is 100% by 2030. The result of the first survey was 83.5 per cent for Metsä Fibre. In the future, the ethics barometer will be carried out every second year in connection with the work community functionality study.

LTA1 Lost-time accident frequency rate	2021	2020	2019	2018	2017
Sawmills	7.5	10.3	14.8	7.2	
Pulp mills	9.2	4.8	4.7	5.9	
Metsä Fibre total	7.6	**6.6**	**8.7**	**5.9**	**5.2**

	2021	2020	2019	2018	2017
TRIF total recordable incident frequency per million worked hours	10.2	8.4	20.2	17.1	17.2
Sickness absenteeism % of theoretical working time	4	3.7	4.1	3.7	3.7
Work accident absenteeism % of theoretical working time	0.2	0.2	0.2	0.1	0.2

People in Metsä Fibre

We at Metsä Fibre are proud of our heritage and strong industry expertise. We work in the forefront of the forest industry and focus on developing sustainable solutions for the future. We work together to implement Metsä Fibre strategy for sustainable excellence.

The high quality of our products is based on the extensive expertise of our employees. We invest in the continuous development of our employees' professional skills through both on-the-job learning and training. Each one of us is focused on developing, producing and delivering products and services that meet our customers' needs. We aim for a strong, innovative culture with a winning attitude, and we do it all while paying close attention to safety, responsibility and sustainability.

Our work is guided by our values: reliability, cooperation, responsible profitability and renewal. We develop our operations in cooperation with our stakeholders.

Personnel 31 December 2021	Share of permanent employees	Share of full-time employees	Average age	Average years served	Recruitments	Male/female ratio of all personnel
1,384 persons	88 %	97 %	43.7 years	14.8 years	115 persons	84/16 %

Male/female ratio among supervisors	Male/female ratio in the company's management team	Ethics barometer result 2020*	Personnel survey result 2021	Code of Conduct performance	Average training hours per employee
81/19 %	75/25 %	83.5	72.4	99 % of employees	23.2 hours

*) The ethics barometer is carried out every second year with the personnel survey.

Read more

Safety agents supporting maintenance shutdowns

Metsä Fibre's safety agents work every year to ensure safe annual maintenance shutdowns. It is also a way to learn, network and get to know other mills.

Expert on Nordic wood

Product Manager for sawn timber, **Niko Öhman**, knows the possibilities of Finnish spruce and pine. Through cooperation wood finds its uses. His position is at the Kyrö sawmill in Finland, but the results of his work can be seen everywhere in the world.

Safety involves everyone

Proactive safety work ensures a safe work environment at the Rauma sawmill construction site. Safety work helps ensure that everyone knows how to work safely on site.

Almost anything can be made from pulp

Metsä Fibre's Product Development Director **Raili Koponen** has worked for Metsä Group for more than three decades. Pulp became her field of expertise by chance, but the work turned out to be so interesting that she became absorbed by it.

Long career with pulp

Jukka Kiuru works as a project manager for the Kemi bioproduct mill project. He first joined Metsä Fibre in 1999, and has worked in a number of large-scale mill projects.

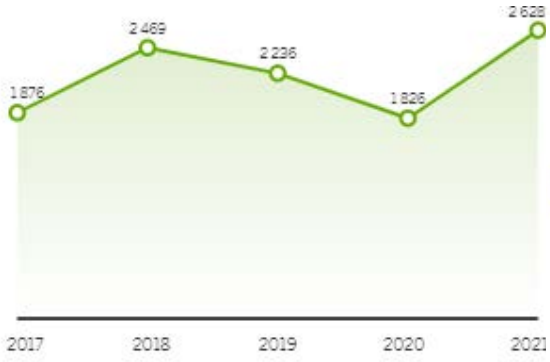
Working at the sawmill

Production Engineer **Victoria Eklund** truly enjoys working at the Renko sawmill. The workplace atmosphere is open and honest, and the range of duties of a Production Engineer is wide.

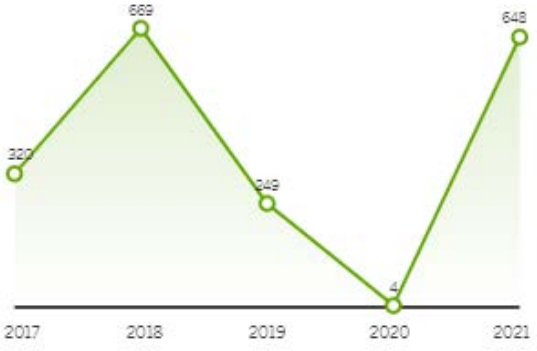
Five-year trend of key indicators

Finance

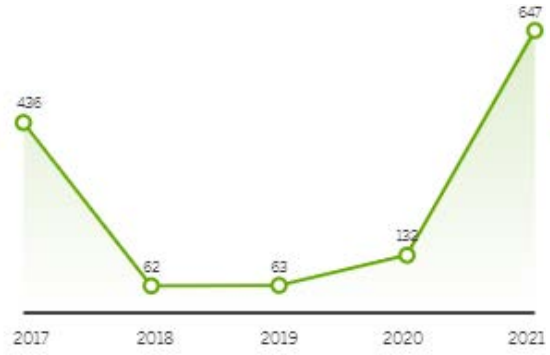
Sales (EUR million)



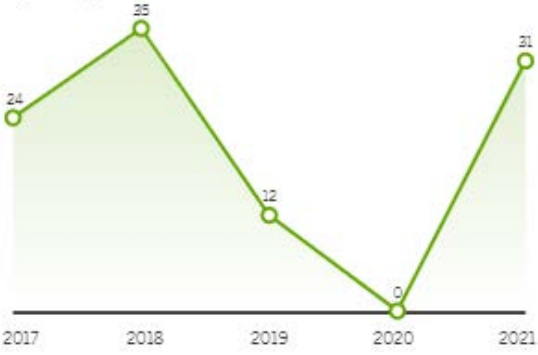
Comparable operating result (EUR million)



Investments (EUR million)

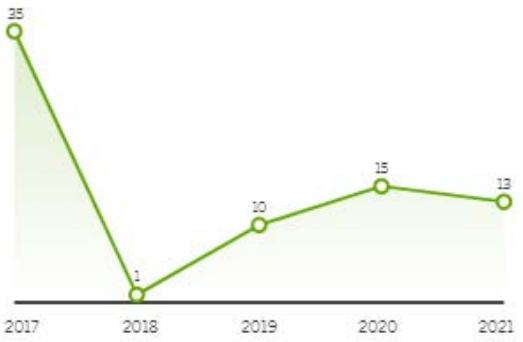


Return on capital employed (%)



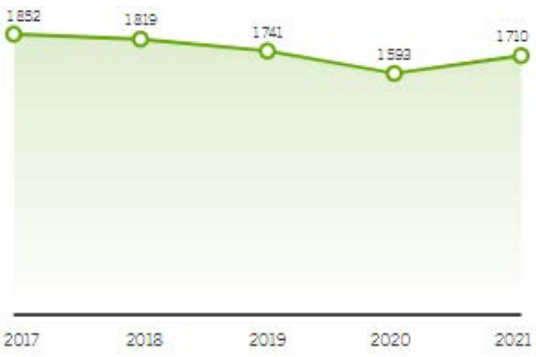
Equity ratio (%)

Net gearing ratio %



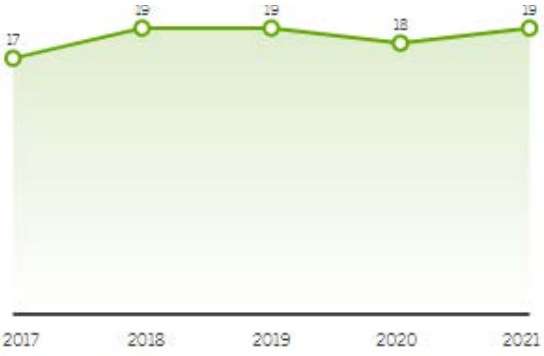
Pulp production (1,000 tonne)

Sawn timber production (1,000 m³)

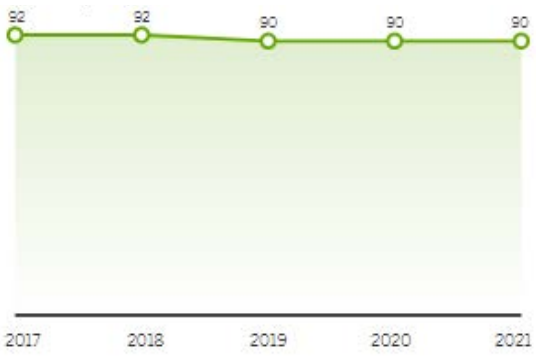


Sustainability

Total wood consumption (million m³)

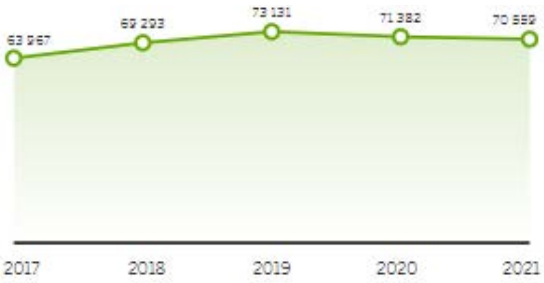


Share of certified wood (%)

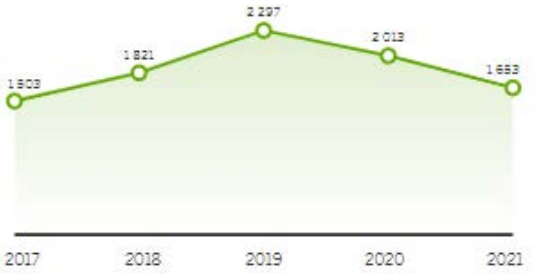


Emissions into water

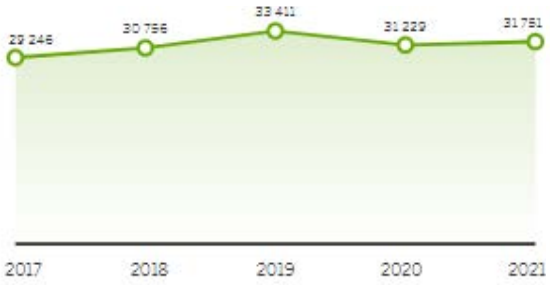
Process water volume (1,000 m³)



Total suspended solids (t)

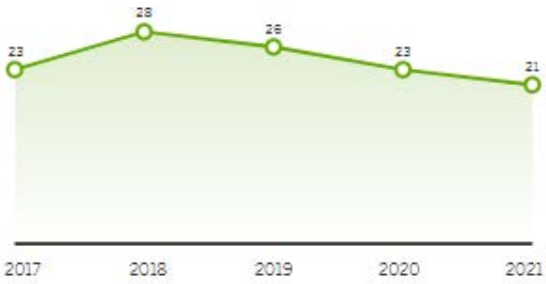


Chemical oxygen demand COD (t)

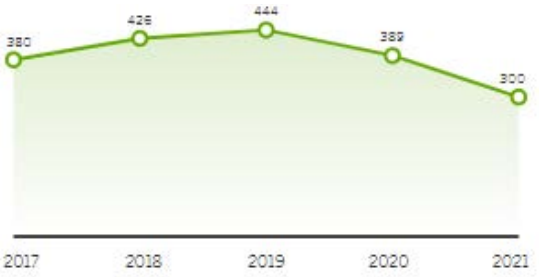


Biological oxygen demand BOD (t)

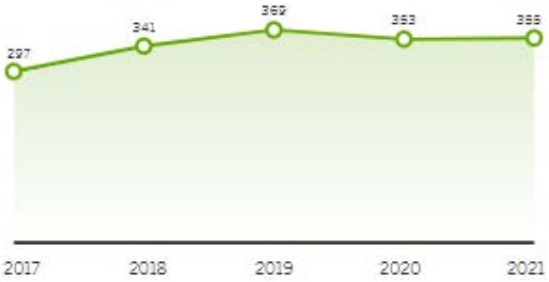
Phosphorus P (t)



Nitrogen N (t)



AOX (t)



Emissions into air

Sulphur dioxide SO_2 (t)

NO_x NO_2 (t)

CO_2 from fossil sources (1,000 t)

CO_2 from biomass (1,000 t)

Particles (t)

TRS S (t)

Waste

Landfill waste (t)

Hazardous waste (t)

Energy

Wood based fuel use (GWh)

Fossil fuel use (GWh)

Purchased electricity (GWh)

Purchased heat (GWh)

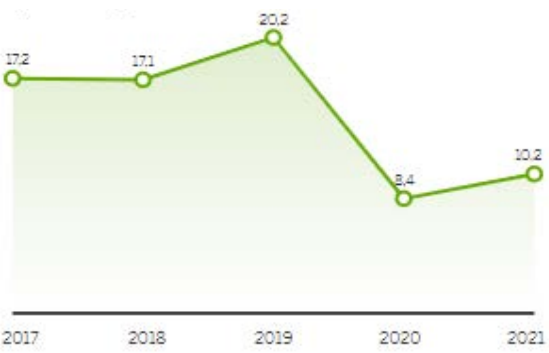
Personnel

LTA1

Lost-time accident frequency rate

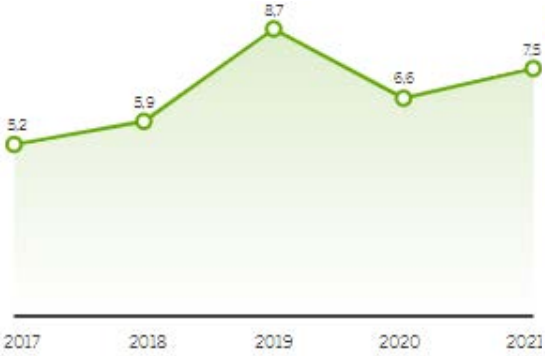
TRIF

Total recordable incident frequency per million worked hours



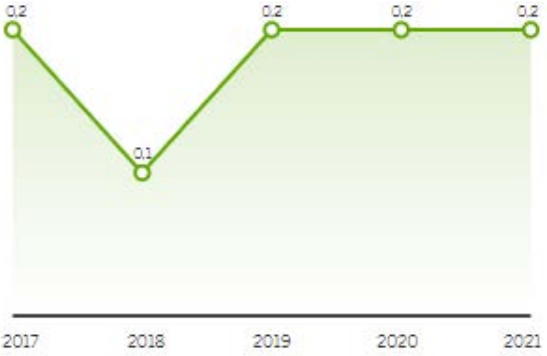
Sickness absenteeism

(% of theoretical working time)



Work accident absenteeism

(% of theoretical working time)



Glossary

AOX
AOX derives from chlorine dioxide bleaching and it describes the organic chlorine compounds bound to biological compounds.

Biological oxygen demand BOD
The volume of oxygen consumed by the degradation of wastewater in the waterways. The BOD figure provides an idea of how much wastewaters contain easily degradable biological materials.

Chemical oxygen demand COD
A value used to monitor the quality of treated wastewater and its organic load on waterways. The COD describes the combined volume of both quickly and slowly degradable biological materials in the wastewater.

CO_2 biofuel
Carbon dioxide emissions are produced during the combustion of biofuels, such as wood-based fuels.

CO_2 fossil-based
Fossil-based carbon dioxide emissions are produced during the combustion of fossil fuels, such as heavy fuel oil.

Nitrogen (N)
The nutrient inputs of waterways, which have an impact on their eutrophication.

NO_x NO_2
Nitrogen oxides produced during combustion which have an impact on air quality.

Particles
Combustion-derived particles which have an impact on air quality.

Phosphorus P
The nutrient inputs of waterways, which have an impact on their eutrophication.

Sulphur dioxide SO_2
Compounds produced during combustion which have an impact on air quality.

TRS S
Reduced sulphur compounds generated in pulp production which may cause odour nuisance during a disturbance. In a normal situation, the compounds are recovered and treated.

Metsä

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