

Äänekoski bioproduct mill



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A modern bioproduct mill in Äänekoski



The next-generation bioproduct mill of Metsä Fibre, part of Metsä Group, produces a diverse range of bioproducts for growing markets.

A MODERN MILL CONCEPT

The Äänekoski mill is called a bioproduct mill, because it manufactures many other bioproducts besides pulp, produces significantly more bioelectricity than a traditional pulp mill, and does not use any fossil fuels in pulp production. It makes resource efficient use of its wood raw material and production side streams.

As its main product, the bioproduct mill produces 1.3 million tonnes of softwood and birch pulp annually under the Metsä brand, which serves as raw material for paperboard, tissue, greaseproof and printing papers, as well as speciality products. Most of the pulp is sold to other countries, mainly in Europe and Asia.

The demand for softwood pulp is increasing steadily around the world, most rapidly in China. The bioproduct mill has strengthened Metsä Group's global position in the market for Nordic softwood pulp, and will improve long-term profitability and help meet the increasing demand for Nordic softwood pulp.

FRONTRUNNER OF THE BIOECONOMY

Metsä Group is a forerunner in responsible bioeconomy, utilising renewable wood from sustainably managed Nordic forests. We focus on wood supply and forest services, wood products, pulp, fresh fibre paperboards, and tissue and greaseproof papers. Metsäliitto Cooperative is the parent company of Metsä Group and is owned by approximately 100,000 Finnish forest owners.

Metsä Fibre is a leading producer of bioproducts, biochemicals and bioenergy. Metsä Fibre is the world's largest producer of market pulp and a significant operator in sawn timber production.

Read more

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Operations based on sustainability

Featuring renewable wood as their main raw material, Metsä Group's products replace fossil raw materials. Sustainability and responsibility are an integral part of everything we do – from the forest all the way to our products.

We use renewable Nordic wood from sustainably managed forests as our raw material, employ the best available technologies in production, and take care of our employees' safety and wellbeing.

Our products are safe and recyclable. We make resource efficient use of raw materials, water and energy, and produce renewable energy and various bioproducts from side streams.



CERTIFIED, TRACEABLE WOOD

The Nordic wood used by Metsä Fibre is procured from sustainably managed forests in areas where the forests grow more than they are used.

The Äänekoski bioproduct mill uses 6.5 million cubic metres of pulpwood annually, most of which is procured in Finland. In its production, the mill also uses chips, which are a by-product from the sawmills. Softwood accounts for 4.5 million cubic metres and hardwood for 2 million cubic metres of the total.

We know the origin of wood we use and 90 per cent of it is certified.

Read more

[Sustainability in Metsä Fibre](#) →

[Bioproduct mill concept](#) →

OUR UNIQUE BIOPRODUCT MILL CONCEPT

Metsä Fibre's bioproduct mill concept combines efficient raw material use with energy and environmental efficiency.

The bioproduct mill concept makes it possible to convert pulp production side streams into valuable biochemicals, bioenergy and other bioproducts that can be used to replace fossil-based materials and fuels.

The bioproduct mill generates considerably more bioelectricity than it consumes, and no fossil fuels are needed in pulp production.

The mill's business model is based on an efficient partner network, in which new products are upgraded in cooperation with various stakeholders.

Alongside the Äänekoski mill, the new bioproduct mill in Kemi is another practical example of the concept's deployment.

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FIRST-RATE ENVIRONMENTAL EFFICIENCY

The unique bioproduct mill concept developed by Metsä Fibre significantly reduces the environmental impact of pulp mills. Energy efficiency, low water consumption, and minimised emissions were key criteria when choosing equipment for the Äänekoski bioproduct mill. The mill features the best available technology.

An advanced closed cycle in which water and chemicals are recycled and returned to the process for reuse is key in the bioproduct mill's processes. For example, odorous gases are converted into sulphuric acid, which the bioproduct mill needs to manufacture tall oil, an important bioproduct. Thanks to the sulphuric acid plant, sulphate emissions into waterways can be minimised. It also reduces the need to transport chemicals on rail or by road.

DID YOU KNOW THAT in addition to using bioenergy in our own production, we transfer it as electricity to the grid and as district heat for nearby communities.



RENEWABLE ENERGY FROM SIDE STREAMS

The bioproduct mill generates 2.4 times the amount of electricity it consumes annually, and does not use any fossil fuels in its pulp production. All the energy needed by the mill is produced from production side streams.

The Äänekoski bioproduct mill has an annual electricity generation capacity of 1.8 TWh, which is equivalent to 2.5 per cent of the overall electricity production in Finland.

Read more

- [Proactive environmental work at Äänekoski](#) →
- [Metsä Fibre Annual Review: Sustainability](#) →

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Competent personnel play a key role

Our operations are based on our personnel's solid competence, of which we are very proud. The Äänekoski bioproduct mill employs top professionals in the fields of chemical forest industry, maintenance, and business support functions.

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 annually, as well as several apprenticeship positions. In our work, we pay special attention to safety at work, responsibility and sustainability.

DID YOU KNOW THAT the Äänekoski bioproduct mill employs **150 professionals of Metsä Fibre** and more than 85% of them are process personnel.



SAFETY IS THE TOP PRIORITY

Safety is part of our professional skills, and proactive safety work is part of our daily operations. In practice, proactive safety work can mean identifying and assessing risks, addressing safety deviations, and making safety observations and carrying out safety walks.

In addition to our personnel, we require our suppliers and partners to demonstrate occupational safety skills. 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.

Our work is guided by Metsä Group's values
RELIABILITY
COOPERATION
RESPONSIBLE
PROFITABILITY
RENEWAL



OPERATING MODEL BASED ON SELF-DIRECTION

The bioproduct mill has adopted an operating model based on self-direction in production. The personnel were involved in developing the model.

The shifts at the mill work in a self-directed manner, and there are no longer any shift supervisors. Supervisors now work in the daytime. The objective is shared leadership, which gives everyone an opportunity to influence their own work and the related decision making. This also enables the personnel's competence to be used efficiently.

Read more

Careers in Metsä



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More than just a pulp mill

At the heart of the bioproduct mill is the world's most efficient pulp mill, which uses wood raw material to the last chip. Pulp production side streams are utilised efficiently in the production of other bioproducts and bioenergy.

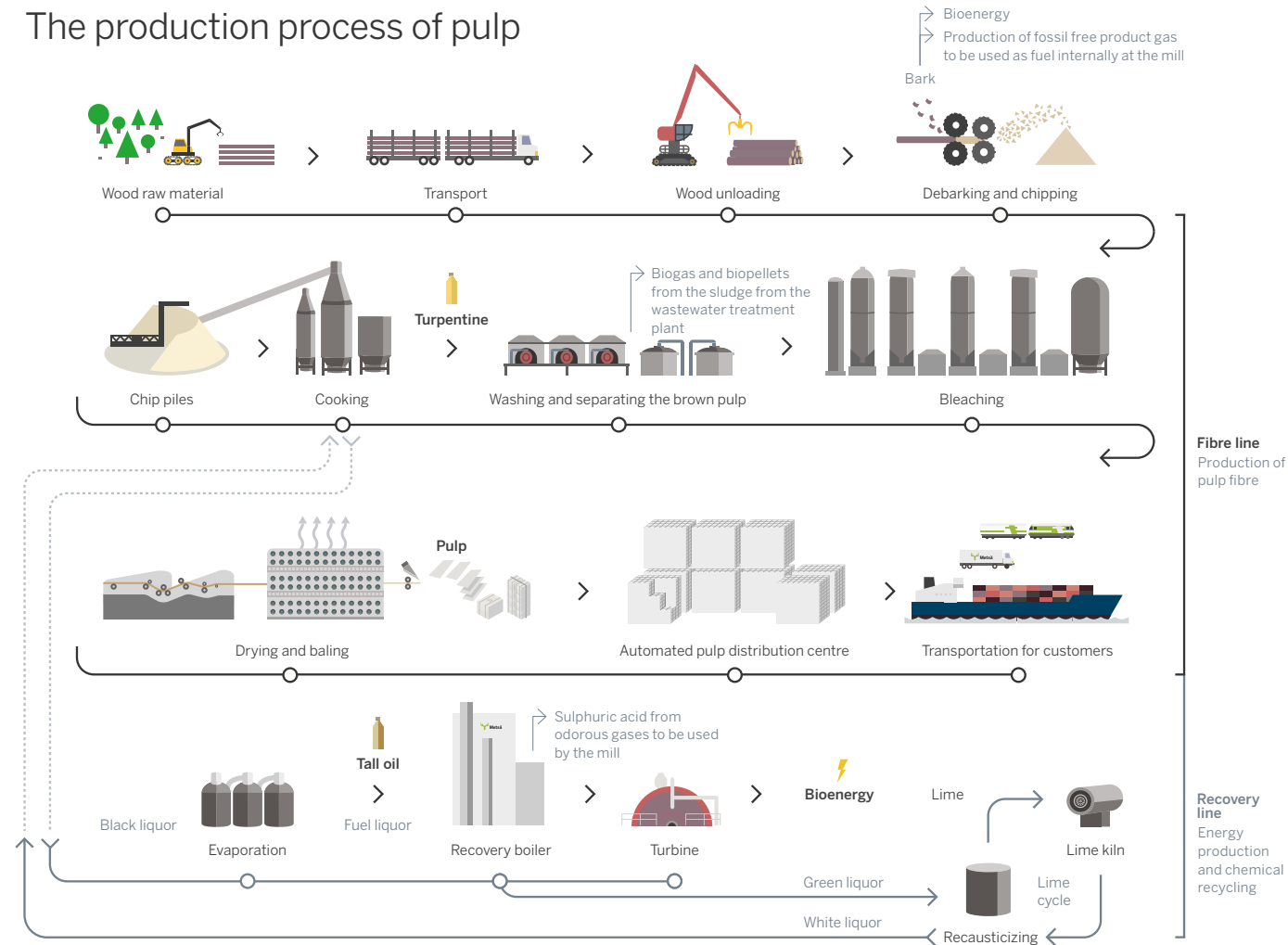
FOSSIL FREE MILL

A significant share of all the renewable energy produced in Finland is generated in pulp production, when black liquor, consisting of wood and cooking chemicals, is combusted. This process converts the cooking chemicals into a reusable form.

The Äänekoski bioproduct mill generates 2.4 times the amount of electricity it consumes. The bioproduct mill will not use any fossil fuels, because it generates all the energy it needs from production side streams. The fossil fuel for the lime kiln has been replaced with product gas derived from bark. The tall oil pitch generated during the further processing of tall oil can be used as reserve fuel in the mill's shutdowns and start-ups.

The machines used in wood processing and pulp loading are driven by electricity. Export pulp is transported from Äänekoski to Vuosaari Harbour along an electrified rail network.

The production process of pulp



MODERN SOLUTIONS

The automated pulp distribution centre is one example of the modern solutions introduced at the Äänekoski bioproduct mill. The world's first automated distribution centre improves the quality and punctuality of pulp deliveries, as well as safety at work. The mill's sulphuric acid plant is also the first of its kind worldwide.

Not only does the bioproduct mill feature state-of-the-art equipment solutions; its devices are also connected more comprehensively to condition monitoring. While the processes are running, data can be collected and analysed to anticipate any disturbance, and perform maintenance work accurately and on time. Preventive maintenance helps ensure that the mill operates efficiently and safely, and offers good environmental performance.

DID YOU KNOW THAT the fossil free bioproduct mill produces **all the energy it needs** from production side streams.

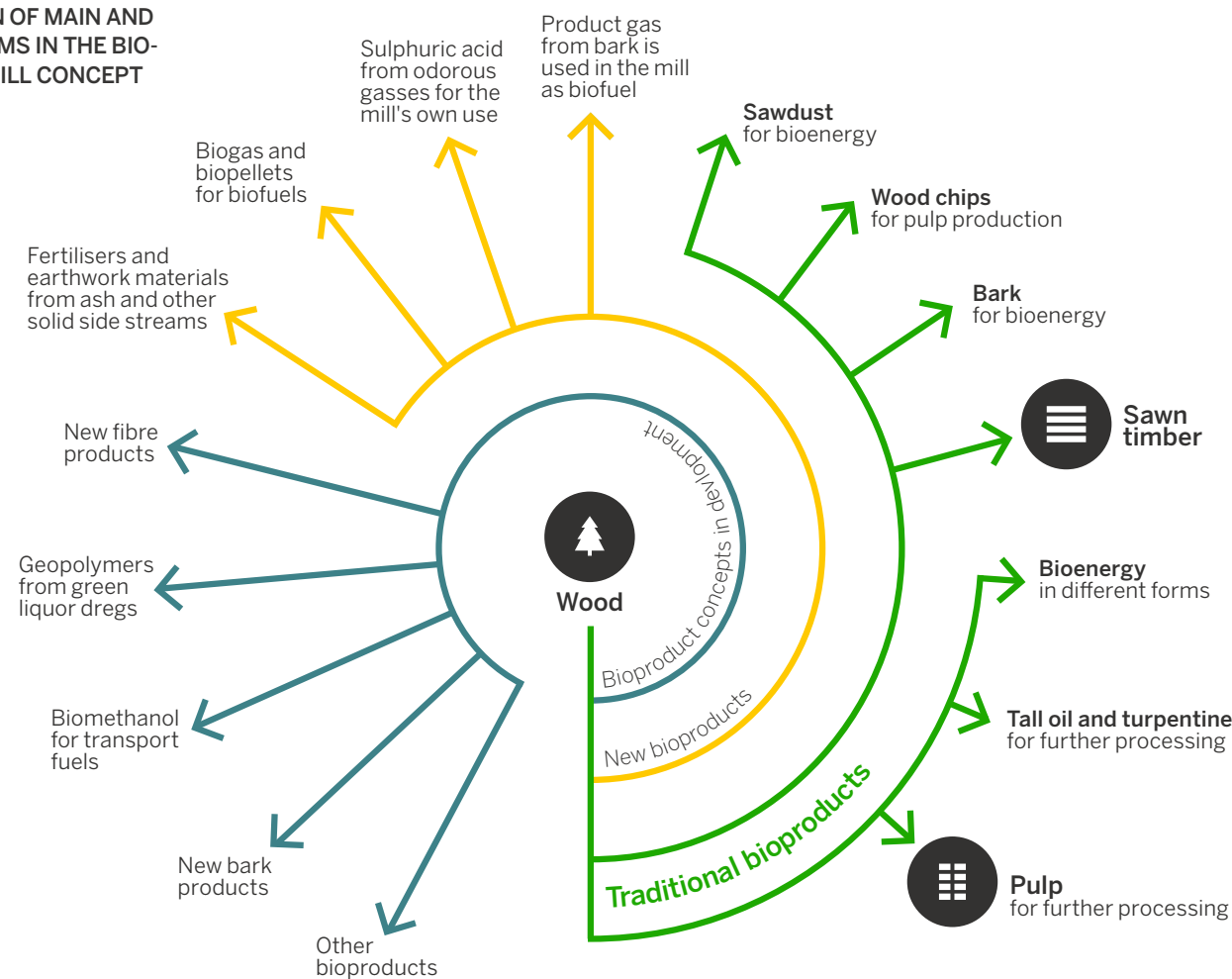
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New bioproducts expand the product range

UTILISATION OF MAIN AND SIDE STREAMS IN THE BIOPRODUCT MILL CONCEPT



One of the central ideas behind the bioproduct mill is to expand the product range to entirely new bioproducts.

In addition to softwood and birch pulp, the mill produces bioenergy and traditional biochemicals such as tall oil and turpentine. New bioproducts produced at the mill include product gas, sulphuric acid, biogas and biopellets. Most of the solid side streams from production find a useful purpose as well. Metsä Group's goal is to fully utilise production side streams by 2030 and not generate any landfill waste.

DID YOU KNOW THAT we aim to make full use of production side streams by **2030**.

Bioproducts manufactured from side streams account for 20 per cent of the mill's sales, and the share is growing gradually. We are investigating several consistently proceeding processes and product paths. Potential new bioproducts include pulp-based textile fibres and new fibre products. The refining of ideas and research results into commercial products calls for persistent multidisciplinary cooperation.

Watch video

Producing bioproducts in Äänekoski →

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New bioproducts

PRODUCT GAS

Bark is used to make product gas for the bioproduct mill's own needs. This is one of the solutions that enables the mill to run without any fossil fuels. The renewable product gas replaces a considerable volume of heavy fuel oil every year.

SULPHURIC ACID

The bioproduct mill's sulphuric acid plant converts odorous gases into sulphuric acid for the mill's own use. Sulphuric acid is required in the production of tall oil, for example. The sulphuric acid plant further strengthens the mill's chemicals cycle and reduces the need for transporting chemicals.

BIOPELLETS AND BIOGAS

The mill's biogas plant produces biopellets and biogas from the wood-based wastewater sludge generated in the process. Biopellets can be used in power plants and biogas as transport fuel, for example.

WOOD-BASED TEXTILE FIBRE

The Äänekoski demo plant of the joint venture between Metsä Spring and Itochu produces wood-based textile fibre from the bioproduct mill's undried pulp. The ecological production of wood-based textile fibres relying on ionic liquids is a long-term development project. The goal is to offer an alternative method for producing textile fibre that places less burden on the environment.

A 3D FIBRE PRODUCT

The demo plant built in Äänekoski by Metsä Spring and Valmet produces ready-to-use 3D fibre products from wet wood-fibre pulp without intermediate phases. The goal is to develop a new kind of wood-based 3D fibre product that can replace packaging made from fossil-based raw materials.

BIOMETHANOL

Metsä Fibre and Veolia have signed a long-term partnership on the refining of crude methanol generated in pulp production at the Äänekoski bioproduct mill into commercial biomethanol. As part of the cooperation, Veolia is building a crude methanol refinery in connection with Äänekoski bioproduct mill. Biomethanol production adds value to methanol, and the resulting product can be used as traffic fuel, for example.



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A unique bioeconomy ecosystem



Continuous improvement is the cornerstone of our operations, and we develop our products and operations in accordance with this principle. Cooperation with different parties is also important.

BIOPRODUCTS ARE AN ANSWER TO GLOBAL MEGATRENDS

The bioproduct mill's business model is based on efficient partnerships. The surrounding network of companies produces various bioproducts from pulp or the side streams of pulp production. Our partner network plays an important role in our efforts to use raw material and side streams in the best possible way. As a bioeconomy ecosystem, Äänekoski is globally unique

DID YOU KNOW THAT
the bioproduct mill's
employment impact on its
direct value chain in Finland
is **more than 2,500 jobs.**

The business ecosystem creates jobs and increases the supply to the growing market for wood-based bioproducts. Renewable wood raw material and innovative solutions offer answers to future global challenges, such as climate change, population growth and resource efficiency.

Future innovations will increasingly emerge from cooperation between different partners such as higher education and research institutions, and companies in various fields. The bioproduct mill enables the ecosystem's future expansion and development.

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Broad partner network around
Äänekoski bioproduct mill



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Metsä Wood
Plywood

Metsä Group's Pro Nemus
visitor centre

Metsä Spring's and Itochu's textile fibre demo plant
Wood-based textile fibres from pulp

Specialty Minerals Nordic
PCC (precipitated calcium carbonate) made of the carbon dioxide from the bioproduct mill's flue gases is used as a filler and coating agent in the paper and paperboard industry

Metsä Board
Folding boxboard from pulp for consumer goods packaging

Metsä Board Excellence Centre
Research and development facilities, packaging design studio, customer feedback centre and lab

Metsä Fibre bioproduct mill

Metsä Spring's and Valmet's 3D fibre product demo plant
3D fibre products from pulp for food packaging

Nouryon
CMC (carboxymethyl cellulose) made from pulp, used as a binding, coating and stabilising agent in foodstuffs, pharmaceuticals and industrial purposes

Metsä Forest
Wood supply and deliveries

Metsä Wood
Birch veneer

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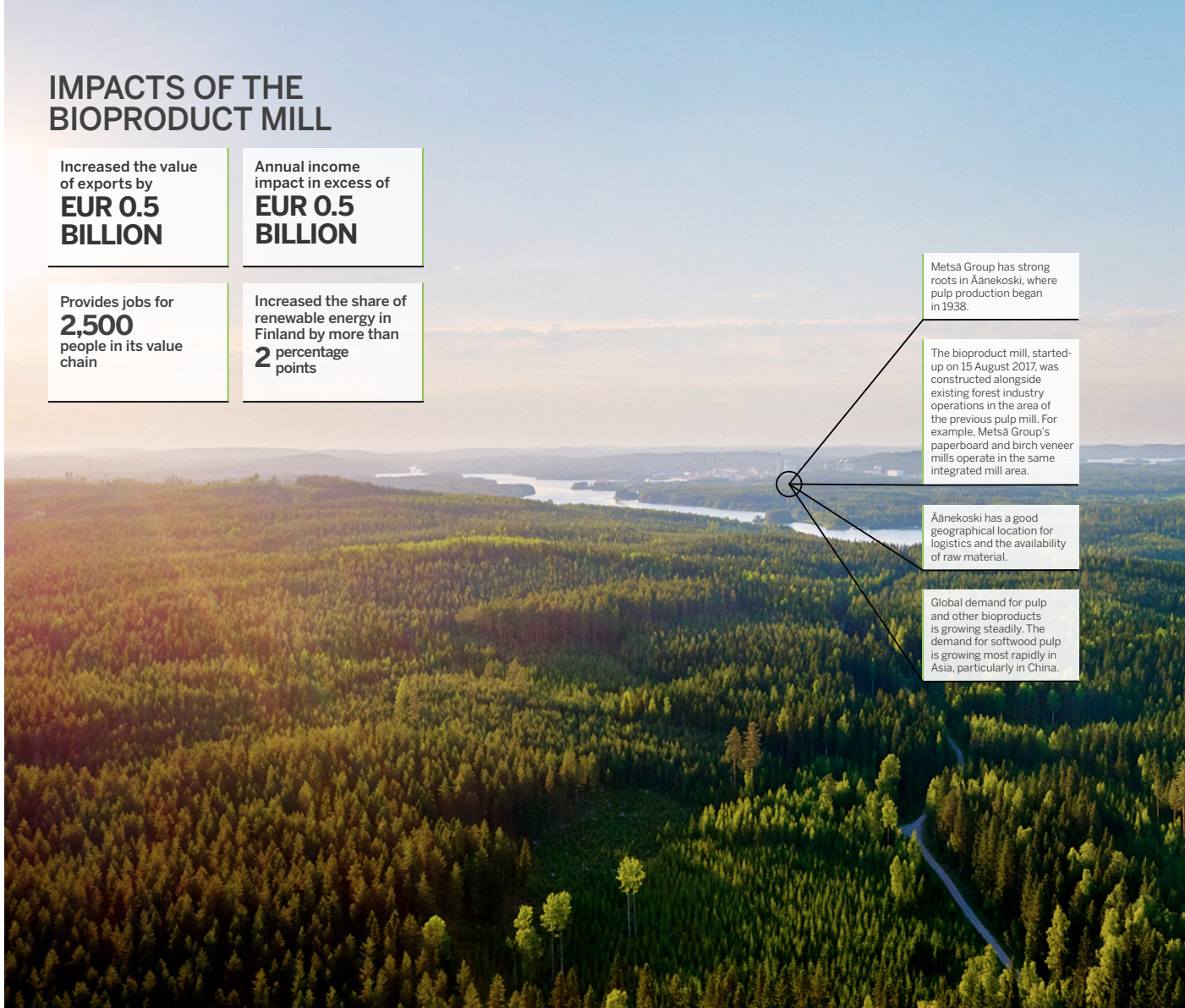
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Growth for Finland



IMPACTS OF THE BIOPRODUCT MILL

Increased the value of exports by EUR 0.5 BILLION	Annual income impact in excess of EUR 0.5 BILLION
Provides jobs for 2,500 people in its value chain	Increased the share of renewable energy in Finland by more than 2 percentage points

Metsä Group has strong roots in Äänekoski, where pulp production began in 1938.

The bioproduct mill, started-up on 15 August 2017, was constructed alongside existing forest industry operations in the area of the previous pulp mill. For example, Metsä Group's paperboard and birch veneer mills operate in the same integrated mill area.

Äänekoski has a good geographical location for logistics and the availability of raw material.

Global demand for pulp and other bioproducts is growing steadily. The demand for softwood pulp is growing most rapidly in Asia, particularly in China.

The bioproduct mill has a significant impact on the Finnish national economy by generating new jobs and economic growth.

The bioproduct mill's employment impact on its direct value chain in Finland is roughly 2,500 jobs. To date, the employment impact has been most significant in the forest industry and transportation.

The mill area is also an important local employer: in addition to the mill's own personnel, many maintenance employees, service providers and personnel from partner companies work in the area. The mill will secure jobs far into the future.

The mill has increased the value of exports by EUR 0.5 billion per year. Moreover, it has an annual income impact of more than EUR 0.5 billion in Finland. Novel products and the bioeconomy and circular economy will generate new value in the forest sector.

The bioproduct mill is an important producer of renewable energy nationally. It has increased the share of renewable energy in Finland by more than two percentage points.

DID YOU KNOW THAT you can follow activities in the Äänekoski mill area live through our web cameras

Read more

Contributing to local livelihoods and society →

Livestream

Webcams of Äänekoski →



**Exceeding
expectations.**

 @MetsaFibre

 Metsä Fibre

METSÄ FIBRE

Äänekoski bioproduct mill
P.O. Box 1000
44101 Äänekoski

Visiting address
Sarvelantie 1,
44100 Äänekoski

www.metsafibre.com

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