Metsä Group

Climate transition plan 2024

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Climate work at the core of our strategy and operations

CLIMATE CHANGE is one of the greatest challenges of our time. Reducing the use of fossil-based raw materials is an absolute necessity for us to get anywhere near the goals of international climate commitments. Decoupling the increasing use of materials and the interdependence of economies is another challenging task in which humanity must succeed. The downward trend in the global population, projected to begin towards the end of the century, will come too late for the climate. Overconsumption must be reduced earlier, and societies' resource efficiency must be made the guiding principle.

Forests offer several solutions to climate change mitigation. The production of wood raw material in both natural forests and plantations contributes to reducing the use of fossil resources. In forestry, we must find a balance between profitable commercial forest use, climate change mitigation actions and measures promoting biodiversity. A healthy growing forest can act as a carbon sink, in which the amount of carbon stored in a growing tree increases while the forest serves as a resource-efficient source of renewable raw material for products that people around the world can utilize in their daily lives. Old forests, which have largely stopped growing, do not have a sink effect, and such forests offer uncertain carbon storage in terms of plant diseases, storms or forest fires. In the boreal coniferous forest zone, this risk is realised across millions of hectares in countries where sustainable forestry is not practised. However, old forests have significant value in securing biodiversity.

Metsä Group's key objective is to create value for the forest assets of Metsäliitto Cooperative's owner-members and to develop its business in accordance with economic, social and ecological sustainability. Long-term climate work is at the core of our business strategy and everything we do, and we support the EU goal of achieving climate neutrality by 2050.

Developing regenerative forestry and resource-efficient production

Building resilience in a changing climate requires a strategic approach that links climate and nature. Metsä Group has defined that the purpose of its business is to promote the bioeconomy and circular economy by sustainably and efficiently upgrading northern wood into first-class products. Our main businesses currently include wood supply and forest management services, wood products, pulp, sawn timber, paperboard, and tissue and greaseproof papers. We also develop new applications for wood fibre and production side streams. For example, we are exploring possibilities to construct a wood-based carbon capture plant at one of our bioproduct mills. Bio-based CO_2 is an important raw material in the hydrogen economy's products, and it can replace fossil-based carbon sources in the production of liquid fuels and various chemicals and plastics, for example.

Metsa Group's Climate transition plan provides a holistic view of our climate targets and work, covering both strategic and operational aspects. All the E, S and G themes and targets related to our sustainability work are described and reported in our annual review.

Finnish commercial forests are semi-natural, which means that wood production is based on native tree species and integrated into the natural ecosystem, which also produces numerous other ecosystem services such as nutrient cycling, water purification, pollination, climate regulation and recreation. In the spring of 2023, Metsä Group committed to the principles of regenerative forestry. Our goal is to verifiably improve the state of Finnish forest nature in our owner-members' forests by 2030. Strengthening biodiversity has many positive impacts on forest health, including a greater ability to adapt to climate change. Our owner-members' total forest assets amount to approximately 5.5 million hectares, which is more than half of all the private forests in Finland. Our actions to improve forests' climate resilience thus have a significant impact.

Ilkka Hämälä

President and CEO

This is Metsä Group

Metsä Group is an international forest industry Group based in Finland. Its parent company Metsäliitto is a cooperative with over 90,000 members who own forest in Finland. Metsä Group procures wood raw material mainly from the cooperative's owner members, which creates long-term insight and stability over generations. In 2023, Metsä Group committed to the principles of regenerative forestry: the aim is to verifiably improve the state of Finnish forest nature by 2030 together with the forest owners.

Promoting the bioeconomy and circular economy is at the core of Metsä Group's strategy and operations. Five business areas and the innovation company Metsä Spring form a united group which focuses on wood supply and forest management services, wood products, sawn timber, pulp, paperboard and tissue and greaseproof papers. The projects related to new products furthest along are textile fibre and moulded fibre-based packaging, developed in demo plants.

Metsä Group has set strategic sustainable development 2030 targets, many of which are related to climate change.

37 production units in 7 European countries

Sales:
70.5% EMEA
12.5% America
17.0% APAC

Target
100% fossil-free mills by 2030

Commitment to the principles of **regenerative forestry**

METSÄ GROUP

The parent company Metsäliitto is a cooperative with over 90,000 members who own forest in Finland.

Sales **5.7** billion

Personnel **9,600**

Wood supply and forest services	Wood products	Pulp and sawn timber	Paperboard	Tissue and grease-proof papers
METSÄ FOREST	**METSÄ WOOD**	**METSÄ FIBRE**	**METSÄ BOARD**	**METSÄ TISSUE**
Metsäliitto Cooperative owns 100%	Metsäliitto Cooperative owns 100%	Metsäliitto Cooperative owns 50.1% Metsä Board 24.9% Itochu Corporation 25.0%	Metsäliitto Cooperative owns 52% (69% of votes) The company is listed on Nasdaq Helsinki	Metsäliitto Cooperative owns 100%

METSÄ SPRING Innovation company

CDP has recognised Metsä Board with a triple 'A' score for leadership on climate change, forests and water security. (status Q1/ 2025)
In the **EcoVadis** ranking Metsä Board, Metsä Fibre and Metsä Tissue scored the highest recognition level, "Platinum". (status in Q4/2024)

Metsä Group's Climate transition plan towards 2030

Climate transition plan presents our strategic ambition and governance on climate matters, as well as our climate actions related to forest services, production, products and the value chain.

Key 2030 targets

- 2030 Emission reduction targets
  - Zero tonnes of fossil Scopes 1 and 2 CO_2 emissions
  - 30%/tkm reduction in greenhouse gas emissions from logistics purchased by Metsä Group from the 2022 level (Scope 3, category 4)
- Other climate related strategic 2030 targets

Key advocacy areas

- Advancing regenerative forestry
- Identifying and harnessing the climate benefits of renewable carbon and related products
- Developing regenerative land use
- Accelerating the circular bioeconomy

Operating areas

1. Building of climate resilience as a strategic foundation

Promoting sustainable development is a key crosscutting theme in Metsä Group's strategy. Building resilience in a changing climate requires a strategic approach that links climate and nature.

Climate risk analysis as a basis for resilience analysis

Metsä Group's climate risks were assessed in a climate risk analysis conducted in 2024 that covered physical risks, transition risks, and opportunities in the Group's own operations and value chain. The assessment of impacts, risks and opportunities was extended from previous years to cover the sub-topics and sub-sub-topics of the European Sustainability Reporting Standards. Internal climate risk workshops were attended by experts and management from Metsä Group's business areas and operations, and the material used in them includedtwo climate scenarios (RCP 1.9 and RCP 8.5) adopted by the Intergovernmental Panel on Climate Change (IPCC), reports from the Finnish Meteorological Institute and scientific articles. RCP 1.9 limits the increase in global mean temperature to 1.5 °C, and in RCP 8.5, emissions continue to increase at the current rate and the global mean temperature increases by 4.3 °C by 2100. The analysis comprised a short-term (less than one year), mid-term (1–5 years) and long-term (more than 5 years) review. In the assessment of transition risks, Metsä Group's ongoing advocacy work and the related analysis of the operating environment played a key role.

Location of production units supports competitiveness in a changing climate

The physical climate risks of Metsä Group's production units and key supply chain locations were analysed by an external partner in 2024. The results did not indicate any significant risks related to Metsä Group's production units. This suggests that the location of production units supports the Group's competitiveness in a changing climate. In addition to the present, the analysis included the years 2030 and 2040 and was carried out with geolocation-based modelling for several different climate scenarios.

According to projections, Finnish forests will have to deal with a temperature increase of several degrees during their life-cycle due to climate change. Adapting to climate change requires adapting to both acute threats such as extreme weather phenomena and chronic threats caused by the impact of climate change on water availability, tree harvesting conditions, growth conditions of different tree species, and storm, drought, forest fire, insect, and fungal damage in forests, for example.

Key climate transition risks

Type	Description of risk/opportunity	Impact analysis in climate scenarios IPCC 1.5 °C and 4.3 °C	Key management activities
Policy and regulation	• **Risk:** The availability of wood raw material decreases due to regulatory requirements. The ambiguity and partial inconsistency of regulation increases the risk level. • **Risk:** Nature and carbon compensation schemes justify the continued use of fossil-based raw materials and undermine the market for forest-based products. However, these schemes can provide opportunities for improving forest health, biodiversity and growth. • **Risk:** Changes in legislative environmental targets significantly increase material and logistics costs. Yet these targets can motivate our logistics partners to engage in climate work, which reduces our Scope 3 emissions. • **Risk/ opportunity:** Future EU circular economy and product regulations affect the status of renewable raw materials and products.	• Overall, policy and regulatory risks and opportunities are greater in the 1.5 °C scenario than in the 4.3 °C scenario. However, the risk of unclear regulation is also high in the 4.3 °C scenario. • Conflicting or overlapping EU regulatory requirements related to forestry can lead to sub-optimal forest management: both scenarios carry the risk that the benefits of northern semi-natural forestry based on native tree species are not fully recognised.	• Commitment to the principles of regenerative forestry • The main raw material, wood, is mainly procured from Finnish and Swedish forests, which keeps transport distances reasonable. • Targets for reducing emissions related to logistics • Science-based advocacy
Technology and data	• **Risk:** Challenges in obtaining primary data for Scope 3 emission calculations undermine the ability to optimise and monitor the impacts of climate action across the value chain. • **Opportunity:** Through R&D&I, technology development and partnerships, Metsä Group can further improve its energy and material efficiency, and the utilisation of side streams. For example, developing technical capture of wood-based carbon dioxide is a big opportunity.	• In the 4.3 °C scenario, the value chain's motivation to generate and share information about emissions is low, so measuring Scope 3 emissions and committing the value chain to emissions reductions is more difficult than in the 1.5 °C scenario. • Partnerships and funding for development and R&D&I projects that seek to produce climate benefits are more difficult to find in a 4.3 °C scenario than in a 1.5 °C scenario.	• Continuous development of Metsä Group's Scope 3 calculation procedures and emissions reduction measures • Common climate targets with core suppliers • Participation in R&D&I forums • Advocacy on behalf of R&D&I funding programmes for wood-based products that produce climate benefits
Markets	• **Opportunity:** Customers' climate targets and consumers' increasing awareness of climate change increase the market opportunities for wood-based products produced with high resource efficiency and high share of renewable energy. In the long term, biogenic carbon dioxide captured from bioproduct mills may provide a new wood-based raw material stream.	• In the 4.3 °C scenario, customers show low interest in climate benefits, leading to lower market opportunities than in the 1.5 °C scenario. • In the 1.5 °C scenario, products that store biogenic carbon for 35+ years have significant market pull, as this is encouraged by the EU regulatory framework	• Cooperation with customers in developing climate-smart solutions • The provision of sustainability data on Metsä Group's products for the value chain • The provision of sustainability services to customers
Reputation	• **Opportunity:** Regenerative forestry and the work to achieve the 2030 Sustainable Development Goals strengthen the climate benefits and acceptability of Metsä Group's operations. However, there is a risk that Metsä Group is unable to provide stakeholders with sufficient evidence of the climate and nature benefits of regenerative forestry and Metsä Group's products. • **Risk:** General acceptance of the use of fresh fibres in short-lived products decreases.	• In the 4.3 °C scenarios, the verification of impacts has been unsuccessful, and stakeholders have become more indifferent. • In the 1.5 °C scenario, success in verifying the impacts on climate and nature benefits is greater.	• Fact- and science-based communication • Metrics are developed to better verify the positive climate and nature impacts related to regenerative forestry and Metsä Group's products • Optimisation of the recyclability of fresh fibre products

A more comprehensive climate risk analysis is published as part of Metsä Group's annual review.

Key physical climate risks

Tyyppi	Description of risk/opportunity	Impact analysis in climate scenarios IPCC 1.5 °C and 4.3 °C	Key management activities
Acute threats	• **Risk:** Storms, droughts and floods cause production interruptions or hinder the transport of raw materials and products. • **Opportunity:** According to analysis of the physical climate risks of production units carried out in 2024, the physical risks related to Metsä Group's production units are significantly below average, which supports the Group's competitiveness in a changing climate.	• The risks have significantly greater impacts in the 4.3 °C scenario than in the 1.5 °C scenario.	• Metsä Group prepares for the risks caused by extreme weather phenomena in risk assessments at both the company and production unit levels. Examples of measures include ensuring adequate wood stocks, water surface management with dam systems and electricity supply in exceptional situations. • Plans for alternative partners or transport routes are in place in the supply chain.
Chronic threats	• **Risk:** Harvesting conditions deteriorate due to the lack of snow and frost, as well as increasing precipitation. • **Risk:** Finnish forests will face a significant increase in temperature during their life-cycle. As a result, the risks of damage caused by storms, floods, forest fires, droughts, and pest insects increase. Emissions from peatland forests increase as the temperature rises. In addition, there are changes in the prevalence of tree species, and non-native species can cause problems in forests.	• The temperature increase caused by climate change is different in different parts of the world. In the 4.3 °C scenario, the long-term (2050) increase in Finland is estimated to be 6–7 C degrees. The effects of risks are more likely and greater in the long than in the short term. • While the increase in the mean temperature is smaller in the 1.5 °C scenario, it is still significant.	• Metsä Group's wood procurement always takes weather conditions and their variation in harvesting into account. Wood is harvested only when conditions allow. If necessary, wood terminals can be utilised to balance the variation caused by harvesting conditions. • Metsä Group's regenerative forestry principles and sustainable forest management services support forests' adaptation to climate change and promote forest biodiversity. A tangible example is the Metsä Group Plus forest management service.

A more comprehensive climate risk analysis is published as part of Metsä Group's annual review.

Key potential economic impacts of climate-related risks and opportunities

Economic impact	Negative	Positive
	• Metsä Group's main transition risks are related to regulation concerning the use of forests and wood-based energy. If realised, these risks may lead to an increase in costs. • The greatest physical climate risks are related to the anticipation of the climate change adaptability of complex natural ecosystems such as forests. Unexpected sudden changes may reduce the availability of wood raw material, leading to increased costs. • According to the EU's Renewable Energy Directive (RED II), the free allocation of allowances in the EU Emissions Trading System (ETS) will change: free allowances will expire after 2025 for mills that use less than 5 % fossil energy. The EU Emissions Trading System (EU ETS) is currently being updated and, according to current data, free allowances will cease completely after 2030. For more information about emissions allowances, see Intangible assets in Metsä Group's financial statements.	• The location of Metsä Group's production units is a strength, supporting economic competitiveness in a changing climate • An analysis carried out by an external partner in 2024 concerning the physical climate risks related to the locations of production units and key supply chains indicated a low risk level. • Sectors posing a substantial transition risk, such as the coal, gas or oil industries, do not have a material impact on Metsä Group's net sales. Metsä Group's production will continue to generate fossil-based carbon dioxide emissions, but the company aims for fossil-free production by 2030. This means that from 2030 onwards, production will no longer generate fossil-based carbon dioxide emissions – only a small amount of biogenic greenhouse gases that are included in the Scope 1 and Scope 2 emissions is generated. • No such assets at Metsä Group's production units have been identified that could be subject to a material transition risk or might lose value due to regulation related to the green transition (stranded assets). • Many Metsä Group products, including fibre-based packaging products and wood products for the construction industry, can replace products made from non-renewable raw materials. The target markets for the Kuura™ textile fibre and Muoto™ products, which are new products under development, are the textile and packaging markets respectively. They are both large global markets. If the development projects lead to commercial-scale production, this will have a major impact on Metsä Group's sales. The capture of wood-based carbon dioxide from the bioproduct mills' flue gases is a major opportunity, and related development work is underway at Metsä Group. The captured bio-based carbon dioxide can be used as raw material in many hydrogen economy products such as chemicals, fuels and materials.

Climate work is integrated into the business

In 2024, the ability of Metsä Group's strategy to respond to climate change was analysed with a climate resilience analysis. The analysis was used in preparing the Climate transition plan, coordinated by Metsä Group's Corporate Affairs unit. The steering group was Metsä Group's sustainability process management team composed of the directors in charge of sustainability matters in the business areas and in Group Services. Metsä Group's Executive Management Team participated in the climate resilience analysis, which covered both Metsä Group's ownership and business strategies and the business areas' strategies.The analysis of climate-related physical and transition risks and opportunities is a key pillar of the strategic approach, and it served as the basis for the resilience analysis. The analysis covered the Group's own operations and value chains.

Metsäliitto Cooperative's owner-members value long-term climate work and continuous development. Indeed, the ownership structure is an important part of the Group's climate resilience. At Metsä Group, climate change mitigation and adaptation and regenerative forestry as part of sustainability work have been integrated into business operations and strategic targets.

Adaptive change capacity and transformative capacity

Adaptive change capacity means the gradual adaptation and mitigation actions taken mainly in the company's own operations whereas transformative capacity means broader measures to promote systemic change in the value chain and communities. According to the analysis, Metsä Group invests in building both of these capacities.

The key uncertainty factor associated with the resilience analysis is the weak predictability of EU legislation. Uncertainty is exacerbated by the fact that many important details are laid down in acts which are not part of the main texts of the directives and regulations. Another significant uncertainty factor concerns the assessment of the climate change adaptability of complex natural ecosystems such as forests.

Our purpose

Advancing bioeconomy and circular economy by sustainably and efficiently processing northern wood into first-class products.

Our vision

To be the preferred partner in developing sustainable business.

Our values

Reliability

Cooperation

Renewal

Responsible profitability

Metsä

Summary of the climate resilience analysis of Metsä Group's strategy

	Strengthening the capacity for adaptive change	Strengthening the capacity for transformation
Forest	• Forest services that enable climate change mitigation and adaptation • Adaptation to climate change conditions in harvesting operations • Reducing use of fossil fuels, as well as backup fuels in harvesting and wood transports	• Implementation and development of regenerative forestry strengthening the state of forest nature • Targets and actions for increasing carbon sequestration in forests
Production	• The high share of fossil-free and self-sufficient energy used in production creates stability • Electrifying part of the energy use in production • Improving raw-material, energy and water efficiency • Product and technology development projects to optimise the use of raw materials and energy and to achieve the strategic 2030 sustainability targets	• Increasing the utilisation of side streams for material use • Further development of the bioproduct mill concept • Development of low-carbon processes in operations with machine and equipment suppliers • Capture of wood-based carbon dioxide and enabling its use as raw material to replace fossil-based raw materials • Further development of regenerative land use: biodiversity plans for mill areas
Products	• Focusing on the fresh fibre strategy: using fresh fibre in tissue paper and paperboard production enables reduced use of water and chemicals compared to recycled fibre • Development of new fibre products: Muoto™ packaging products, Kuura™ textile fibre and the Light Fibre Material for insulating and protective applications and interior design • Other new products, for example lignin products to replace fossil-based chemicals, such as dispersant plasticisers in concrete	• Fossil-free products reduce dependency on the fossil-oil based raw materials • Life cycle emissions of many products are low in global comparison, which offers customers the opportunity to reduce their emissions: lightweight, recyclable and resource-efficient wood-based products • Increasing the production capacity of wood-based products that store carbon for a long time

Cross-cutting themes

Further development of the operational culture based on cooperation and partnerships	Reduction of GHG emissions with customers and suppliers	Strategic R&D&I programmes for fossil-free raw materials, barriers and coatings, side streams, fibre-based products, and optimal use of northern wood	Strategic HR programmes to improve the resilience of personnel, teams and organisation

2. Climate related targets and metrics

In addition to Scope 1, 2 and 3 emissions reduction targets Metsä Group has in place other climate-related targets for forest management, resource-efficient production, and the raw materials and carbon storage of products.

2030 emissions reduction targets

Targeting to zero tonnes of fossil Scope 1 and Scope 2 carbon dioxide emissions by 2030

Metsä Group set its strategic 2030 sustainability targets for the first time in 2018. Many of them are related to climate change mitigation. For example, one of the targets is to have fossil-free mills by 2030. This means that that Metsä Group's mills won't utilize fossil energy nor fossil raw materials or packaging materials and that the Scope 1 and 2 carbon dioxide emissions are zero.

The target only includes fossil carbon dioxide emissions, not other greenhouse gases. The emissions calculation has been carried out in accordance with the GHG protocol. Wood-based energy generates small amounts of biogenic methane and nitrous oxide, which are included in Scope 1 and 2 emissions with fossil-based greenhouse gases. According to Metsä Group's estimate for 2030, the sum of Scope 1 and Scope 2 emissions of biogenic methane and nitrous oxide gases will be approximately 110,000 tCO_2e.

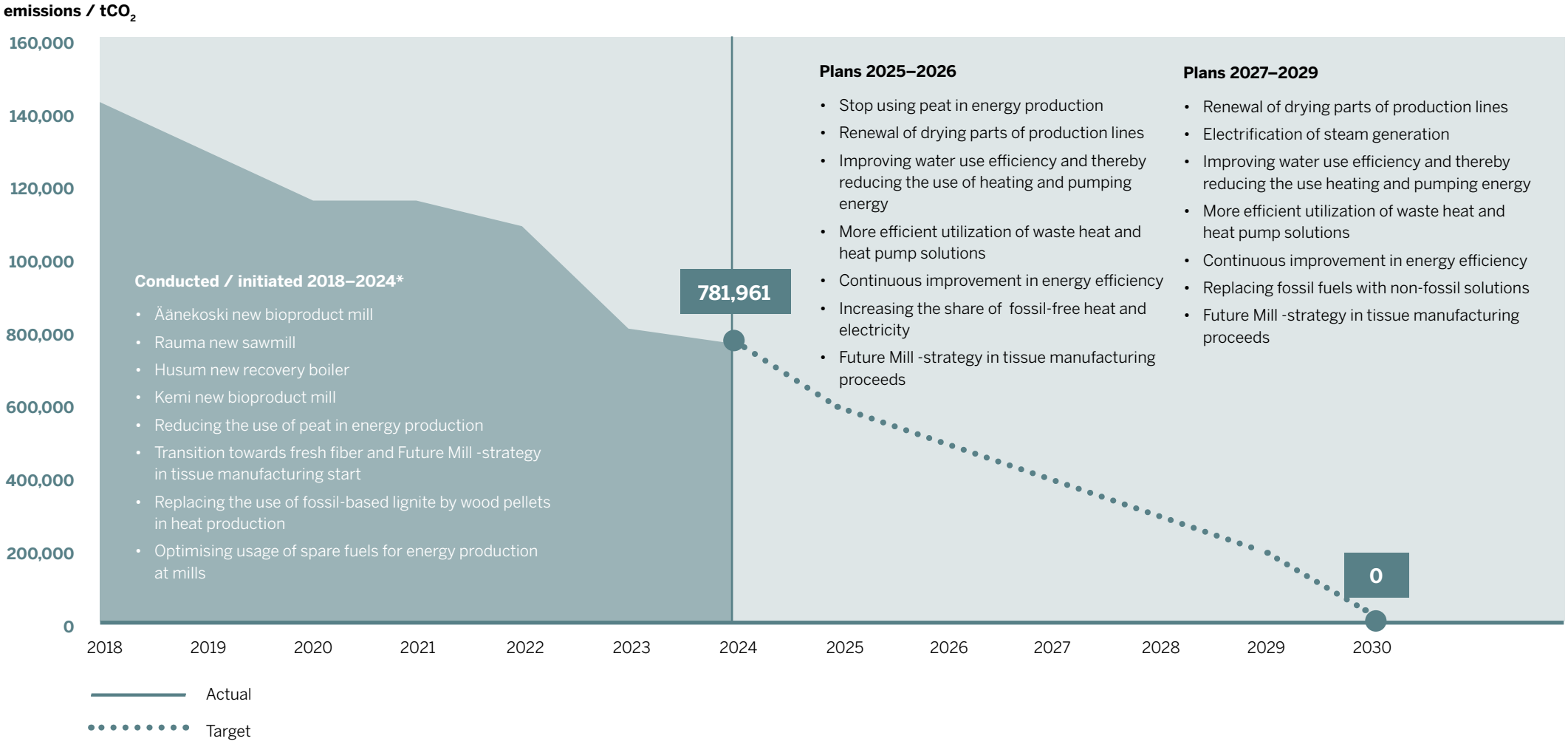
Fossil CO_2 accounts for approximately 90% of Metsä Group's Scope 1 and Scope 2 emissions. The zero target for Scope 1 and Scope 2 emissions of fossil CO_2 therefore corresponds to a reduction of approximately 90 % in Scope 1 and 2 greenhouse gas emissions, indicating that the Scope 1 and 2 target is in line with the Paris Agreement's objective of limiting global warming to no more than 1.5 °C above pre-industrial levels (IPCC pathway)*. In 2024, Metsä Group's own operations (Scopes 1 and 2) accounted for 16 % of the total greenhouse gas emissions while 84 % arised from other parts of the value chain (Scope 3).

A roadmap containing the key measures and related emissions reductions is depicted on the next page.

> The sum of Metsä Group's fossil Scope 1 and Scope 2 carbon dioxide emissions has decreased by 46% from the 2018 level.

* The 1.5 °C climate pathway sets a reduction target for Scope 1 and Scope 2 greenhouse gas emissions, which is 46 % according to the Science Based Targets initiative's target setting tool.

Roadmap including Metsä Group's key measures to reduce Scope 1 and 2 CO_2 emissions



* Averagely low production rate in 2023-2024 also contributed to emission reductions

Targeting to 30%/tkm reduction by 2030 in greenhouse gas emissions from logistics purchased by Metsä Group (Scope 3, category 4)

Metsä Group's current priority area concerning Scope 3 are emissions from logistics purchased by the Group, and the target is a 30 % reduction in emissions calculated per tonne-kilometre by 2030. The target is in force from 2025 onwards and the baseline year is 2022.

The Scope 3 target is not yet in line with the 1.5 °C pathway of the Paris Climate Agreement. Metsä Group continues to improve the calculation of greenhouse gas emissions by using more accurate data and develops ways to reduce Scope 3 emissions in cooperation with partners. As the work progresses, and by 2027 at the latest, Metsä Group will set a Scope 3 emissions target or an overall reduction target for Scope 1, Scope 2 and Scope 3 emissions in accordance with the 1.5 °C transition pathway. At the same time, a detailed roadmap for achieving the goal will be drawn up.

Business area specific targets related to Scope 3 emissions

Some of Metsä Group's business areas have their own specific Scope 3 related emissions reduction targets. Metsä Board set a target in 2019 that 70 % of the suppliers in the company's target group would set greenhouse gas emissions reduction targets in accordance with the SBTi (Science Based Targets initiative) by 2024. In 2024, the share was 24 %.

In 2024, Metsä Tissue and Metsä Forest, which provides wood supply and forest services, set overall emissions reduction targets in accordance with the Paris Climate Agreement. Both business areas aim to reduce their total greenhouse gas emissions by 50 % from the 2022 baseline by 2030. At Metsä Tissue, the reduction will target both the company's own emissions and the value chain's emissions. As wood supply and forest services do not generate Scope 1 and Scope 2 emissions, the reduction will target the value chain's emissions. The targets are valid from 2025 onwards.

Assessing and reducing Scope 3 greenhouse gas emissions includes challenges

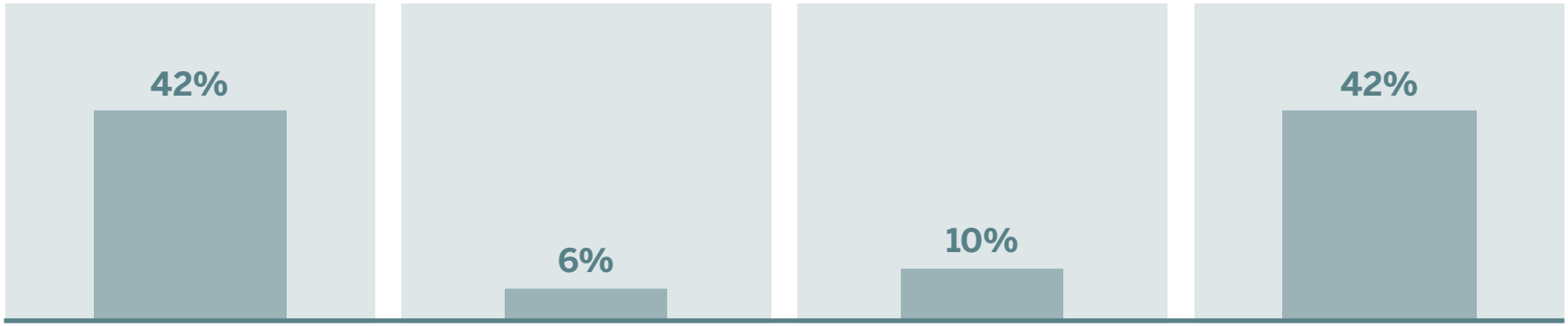
Primary data is not comprehensively available, and thus in some parts of the Scope 3 calculations average emission factors have to be utilized. The modernization of mills and investments in new resource- and environmentally efficient production units increase the Scope 3 emissions, even though these investments enable the provision of products with a lower carbon footprint for the customers.

Carbon pricing mechanisms

Metsä Group's production units are part of the EU Emissions Trading System (ETS). Metsä Group does not have an internal carbon pricing system that would generate actual financial flows. Metsä Board uses an internal carbon pricing system in the income and expense records of production units. Metsä Group's investment calculations for all production units apply shadow prices to carbon dioxide based on the prices of the EU ETS.

Metsä Group does not use carbon units purchased outside of its value chain to offset its emissions. Developments in the voluntary carbon market and related regulation are followed, as carbon units will play a role in future in balancing residual emissions. For example, the EU Regulation on Carbon Removals and Carbon Farming (CRCF) and the Green Claims directive are of key importance.

In 2024 Metsä Group's total greenhouse gas emissions were 5,635,029 tonnes CO_2e (Scopes 1, 2 and 3)



Scope 3 Upstream	tCO_2e	Scope 2	tCO_2e	Scope 1	tCO_2e	Scope 3 Downstream	tCO_2e
Purchased goods and services	**1,152,998**	Market-based indirect GHG emissions from purchased energy	**339,874**	Direct GHG emissions from own operations	**546,696**	Downstream transportation and distribution	**28,462**
Capital goods	**166,678**					Processing of sold products	**1,243,855**
Fuel and energy-related activities	**177,937**					Use of sold products	**22,452**
Upstream transportation and distribution*	**863,457**					End-of-life treatment of sold products	**1,068,496**
Waste generated in operations	**6,437**					Investments	**5,889**
Business travel	**3,822**						
Employee commuting	**7,977**						
	2,379,306		**339,874**		**546,696**		**2,369,154**

* Part of the emissions in category Upstream transportation and distribution occur in donwstream

Other key climate related 2030 targets

Metsä Group set its strategic 2030 sustainability targets for the first time in 2018. All the targets and related updates are approved by the Group's Executive Management Team and Board of Directors.

The targets were updated in 2022 and 2024 based on a double materiality assessment. Based on the results of the materiality assessment, Metsä Group's key sustainability topics are climate change, biodiversity, the environmental impacts of products, and the occupational safety of its own workforce and employees in the value chain. In addition to the environment, the strategic 2030 sustainability targets include aspects of social responsibility, and good governance and corporate culture.

Versatile climate targets

Many of the 2030 targets under the theme environment are related to climate change mitigation or adaptation. Targets related to resource efficiency can also offer climate benefits. The targets and progress in 2024 are summarised in the table on the next page. For each target, a roadmap of the measures needed to achieve the target has been created. Highlights of these measures are described in the chapter Measures to reach the targets.

Metsä Group's climate-related metrics and strategic 2030 targets and progress in them

Target	2030 target	2024 actual	2024 progress
E – ENVIRONMENT			
1. Securing biodiversity and ecologically sustainable of forestry			
Retention trees on regeneration felling sites, %	100	97	
High biodiversity stumps on harvesting sites, %	100	98	
Spruce as the only tree species after young stand management, %	0	26	
Measures promoting biodiversity, number	10 000	6 586	
2. Mitigating climate change and reducing emissions			
Energy efficiency index, base year 2018	90	104	
Fossil-based carbon dioxide emissions (Scope 1 + Scope 2 market-based), t	0	781 961	
Fossil-free raw materials and packaging materials, share of dry tonnes, %	100	99,2	
Amount of forest regeneration and young stand management from the 2018 level, %	+30	18	
Amount of forest fertilisation from the 2018 level, %	+50	-22	
Share of continuous cover forestry in peatland forest regeneration, %	30	15	
Amount of carbon stored in wood products from the 2018 level, %	+30	-25	
3. Resource efficiency and sustainable production			
Reduction in process water use per produced tonne from the 2018 level, %	-35	-11	
Process waste delivered to landfills, t	0	14 696	
G – GOVERNANCE			
Share of certified wood, %	>90	93	
Suppliers' commitment to the Supplier Code of Conduct, share of total purchases , %	100	99,1	
Supplier assessments and audits of core suppliers, %	100	70	
Joint sustainability targets with partner suppliers, %	100	100	

Progress in 2024 compared with the previous year

- Exceeds target (significant progress)
- On target (progress as planned)
- Short of target (no progress or weaker progress)

A more detailed description of all Metsä Group's strategic sustainability ESG 2030 targets and progress in them can be found in Metsä Group's annual review. Somewhat updated targets in force from 2025 onwards have been published on Metsä Group's website.

Overview of the progress in climate-related targets in 2024

- **Retention trees on regeneration felling sites** – In 2024, progress in the target was as planned.
- **High biodiversity stumps on harvesting sites** – In 2024, progress in the target was as planned.
- **Spruce as the only tree species after young stand management** – The progress made is insufficient for achieving the 2030 target. Metsä Group will provide more training to its employees and forest management entrepreneurs and enhance communication with forest owners.
- **Measures promoting biodiversity** – Progress in the target was better than expected. Most of the measures consist of Metsä Group Plus agreements, the number of which increased considerably during 2024.
- **Improvement in energy efficiency index from the 2018 level** – The production curtailments caused by the market situation weakened energy efficiency in 2024. Due to the gas explosion at the Kemi bioproduct mill, a long production outage occurred at the bioproduct mill and Metsä Board's neighbouring board mill. A total of 60 projects involving energy efficiency measures were implemented in 2024.
- **Fossil-based carbon dioxide emissions (Scope 1 and Scope 2 market-based)** – Investments and energy efficiency measures reduced Scope 1 emissions. Scope 2 emissions increased from the previous year due to higher energy consumption. Overall, fossil-based carbon dioxide emissions (Scope 1 and Scope 2 market-based) have decreased by 46% from the 2018 level.
- **Fossil-free raw materials and packaging materials, share of dry tonnes** – The share of fossil-free raw materials and packaging materials of dry tonnes remained at a good level, with nearly all the raw materials and packaging materials being fossil-free.
- **Amount of forest regeneration and young stand management from the 2018 level** – In 2024, progress in the target was better than expected. The amount of young stand management especially increased.
- **Amount of forest fertilisation** – Development was not in line with the target in 2024. The sales of growth fertilisation after the market disruption in 2024 did not progress fully as planned. Actions for increasing the fertilised area in 2025 have been defined and initiated.
- **Share of continuous cover forestry in peatland forest regeneration** – In 2024, progress was not as planned. In 2024, Metsä Group expanded the Metsä Group Plus service to the regeneration of lush peatlands.
- **Amount of carbon stored in wood products from the 2018 level** – The market situation has led to production curtailments at many production units, reducing the production volumes of wood products and thus the amount of carbon stored.
- **Reduction in process water use per produced tonne from the 2018 level** – Water use efficiency measures and the moderate operating rate of machines due to the market situation improved the efficiency of process water use in 2024.
- **Process waste to landfills** – In 2024, the volume of landfill waste decreased from the previous year, while the utilisation rate remained at the same level as in 2023. Production curtailments have affected the volume of process waste.
- **Share of certified wood** – The target set for 2030 was achieved in 2023. The certification target has been updated, and from 2025, the new target is 100%.
- **Suppliers' commitment to the Supplier Code of Conduct, share of total purchases** – Progress towards the 2030 target was as planned.
- **Supplier assessments and audits of core suppliers** – Significant progress was made in the target in 2024. EcoVadis sustainability assessments were widely adopted in procurement to evaluate suppliers. The number of supplier assessments also increased slightly from the previous year.
- **Joint sustainability targets with partner suppliers** – A sustainability target has been agreed with all current partner suppliers, which means the target has been achieved. In 2024, cooperation with partners continued in the form of more detailed target specification and plans – and with some suppliers, in implementation.

Preparing the 2050 target and transition path

Metsä Group has not yet set any official post-2030 emissions reduction targets, but the planning of the Paris aligned net-zero 2050 transition pathway is underway, particularly regarding Scope 3 emissions. The target for fossil-based Scope 1 and Scope 2 carbon dioxide emissions is zero as soon as by the end of 2030. Our planning work is based on the general guidance of the Intergovernmental Panel on Climate Change (IPCC), as no internationally recognised sector-specific decarbonisation development path is currently available for Metsä Group's sector, the forest industry.

For the time being Metsä Group's production will continue to generate fossil-based carbon dioxide emissions, but the company aims for fossil-free mills by 2030. This means that from 2030 onwards, production will no longer contain locked fossil carbon dioxide emissions. However, a small amount of biogenic greenhouse gases that are included in Scope 1 and Scope 2 emissions will still be generated.

Metsä Group is preparing to set a net-zero target in accordance with the Paris Climate Agreement in 2027 at the latest. Metsä Group will be under the scope of the new EU Corporate Sustainability Due Diligence Directive (CS3D) as of July 2027.
The Directive requires companies to have a 2050 net-zero climate pathway. The national implementation of CS3D is still underway: national legislation will be published by 26th July 2026. The European Commission is expected to publish further guidance on the Directive's implementation.

3. Measures to reach the targets

Metsä Group's plan to mitigate and adapt to climate change includes action programmes related to the climate impacts of production, supply chain and products, as well as forest management.

Towards regenerative forestry

Metsä Group's wood supply does not cause deforestation. All the countries from which Metsä Group procures wood have issued legislation requiring forests to be renewed after harvesting. Metsä Group procures most of its wood from Finland and some from Sweden and the Baltic countries. Of the wood used by Metsä Group, 84 % is procured from Finnish forests, mostly from the forests of Metsäliitto Cooperative's more than 90,000 owner-members.

All the wood procured by Metsä Group comes from either certified forests or forests that meet the requirements of controlled origin (PEFC controlled sources, FSC® controlled wood: Metsäliitto Cooperative's respective logo licences are FSC-C014476 and PEFC/02-31-03). In 2024, we procured a total of 29.3 million cubic metres of wood, of which certified wood accounted for 93 %. We do not procure wood from old-growth forests, forests defined as natural forests, or forests that are worthy of protection.

Forests and forest management are subject to different societal expectations and climate-related hopes and pressures. In commercial forests, it is essential to find a balance between the profitable commercial use of forests (enabling the substitution of fossil-based raw materials with wood), targets related to climate change adaptation and mitigation, and measures promoting biodiversity. The management of the Group and owner-members of the Cooperative participate actively in public discussion about forestry and its development.

According to estimates, Finnish forests will have to deal with a substantial temperature increase during their life-cycle due to climate change. As a result, the risks of damage caused by storms, floods, forest fires, droughts, and pest insects increase. Emissions from peatland forests increase as the temperature rises. In addition, changes will be seen in the prevalence of tree species and in forest species, and non-native species may cause problems in forests. If the state of forest nature deteriorates, forests will be more vulnerable to the consequences of climate change, such as extreme weather phenomena and the spread of pests. Strengthening biodiversity has many positive impacts on forest health and growth potential, including an increased capacity to adapt to climate change.

> Wood production is to be carried out in a way that the functioning of the forest ecosystem is safeguarded and the diverse production of ecosystem services is preserved.

Semi-natural forestry as the basis

Metsä Group does not own any forest significant for its wood procurement. Metsä Group's Wood Supply and Forest Services handles wood raw material procurement and provides forest management services to forest owners and especially to owner-members.

Forest use is guided by Metsä Group's principles for forest use and forest management, in which the company undertakes to increase the amount of carbon stored in forests and promote forest biodiversity, among other things. Metsä Group's Wood Supply has certified quality and environmental management systems. Our forest and nature management and harvesting methods are based on up-to-date research, and we engage in active long-term cooperation with a diverse research community.

After regeneration felling, the forest is renewed quickly. The faster and better a new forest is established, the sooner the forest will begin to bind carbon from the atmosphere. Whenever available, seed and seedling material of domestic tree species from seed orchards is used in regeneration. The use of material from seed orchards helps trees grow better than naturally generated trees. Young stand management and thinning ensure that the forest remains vibrant, and that forest growth focuses on trees that are most valuable both economically and in terms of climate change mitigation. Mixed forests increase forest biodiversity and resilience to storms and insect damage, for example.

Finnish commercial forests are semi-natural, which means that wood production based on native tree species is integrated into the natural ecosystem, which also produces numerous other ecosystem services such as natural biodiversity maintenance, nutrient cycling, water purification, pollination, climate regulation and recreation.

Metsä Group has developed carbon calculation metrics related to forests to verify the impact of wood supply and forest management on the forest carbon balance. From 2025, the calculator is available to forest owners as part of the digital Metsäverkko service. Metsäverkko is an online service offered by Metsä Group to help forest owners manage their forest assets and adopt climate-smart forest management solutions. Some of the Metsäverkko services such as the carbon calculator are available only to Metsä Group's owner-members.

Examples of Metsä Group's forest services and wood supply actions and policies that promote climate-smart forestry

Metsä Group's action/ policy	Impact on climate change mitigation and/ or adaptation
For industrial use only spruce, pine and birches and aspen with a diameter of less than 40 centimetres are purchased. Other broadleaved trees such as rowan and alder are left in the forest.	Increasing the number of rare broadleaved trees, which account for about 3 % of the volume of wood in Finnish forests, increases species richness.
To its owner members, Metsä Group recommends nature management to herb-rich forests and sunlit slopes and voluntary conservation for sites of high protection value.	Improving the living conditions of endangered forest species and increasing forest biodiversity. Although herb-rich forests and sunlit slopes account for only a small share of Finland's forest area, they are home to more than half of Finland's endangered forest species.
Continuous cover forestry is chosen in areas where it is suitable. In peatland forests, the target share is 30 %.	Continuous cover forestry is one way to safeguard forest biodiversity.
Mixed forests are promoted by offering forest owners a forest regeneration service in which both spruce and pine are cultivated in the same area. In young stand management, it is ensured that enough good-quality broadleaved trees are left in the forests to grow.	Strengthening forest biodiversity.
During thinning and regeneration felling retention trees are left and high biodiversity stumps are made to faster generate more decaying wood on harvesting sites.	Decaying wood provides a habitat for many species that depend on it, and they, in turn, diversify the range of tree species, maintaining resilience in changing conditions.
Buffer zones where forestry is carried out more lightly or not at all are left along waterbodies.	Buffer zones are used to safeguard the state of waterbodies and the biodiversity of the area.
Metsä Group's goal is to increase the amount of forest fertilisation in our owner-members' forests by 50 % from the 2018 level by 2030.	Fertilisation improves the growth of trees and enhances the carbon sequestration of forests.
In collaboration with CollectiveCrunch Metsä Group has developed an application for our owner-members that is based on artificial intelligence, machine learning and open data, and helps identify and visualise storm and insect damage.	Thanks to the application, felling can be carried out before insect damage has time to spread. Forest owners can be offered a deeper insight on the wellbeing of forests and information on the changes taking place in forests more rapidly.

What is regenerative forestry?

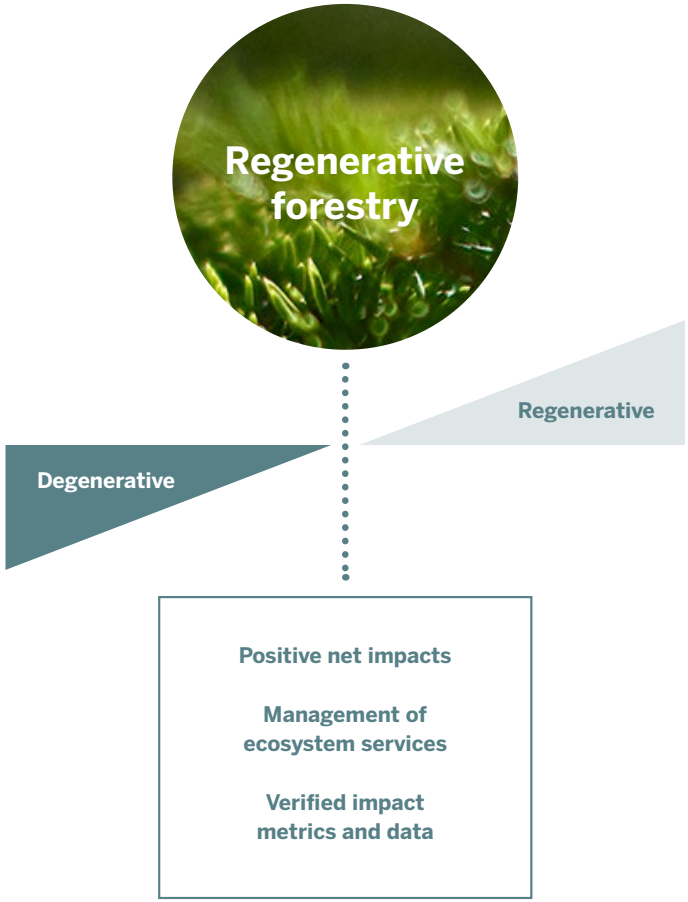
In the spring of 2023, Metsä Group committed to the principles of regenerative forestry. The goal is to ensure that Finnish forest assets are transferred in a more vibrant, diverse and climate resilient condition from one generation and owner to the next, and that the impacts of the actions taken to strengthen the state of forest nature compared to the current situation can be measurably and verifiably demonstrated by 2030 at the latest. Both R&D&I cooperation and the development of forest management services play an important role in achieving results. Measuring and monitoring the quality and impacts of forest management using the latest technologies is an integral part of regenerative forestry.

To maintain the high biodiversity capacity of forests, regenerative forestry respects the following key principles:

- Wood production is integrated into existing ecosystems and does not cause land use change.
- Tree species are grown in the conditions to which they have adapted during their evolution.
- Native tree species, naturally occurring in the harvested areas, are used commercially. Each tree species has a significant number of other species that either directly or indirectly depend on it in their various ecological roles. Wood production based on native tree species creates a high baseline for the proportion of native species in the area.

In Finland, forests are multi-use forests. Everyone's rights apply, meaning that you can freely go on excursion in the forest, even if you don't own it. This applies in wood procurement areas too. The forests are a source of berries, mushrooms and herb crops, that can be collected freely. The goal of regenerative forestry is to develop forestry so that the various ecosystem services – benefits provided by nature, from carbon sinks to pollinators – can be measured, and that wood is produced as part of a developing multi-objective production model based on ecosystem services.

Regenerative forestry provides a means to strengthen the state of forest nature and comprehensively manage ecosystem services, which improves forests' climate resilience. Regenerative forestry also supports the role of forests as carbon sinks and promotes their long-term health. It also promotes the long-term availability of wood raw material, making more wood available for substituting non-renewable raw materials.



> Metsä Group Plus forest management model is a tangible example of promoting regenerative forestry.

In regenerative forestry, forest biodiversity is supported through various practical measures. The Metsä Group Plus forest management model is a tangible example of promoting regenerative forestry. The model includes measures that safeguard and improve the state of forest nature more comprehensively than is required by current standard practices. For example, more retention trees and high biodiversity stumps are left per hectare during felling. Regarding valuable habitats and littoral forests, the model represents the highest level of requirements currently in use. The Metsä Group Plus service is available for Metsä Group's owner-members. Metsä Group pays an additional bonus per hectare for Metsä Group Plus wood to compensate any loss of income caused by the additional measures. The service was introduced in 2023, and in 2024, about one third of all Metsä Group's wood purchases were made in accordance with the Metsä Group Plus agreement.

Opting for regenerative forestry is always the forest owner's choice and decision from the services available. In promoting regenerative forestry, the focus is on understanding the impacts of the choice, as well as collaboration and dialogue with a diverse stakeholder network, especially researchers.

Regenerative forestry

- Strengthens forests' climate resilience
- Supports the health of forests and their role as carbon sinks and storage
- Promotes the long-term availability of wood raw material, ensuring that more wood is available for substituting non-renewable raw materials

Principles of regenerative forestry

Diversification of structural features

Utilising native tree species

Species-specific measures

Improving the management of peatlands and water protection

Increasing the number of old trees

Diversification of tree species

Protection of valuable habitats

Improving the biodiversity network

Special measures for herb-rich forests, ridge areas and burned forest areas

Increasing varied decayed wood

Promoting biodiversity outside of commercial forests

Biodiversity plans will be implemented for all mill sites owned by Metsä Group and the surrounding areas in the Group's ownership. The initiative was launched in 2023 for the Kemi mill site, which serves as a pilot project. One of the key partners is the Villi Vyöhyke association.

In Kemi, the planning areas include the mil area and the nearby real estate owned by Metsä Group, parts of which are also in recreational use.

Metsä Group wants to develop an international operating model, the aim of which is to create a change in the land use of the built environment. The model is based on the following principles of regenerative land use:

- Implementing solutions that maintain and enhance the native character of the local nature
- Supporting the occurrence of threatened species in the built environment
- Safeguarding the local and cultural-historically relevant species in the area
- Identification and conservation of species reflecting local industrial history
- Preventing invasive alien species in line with national targets
- Identifying and safeguard ecosystem services in the area as municipal services
- Creating a sense of community and working together locally
- Supporting and developing nature solutions that serve environmental education
- Combining art and culture with science-based solutions to support the natural environment
- Innovating new approaches to the development of regenerative land use

Metsä Group's Kemi mill area in Finland is the most important nesting area in Europe of the rare Terek sandpiper (*Xenus cinereus*).

Funding programme for nature projects

In 2021, Metsä Group launched a ten-year funding programme for nature projects. The focus is in funding regionally effective development projects in Finland that are carried out outside of commercial forests and support biodiversity or improve the state of waterbodies. The funding programme is a gratuitous programme detached from the Group's own impacts and value chains. Selection of projects for the funding takes place once a year. To date (Q4/2024), more than 60 different projects across Finland have received funding, which totals around 1.8 million euros.

Aiming for fossil-free mills

Concerning its own production, Metsä Group's plan for climate change mitigation comprises investments and measures for replacing fossil fuels with renewable fuels and fossil free electricity at all the Group's production units and power plants. A roadmap for achieving fossil free operations has been drawn up for each production unit.
The measures apply to the fuels and backup fuels used at power plants and to the process fuels used at production units. The company will also transition to fossil-free alternatives in its purchased energy. In addition, Metsä Group improves the efficiency of its energy and water use through continuous development and investment. Reducing water use is a way of mitigating climate change, as process water utilization and wastewater treatment consume energy, causing greenhouse gas emissions.

Metsä Group is also committed to finding fossil-free alternatives for all the raw materials and packaging materials it uses, as well as to the continuous improvement of environmental and energy efficiency. Environmental management and continued environmental performance are guided by the requirements of the production units' certified quality, environmental and energy management systems, and the Principles of Environmental Management.

At all Metsä Group production units, energy efficiency work is managed by an energy efficiency coordinator, supported by the ISO 50001-compliant energy management system. Energy efficiency measures are documented, and their calculated savings are reported as part of annual reporting.

> In 2024, 91.3 % of the energy and 99.2 % of the raw materials utilized in Metsä Group's mills were fossil-free.

Examples of the actions taken in production to mitigate climate change

Metsä Wood

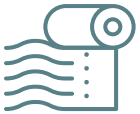
- The new Kerto® LVL mill under construction in Äänekoski. The mill's annual production capacity is approximately 160,000 cubic metres, which represents a 50 % increase in the company's total Kerto® LVL capacity. The value of the investment is 300 million euros, and the mill is expected to begin production in late 2026. Kerto® LVL, made from wood veneers, is a construction material with high added value. The strong Kerto® LVL products are a material-efficient solution for increasing the use of wood in construction, and they store biogenic carbon throughout their life-cycle.

Metsä Fibre

- All pulp producing mills (Kemi, Äänekoski, Rauma, Joutseno) are BAT-aligned, i.e., based on best available techniques, and offer an industrial platform for collaboration enabling synergy befits.
- Production start-up at the new Kemi bioproduct mill in 2023. The mill produces 1.5 million tonnes of softwood and hardwood pulp annually, as well as many other bioproducts. The value of the investment is around 2 billion euros. As the mill does not use any fossil fuels, fossil-based CO_2 emissions decrease by some 68,000 tonnes (25 % of Metsä Fibre's Scope 1 and Scope 2 emissions) compared to the former mill*, even though the new mill has a higher production capacity. The new mill's production process is significantly more energy efficient. The mill produces 2.0 TWh of renewable electricity annually and has an electricity self-sufficiency rate of 250 %. The surplus renewable electricity is supplied to the national grid.

Metsä Board

- The capacity expansion of the Kemi board mill was completed in 2023. In accordance with the development programme, the expansion also involved investments that improve the mill's water use by 40 % and energy use by 5 % per tonne of paperboard produced.
- Renewal of the Husum pulp mill's turbine and recovery boiler (2023). This increased the mill's bioenergy production and increased its electricity self-sufficiency from 50 % to more than 80 %. The value of the investment is approximately 360 million euros.
- The renewal of the turbine and generator of the Kyro board mill's biopower plant in 2024 improved the power plant's efficiency and increased electricity self-sufficiency from 30 % to 50 %. The investment also increased the share of fossil-free electricity at the mill.
- The Simpele board machine's renewal is underway, enabling the replacement of fossil fuels with renewable ones, among other things.



Metsä Tissue

- In 2024, the mills had a total of 18 energy efficiency investment projects underway, amounting to total annual energy savings of nearly 30,000 MWh.
- The Future Mill strategy programme, one of the objectives of which is to reduce fossil-based Scope 1 and Scope 2 CO_2 emissions to zero by 2030. For example, in 2023–2025, the Mariestad tissue paper mill will be modernised and expanded, which will increase the share of fresh fibre in production to 80 % and reduce CO_2 emissions per tonne produced. The value of the investment is approximately 370 million euros. In 2025–2030, an investment programme of approximately 100 million euros will be carried out at the Mänttä tissue paper mill to modernise the mill and improve energy and water efficiency. The company is also planning to construct a new tissue paper mill in Goole in the UK in the next decade. In 2023, the Kreuzau mill in Germany switched from coal to wood pellets, thanks to which the mill's Scope 1 greenhouse gas emissions decreased by roughly 66 %, and Metsä Tissue's Scope 1 emissions by more than 30 %.

* Benchmark: 2022 emissions from the old Kemi pulp mill with a production capacity of 0.60 million tonnes per year

Circular economy integrated to climate work

In its environmental policy, Metsä Group is committed to using raw materials, water and energy efficiently, and to continuously developing its operations. The side streams generated in production processes are primarily used as raw material or energy. Metsä Group takes advantage of synergies between its production units and develops industrial cycles and the recyclability of products.

Developing the circular economy is in the core of Metsä Group's strategy and operations. The Group's structure, which brings together large part of the value chain of wood-based products, offers unique opportunities. The key is to optimise the material, energy, data and value flows from the entire system's perspective.

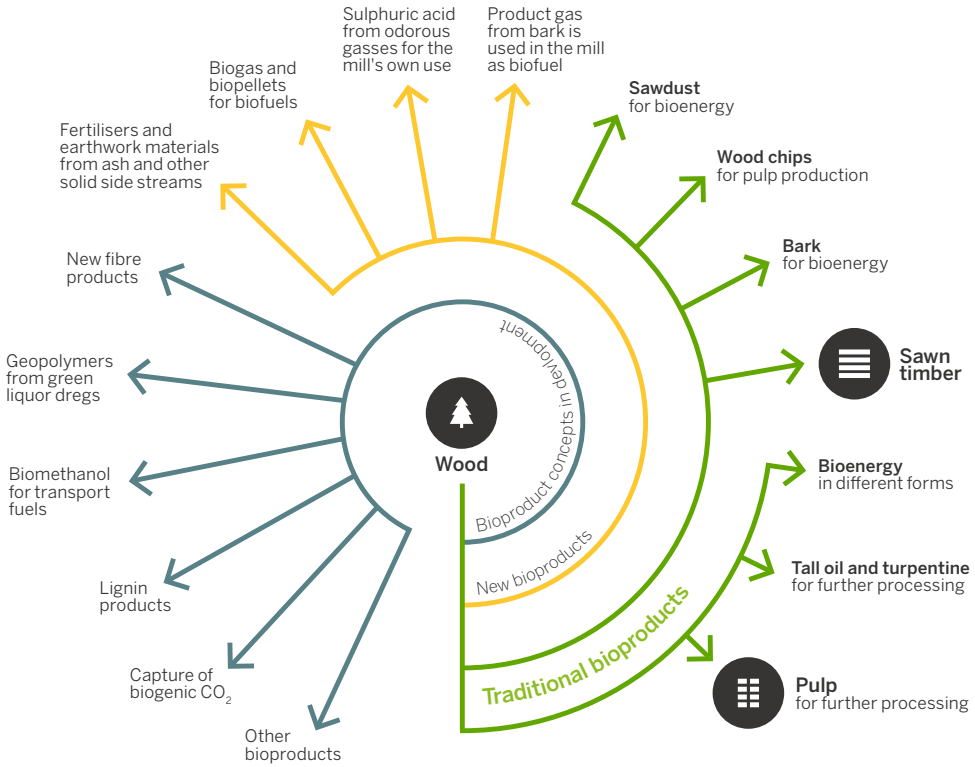
Metsä Group focuses on integrated production units

For example, the Äänekoski bioproduct mill completed in 2017 and the Kemi bioproduct mill completed in 2023 are based on the ecosystem concept, exemplifying industrial symbiosis, in which an entity formed by several companies offers synergies in resource use. The bioproduct mills have an advanced chemical cycle in which water and chemicals are recycled and returned to the process to be utilized again. Even some of the emissions are used as raw material: odorous gases are used in making sulphuric acid, which the mill needs for example in producing tall oil.

Most of Metsä Group's production side streams are utilized and only a relatively small share of them is delivered to landfills. Wood-based waste and by-products, sludge, ash, and lime are used in soil improvement and landscaping, fertilisers, chemical industry's applications, and in energy production. One of Metsä Group's 2030 targets is that zero process waste ends up in landfill.

> Cooperation with customers and partners is key and the aim is that the whole is more than the sum of its parts, in terms of both value creation and environmental benefits.

Utilisation of main and side streams in our bioproduct mill concept



The Circular Economy Green Deal

Metsä Group joined the voluntary national initiative Circular Economy Green Deal in 2024, the year it was launched. The initiative is coordinated by the Finnish Ministry of the Environment and the Ministry of Economic Affairs and Employment.

The participants set targets for 2035 and commit to actions that promote a low-carbon circular economy. The initiative is based on science-based prework, in which the Finnish Environment Institute, VTT Technical Research Centre of Finland, Natural Resources Institute Finland and the Geological Survey of Finland identified the most important areas of actions in terms of the circular economy transition. Prior to their adoption the commitments are assessed by a group including representatives of research institutes.

Metsä Group is committed to investing in research and development related to the further processing of its industrial side streams and set itself the goal of commercialising three significant new products or solutions based on Metsä Group's side streams by 2035. The product or solution can be commercialized either by Metsä Group or by its partner, however, in such a way that Metsä Group has played a significant role in the development work. Commercialization in this context means annual sales of at least hundreds of tonnes or equivalent commercial agreements.

Another target is to reduce Metsä Group's annual bioenergy production based on the combustion of production side streams so that it is 1,000 GWh lower in 2035 than in 2025. Improving energy efficiency and developing energy production towards non-combustion-based solutions, for example through electrification, saves valuable wood raw material for material use with higher added value. The flows of materials and energy are interconnected, and the development progresses gradually, taking the whole into account.

Current and planned investments

Metsä Group invests in fossil-free operations and the efficient use of energy, water and materials. In the transition to fossil-free mills and other financing plans for industrial activities, the aim is to make use of green financing sources. As a rule, investments are financed with equity, but the largest future investments may require external financing, and possible future financing needs have been taken into account in the Green Finance Framework.

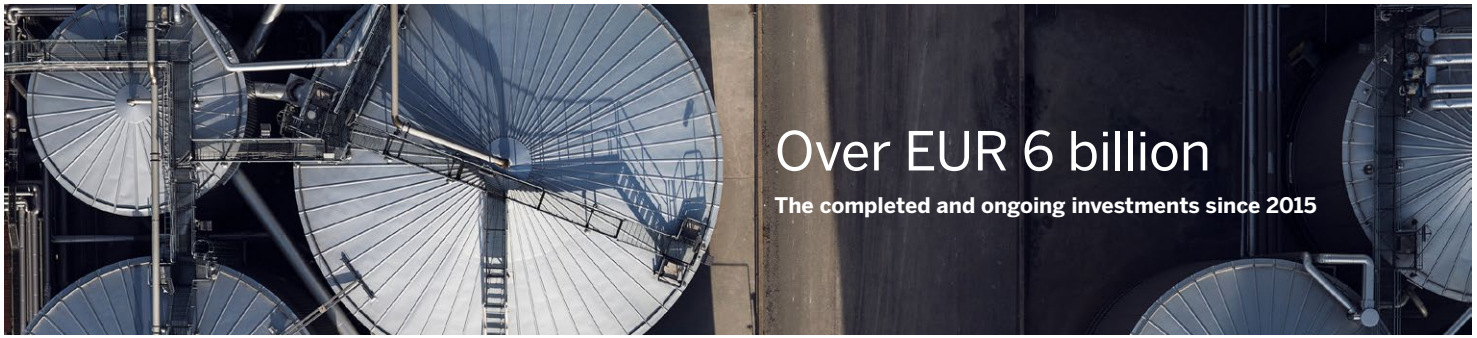
The starting point for planning new investments is a high level of automation and the best available technology. It is impossible to calculate the exact capital expenditure for climate measures because some of the costs are indirect and are incurred as part of other investments.

Major investments in Finland and Sweden

Metsä Group's completed and ongoing investments since 2015 total around six billion euros. In recent years, the key investments in achieving fossil-free production have been the Kemi bioproduct mill, the renewal of the recovery boiler and turbine at the Husum pulp mill, the renewal of the turbine at the Kyro board mill, and the ongoing renewal and expansion of the Mariestad tissue paper mill.

Future investments include for example the electrification of boilers and processes that still use fossil fuels. Metsä Group's EU Taxonomy-aligned sales, capital expenditure and operating expenses are presented in our annual review. Metsä Group's core business is not currently included in the classification criteria of the Taxonomy. Therefore, the share of Taxonomy-eligible turnover is small and and not equal with the investments included in the transition plan. In 2024, Metsä Group carried out an assessment of physical climate risks for each production unit, thus improving its taxonomy alignment. Metsä Group has no significant capital investments in coal, oil or gas.

Metsä Group invests in fossil-free mills and development of industrial ecosystems



2016–2019

- Plywood and Kerto LVL investments
- New paperboard machine at Husum
- Bioproduct mill in Äänekoski

2020

- Demo plant for the Kuura textile fibre in Äänekoski

2022

- Demo plant for the Muoto fibre product in Äänekoski
- Renewal of the tissue paper machine in Mänttä
- New sawmill in Rauma
- Recovery boiler investment for the pulp producing mill in Husum

2023–2024

- Bioproduct mill and renewal of linerboard mill in Kemi
- Expansion of the Husum paperboard mill
- Expansion of the Mariestad tissue paper mill
- New Kerto LVL mill in Äänekoski
- Investment programme at Mänttä tissue paper mill
- Demo plant for a lignin product
- Modernisation of the Simpele board mill

Planned potential investments

- New pulp drying machine at the Husum pulp producing mill
- Tissue paper mill in Goole
- Mill for the Muoto fibre product
- Kuura textile fibre mill
- Facility to capture wood-based carbon dioxide
- Investment programmes for Kyro and Husum board mills
- Change of production on Husum BM2 line to foodservice packaging papers and siliconised greaseproof papers

Green financing

Since 2019, Metsä Group has had a Green Finance Framework in place that enables the issuance of green debt instruments in line with market practices and integrates Metsä Group's strategic sustainability 2030 targets into financing. The framework was updated in July 2024, and Sustainalytics has given a second-party opinion on it.
The framework especially supports the financing or refinancing of environmentally sustainable investments that contribute to Metsä Group's key environmental targets.

Metsäliitto Cooperative has a multicurrency revolving credit facility (RCF) of EUR 200 million (expiring 2030). The margin of the RCF is linked to sustainability criteria that are based on the following Metsä Group 2030 sustainability targets:

- Zero tonnes of fossil Scope 1 and Scope 2 carbon dioxide emissions
- Increasing the share of certified wood in wood supply

Metsä Board has a bank financing facility consisting of a loan of EUR 100 million (expiring 2026) and a multicurrency revolving credit facility (RCF) of EUR 200 million (expiring 2027). The margin of the RCF is linked to sustainability criteria that are based on selected Metsä Board's 2030 sustainability targets:

- Reduction in specific water consumption
- Reduction in specific energy consumption

Solutions for customers' climate work

Metsä Group manufactures wood products that are used by millions of people in their daily lives all around the world. The focus is on wood products, pulp, paperboards, and tissue and greaseproof papers. Wood is the main raw material for all Metsä Group's products.

Resource-efficient use of renewable wood raw material is at the core of Metsä Group's operations. Every part of the tree is used efficiently and for the most suitable purpose. The strongest part of wood – that is, log wood – is used for mechanical wood products such as sawn timber and construction elements. Pulp is made from pulpwood obtained from trees with a smaller diameter than log wood or the top of the tree. Small-diameter wood is obtained for example from thinning carried out as a forest management measure. Thinning helps the trees remaining in the forest grow sturdy faster, making them more suitable raw material for long-lasting wood products, while maintaining strong forest growth and carbon sequestration.

Climate benefit as a part of the value proposition of many products

Metsä Group's products' raw materials and packaging materials are 99.2 % fossil-free. The goal is that all the raw materials and packaging materials utilized in Metsä Group's production will be fossil-free by 2030*.

Metsä Group's products offer key features for climate change mitigation, including the possibility to replace fossil-based raw materials and store biogenic carbon in mechanical wood products for a long time. Metsä Group's long-term efforts to promote renewable energy and resource efficiency can be seen in the good results in carbon footprint calculations based on the product life-cycle analysis. Climate benefit is a key part of the value proposition of many Metsä Group's products. Most of these products are exported, to all continents.

* From 2025 onwards, recycled plastics will also be accepted in the fossil-free target for product packaging materials.

Collaboration with customers is an important part of the climate work

The built environment accounts for about one third of global greenhouse gas emissions. Increasing the share of wood in construction applications often offers climate benefits. Wood construction is mentioned increasingly in the EU climate initiatives. Pulp production, in its turn, is often the base process in the production of innovative products, enabling the various properties of wood to be used for diverse needs.

Collaboration with customers is a crucial part of Metsä Group's climate group. A wide range of development and cooperation projects with customers is carried out, in which climate benefits are an important part of the results. Metsä Group also offers customers training on climate themes and support for life-cycle analysis to determine the climate impacts of Metsä Group's products in customers' applications.

Development work related to several new products to replace products made from non-renewable raw materials is on-going in collaboration with partners. Of Metsä Group's own development projects, Kuura™ textile fibre and Muoto™ 3D fibre products have progressed furthest. Utilising production side streams in new products in collaboration with partners is at the core of Metsä Group's circular economy work.

Examples of key features of products and services for climate change mitigation

Metsä Wood

Main products

Kerto® LVL, birch and spruce plywood and processed sawn timber

Examples

- Wood products used in construction typically have a long service life, enabling the long-term storage of bio-based carbon.
- The Kerto Ripa® wood element construction concept improves material efficiency promoting the efficient use of wood. For example, using Kerto® LVL in floor construction can reduce emissions by as much as 70 % compared with reinforced concrete.*
- Metsä Wood has launched a hybrid element in cooperation with a concrete manufacturer partner that combines the best features of concrete and Kerto® LVL and provides opportunities to expand the use of wood material in construction.
- Sustainability services for customers, including the use of LCA information and other background information in material choices, as well as technical services for improving material efficiency.

Metsä Fibre

Main products

Pulp and side streams from chemical pulping (for example crude biomethanol, tall oil, turpentine) and bioenergy and sawn timber

Examples

- Pulp produced at the Äänekoski bioproduct mill has about 30 % smaller carbon footprint compared to the European average in pulp production**.
- Pulp producing mills and sawmills provide an industrial platform for cooperation. Industrial symbiosis is developed continously, which increases resource efficiency and enables the utilisation of side streams in new products. For example, a demo plant for lignin refining in connection with Äänekoski bioproduct is under construction and will be completed in 2025. Development of the lignin product for end-use applications to substitute current fossil-based alternatives in the construction sector is being carried out in cooperation with a potential customer.
- In construction applications, sawn timber products store bio-based carbon for a long time.

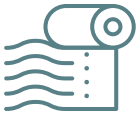
Metsä Board

Main products

Fresh fibre paperboards for packaging (folding boxboards, food service boards and white kraftliners)

Examples

- Metsä Board's lightweight paperboards produced using mainly fossil-free energy have in many applications a lower carbon footprint than the average industry products made from other paperboards***
- As a part of the 360 Services concept, packaging design services and related packaging life-cycle calculations help customers improve recyclability and material efficiency and lower the carbon footprint of their packaging.
- Collaboration with customers also focuses on supply chain optimisation and resource efficiency in paperboard conversion.
- Excellence Centre in Äänekoski offers an active collaboration hub for the research, innovations and testing of packaging materials and solutions. In the packaging design phase the recyclability of the packaging solution can be optimised, and its carbon footprint minimised.
- Paperboard is recyclable (EU recycling rate is 83%, 2022, Eurostat), and it can help reduce the use of fossil-based plastics.



Metsä Tissue

Main products

Tissue and greaseproof papers produced from fresh fibre. Metsä Tissue's brands are Lambi, Serla, Mola, Tento, Katrin and Saga.

Examples

- The strategic choice is to produce tissue papers primarily from wood-based fresh fibre: using fresh fibre instead of recycled fibre offers benefits in Metsä Tissue's production in terms of both water and energy use. Moreover, less waste is generated. For example, the carbon footprint of a Lambi toilet paper roll produced from Äänekoski pulp at the Mänttä mill is about 45 % lower than that of an average corresponding roll produced in Europe and made from recycled fibre.**** In Germany, a tissue paper product made from pulp from the Äänekoski bioproduct mill is being test marketed to enable customers to benefit from the good life-cycle assessment results and environmental advantages of Äänekoski pulp.
- The aim is to manufacture all products as close to the market as possible and to minimise the unnecessary transport of typically lightweight, airy and space-consuming tissue paper products. More than 90 % of deliveries are transported within a radius of 500 km from the mills.
- In 2024, Finnish and Swedish operations switched to biofuels instead of fossil fuels in most transports organised by the company itself

*Life-cycle analysis carried out by AFRY (GWP-fossil) , critical third-party assessment by RISE (Research Institutes of Sweden) and Ramboll. LCA report available on request.
****LCA analysis** carried out by Fraunhofer Institute for Microstructure of Materials and Systems (IMWS), critical third-party assessment by Merseburg University of Applied Sciences and Helmholz-centre for Environmental Research
***** LCA analysis** carried out by Metsä Board and critical third-party assessment by IVL, Swedish Environmental Research Institute
****** Life-cycle analysis carried out by AFRY (GWP-fossil), critical third-party assessment by RISE (Research Institutes of Sweden) and Ramboll. LCA report available on request

Climate benefits from R&D&I activities

Metsä Group conducts long-term research, development and innovation activities in all its business areas.

In R&D&I activities, reducing greenhouse gas emissions in the company's own production and value chain is at the core of all major themes, which are:

- Sustainable procurement of northern wood and the circular economy: the goal is to reduce emissions in the wood supply chain and develop ways to improve forests' climate resilience
- Value-added products and services from northern wood: the goal is to reduce own and customers' Scope 3 emissions by developing ways to transition away from fossil-based chemicals and packaging materials, as well as to develop new wood-based products that can replace fossil-based products
- Sustainable industrial efficiency: the goal is to reduce Scope 1 and Scope 2 emissions for example by increasing the resource efficiency of production to minimise greenhouse gas emissions per product tonne.

In 2024, Metsä Group's research and development expenses totalled 54.3 million euros.

Significant R&D&I efforts focus on the 2030 target of replacing fossil-based raw materials and packaging materials with fossil-free alternatives in Metsä Group's own production. Some of the R&D&I activities aim to developing a new product.

R&D&I activities are carried out in partner networks

R&D&I work is carried out in close collaboration with research and technology organisations, universities, external R&D service providers, technology suppliers, customers, suppliers, growth companies, and other partners. For example, the partnership agreements with the University of Oulu and the University of Helsinki aim at long-term research collaboration, which is carried out in separate coordinated project entities. Metsä Group participates also actively in EU research and development networks (see appendix C in the end of the document).

Metsä Group's key R&D&I activities focused on the 2030 target aiming to 100 % fossil-free raw materials and packaging materials in own production

Fossil-based raw material or packaging material in use	Potential alternatives	Activities in 2024
Phenol formaldehyde resins used in LVL and plywood products	Resins based on lignin, or other biocomponents.	R&D projects with partners, discussions with suppliers, mill trials with new resin formulations.
Latexes used in paperboard products	Various natural polymers and modified natural polymers, as well as bio-based synthetic polymers based on mass balance	Participation in publicly funded research projects, development work in company's own laboratory, pilot and mill trials.
Wet strenght resins used in tissue paper production	Same as above	Several R&D projects with research partners and suppliers, including including projects with theses outcomes.
Barrier materials used in paperboard products	Same as above	Participation in publicly funded research projects, development work in the company's own laboratory, pilot test runs with fossil-free alternatives, development work to reduce the amount of barrier materials.
Wrapping materials used in the packaging of sawn timber, engineered wood products, paperboards and tissue paper products	Wrapping materials containing recycled plastic and/or bio-based plastic. New types of flexible paper wrappings.	Comparison of the carbon footprints and technical performance of different wrapping materials, development project on reducing packaging, supplier discussions.

Examples of Metsä Group's own R&D&I activities aimed at developing a new product

Product to be developed	Product description	Estimated climate impact	Development phase
Muoto™ 3D fibre products for packaging applications	A moulded fibre-based packaging solution produced from Metsä Group's wood-fibre raw materials using novel technology. Recyclable with paper and paperboard packaging waste.	Life-cycle analysis shows* that resource-efficient production utilizing fossil-free energy leads to good carbon footprint results. A versatile alternative based on renewable raw material to plastic packaging.	In the autumn of 2024, the innovation company Metsä Spring began pre-commercial sales of Muoto™ packaging. A demo plant in Äänekoski, pre-engineering of the first commercial mill is underway. The aim is to construct the mill at Metsä Group's Rauma site, where there is already a pulp producing mill and a sawmill that started its operation in 2022.
Kuura™ textile fibre	Kuura fibre is produced from Metsä Group's paper grade pulp using a direct dissolution process (i.e., regenerated cellulose fibre). Production is integrated in a bioproduct mill that produces both pulp and renewable energy.	Life-cycle analysis shows** that resource-efficient production utilizing fossil-free energy leads to good carbon footprint results. Kuura fibre can replace synthetic fibres such as polyester and materials such as cotton, the production of which consumes a lot of water.	Demo plant in Äänekoski. The prefeasibility study for a mill producing Kuura fibre. is underway, after which the project can proceed to a more detailed pre-engineering phase
Light Fibre Material	The Light Fibre Material can be used as protective or padding material or in interior design. Due to its technical properties, the material can be shaped and used in combination with other materials.	The material can replace alternatives such plastic made from non-renewable raw materials. The goal is to develop the material to be fully bio-based and recyclable.	The product is in the development phase. The product's properties are being further developed for the selected applications.
Oxidised lignin	A new bio-based chemical produced from pulp production side streams in a process that is integrated into a bioproduct mill.	The product can substitute chemicals made from fossil-based raw materials such as concrete plasticisers and other dispersants.	A demo plant is being constructed in connection with the Äänekoski bioproduct mill, and it is scheduled to start up in late 2025. The demo plant has a daily capacity of 2 tonnes of the lignin product.
Liquefied bio-based carbon dioxide	Liquefied and purified wood-based carbon dioxide produced from the flue gases of the bioproduct mill's recovery boiler and/or lime kiln.	Wood-based carbon dioxide is an important raw material in the hydrogen economy's products, and it can replace fossil-based carbon sources in the production of liquid fuels and various chemicals and plastics, for example. The long-term storage of bio-based CO_2 in products or geological formations serves as a technical carbon sink.	Concept development underway with partners. The aim is to validate the process concept on a pilot scale at Metsä Group's mill site in Rauma in 2025.

*Life-cycle analysis of Muoto product carried out by AFRY (GWP-fossil),critical third-party assessment by RISE (Research Institutes of Sweden). LCA report available on request.
** **Life-cycle analysis** of Kuura textile fibre carried out by Etteplan, critical third-party assessment by RISE (Research Institutes of Sweden).

Innovation company Metsä Spring

Metsä Group's innovation company Metsä Spring maps and develops potential new businesses for Metsä Group. This role also involves active collaboration with start-up companies. In 2021, Metsä Spring's role was expanded by establishing a Group-level R&D&I function in Metsä Spring. Its aim is to support and promote research, development and innovation in Metsä Group's current business areas

Metsä Spring invests in start-up companies and projects to develop new uses for northern wood. The target companies develop products that substitute alternatives made from non-renewable raw materials, thus helping the chemical and materials sector reduce the use of fossil-based raw materials. Many of the companies use Metsä Group's side streams.

Metsä Spring has two demo plants in Äänekoski, where it produces Kuura™ textile fibre and Muoto™ packaging. The development of both products is based on resource-efficient production utilizing fossil-free energy. This is reflected in the products' carbon footprint results.

The Kuura fibre has achieved the highest "Green shirt" rating in the annual Hot Button Ranking of Canopy, a nonprofit environmental organisation, every year since 2021. In 2024, a prefeasibility study was started. In the study the required investment for a commercial mill and the profitability of the business concept will be analysed. After the prefeasibility study the project can proceed to a more detailed pre-engineering stage. If the textile fibre mill were to be integrated into Metsä Group's bioproduct mill, its renewable energy and material cycles could be utilised in the production process. Japanese Itochu Company, who acts as Metsä Group's partner, has explored the international markets' interest in the Kuura fibre.

Muoto products are moulded fibre-based packaging suitable for takeaway trays, berry boxes or packaging trays, for example. In the autumn of 2024, Metsä Spring initiated pre-commercial sales of Muoto packaging. Alongside this work, the production line's development and testing are continuing in Äänekoski, as is the pre-engineering project of the first commercial mill. The project aimed at developing Muoto packaging business was very highly rated in the European Commission's evaluation process, and the company was invited to negotiate on potential co-financing from the European Innovation Fund for the first commercial Muoto mill planned in Rauma, Finland. Metsä Group can consider investing in the Muoto mill possibly as early as 2025.

Start-ups in Metsä Spring's investment portfolio*

Startup	Main product	Estimated climate impact	Development phase	Timing of Metsä Group's investment	Connection to Metsä Group
Woodio	100 % waterproof wood composite material and products for bathroom and kitchen furniture.	According to the LCA** commissioned by Woodio, the carbon footprints of its products are 30-50 % lower than those of traditional ceramic or stone-based alternatives.	Commercial production unit under construction in Lahti, estimated start-up in 2025	2019	Uses the small wood chips generated as a side stream in Metsä Group's production as its raw material. Otherwise, the chips are combusted and used as bioenergy.
Innomost	Bio-based ingredients refined from birch bark, which provide properties such as water repellency and white pigment to products and replace fossil-based microplastics.	Helps reduce the use of fossil-based raw materials in cosmetics, hygiene products, adhesives, coatings and paints.	Commercial demo plant operating in Kokkola.	2021	Uses birch bark generated as a side stream in Metsä Group's production as its main raw material.
Boreal Bioproducts	Bio-based ingredients refined from spruce sawdust and other wood-based side streams. The ingredients provide surface protection and emulsifying properties.	Helps reduce the use of fossil-based raw materials in cosmetics and chemical industry products, for example.	Commercial pilot facility operating in Turku. Under planning an investment in a commercial production facility in connection with Metsä Group's Vilppula sawmill.	2021	Uses spruce sawdust generated as a side stream in Metsä Group's production as its main raw material.
Fiberwood	Bio-based insulation and padding materials for construction and packaging applications.	Can replace materials such as mineral and glass wool; helps reduce the use of non-renewable raw materials.	A demo plant is under construction in Järvenpää.	2023	Uses wood-based side streams from Metsä Group's production as raw material.
Finecell	Ingredients based on microcellulose and nanocellulose, which can be used as thickeners, emulsifiers or stabilisers, for example.	Helps reduce the use of non-renewable raw materials in paints and hygiene products, for example.	Laboratory-scale production in operation in Stockholm.	2023	Uses pulp produced by Metsä Group as its raw material.
Adsorbi	Pulp-based adsorbent material for air purification and odour removal.	Replaces activated carbon; according to LCA study, many activated carbon production processes have a significant environmental footprint***	Laboratory-scale production in operation in Gothenburg. The launch of pilot production is being planned.	2023	Uses pulp produced by Metsä Group as its raw material

* Situation in Q4/2024

** Woodio Sustainability Report

*** Environmental impact of activated carbon production from various raw materials

Developing the technical capture of wood-based carbon dioxide

Wood-based carbon dioxide is an untapped raw material, and its capture and storage can serve as a technical carbon sink. Metsä Group is exploring possibilities to construct a facility capturing wood-based carbon dioxide in connection with one of its bioproduct mills. Bio-based carbon dioxide, i.e., bio-CO_2 is an important raw material in the hydrogen economy's products, and it can replace fossil-based carbon sources in the production of various chemicals, liquid fuels and plastics, for example.

In the process examined by Metsä Group, carbon dioxide is captured from the recovery boiler's and lime kiln's flue gases. The recovery boiler and lime kiln are part of the recovery process of chemicals in chemical pulping. They are an essential part the bioproduct mill producing pulp and other bioproducts, in which wood raw material is used according to the cascading principle*.

The carbon capture process will be piloted in Metsä Group's Rauma mill area in 2025.

Metsä Group's surveys indicate that upgraders are interested in facilities that produce sufficient volumes of carbon dioxide. In Finland Metsä Group has such mills in Rauma, Joutseno, Äänekoski and Kemi, and in Sweden in Husum.

If technical carbon capture proves viable, it will provide the forest industry with a new high-volume wood-based raw material. Overall, approximately 12 million tonnes of wood-based carbon dioxide is generated annually at Metsä Group's production units.

* The utilisation of wood biomass by maximising its economic and environmental added value

Reduction of Scope 3 emissions

Scope 3 emissions account for approximately 84 % (2024) of Metsä Group's total greenhouse gas emissions. Currently, Metsä Group's focus concerning Scope 3 are emissions from logistics purchased by the Group, and the aim is a 30 % reduction in emissions calculated per tonne-kilometre by 2030. One key area of development is to increase the share of supplier-specific emission data in Scope 3 calculations.

Suppliers are required to commit to Metsä Group's Supplier Code of Conduct or to their own equivalent codes. In the Supplier Code of Conduct, suppliers are encouraged to set reduction targets for greenhouse gas emissions, for example, in accordance with the principles of the Science Based Targets initiative, and to continuously improve their environmental performance and efficient energy use. Suppliers are required to adopt a certified environmental management system where applicable. The collaboration with suppliers is also regularly evaluated through an anonymous survey.

Metsä Group has in place joint sustainability targets with many of its core suppliers. Many of the targets are related to climate (see p. 49).

Reducing emissions from wood supply

In 2023, Metsä Group drew up a roadmap for reducing fossil-based emissions from wood supply and initiated related development action. The aim is to reduce fossil carbon dioxide emissions from wood supply in Finland by 30 % from the 2022 level. In wood logistics, the company is developing solutions based on electricity and biogas. To reduce fossil carbon dioxide emissions, Metsä Group has launched a pilot project testing the use of electric lorries in wood transports between the Kemi bioproduct mill and wood terminals. In addition, charging infrastructure for electric lorries is being built at the Kemi bioproduct mill. Entrepreneurs are encouraged in various ways to switch to lorries running on fossil free-fuels.

Metsä Group and Risutec have jointly developed an accessory with which forwarders can prepare soil while harvesting logging residue. Having the same forwarder harvest logging residue and prepare the soil avoids one machinery transfer stage. This reduces emissions across the wood supply chain.

As of spring 2024, Metsä Group's contract entrepreneurs have been using the Phlebiopsis gigantea fungus for stump treatment and bio-based or biodegradable oil to lubricate harvesters' saw chains. Switching to bio-oils and biological disinfection treatment reduces fossil carbon dioxide emissions from harvesting.

Reducing emissions from logistics

Metsä Group's products are transported to about 120 countries by road, rail and sea. Wood is the main transported raw material and in addition raw materials such as chemicals, binders and pigments are transported to mills. This requires an extensive logistics network. Some logistics suppliers have in place a common emission reduction target with Metsä Group. Emissions from logistics are reduced for example by optimizing routes, minimizing transport distances and optimizing payloads. In the Kemi bioproduct mill and Rauma sawmill, which are new investments, the payload of transport units has been maximized, and fossil-free fuels are favored in product transports from mills to ports.

Metsä Group's joint climate related targets with core suppliers

Target area	Toimittaja	Common climate related target
Emissions from wood supply (sea transport in the Baltic Sea region)	Navalis Shipping	The common goal is to reduce Metsä Group's wood supply's carbon dioxide emissions related to sea transport in the Baltic Sea region by 30 % (per tonne/mile) from the 2022 baseline by 2030.
Emissions from wood supply (sea transport in the Baltic Sea region)	AtoB@C Shipping	The common goal is to reduce Metsä Group's wood supply's carbon dioxide emissions related to sea transport in the Baltic Sea region by 30 % (per tonne/mile) from the 2022 baseline by 2030.
Rail transport (wood raw material and products, including mechanical wood products, pulp and paperboard)	VR Group	The joint target is to halve emissions from transports included in the cooperation by 2030. For Metsä Group, the measures would represent a total annual emission reduction of around 14,000 tCO_2e. Metsä Group and VR have set up a joint working group to define tangible measures to achieve the target. The measures are related for example to the electrification of the rail network, more efficient train concepts and the use of diesel made from renewable raw materials.
Sea transport (raw materials such as chemicals and products including mechanical wood products, pulp and paperboard)	Royal Wagenborg	The common goal is to reduce the carbon dioxide emissions from the sea transport of Metsä Group's products by 30 % (per tonne/mile) from the 2021 level by 2030. Metsä Group and Royal Wagenborg have set up a joint working group to define tangible measures to achieve the target. The measures are related for example to the technical and operational activities of the Wagenborg fleet, including route optimisation, fleet development and use of new vessel types.
Fossil-free raw materials	Kemira	The goal is to jointly develop a new fossil-free product or raw material related to the forest industry by 2027. Metsä Group and Kemira have set up a joint working group to promote the target.
Technology procurement	Andritz	The goal is to jointly reduce Scope 3 emissions. The aim of the multi-year cooperation is to increase the effectiveness of emissions reductions and to find completely new ways to reduce greenhouse gas emissions. The companies have established a project team to define the most significant development areas, indicators and targets for reducing the value chain's total emissions.

Other examples of measures and collaboration for reducing Scope 3 emissions

In 2024 Metsä Group explored the supply chain's plans and readiness for emissions reductions in cooperation with 22 suppliers and six customers.

Metsä Group collaborates actively to develop the recyclability and collection and recycling infrastructure of fibre-based packaging. For example, Metsä Group is a member of the 4evergreen alliance, which has developed common guidelines for the value chain on packaging design and recyclability testing. The common aim is to increase the recycling rate of fibre-based packaging to 90 % by 2030 (in the EU, the recycling rate was 83.2 % in 2022, according to Eurostat).

Together with customers Metsä Group is developing the reuse of construction wood products. For example, due to the renovation of Finlandia Hall in Helsinki, a temporary wooden facility known as Little Finlandia was constructed in 2022. Little Finlandia complies with the principles of circular economy, as it is made of modular and reusable wooden modules featuring Metsä Group's Kerto® LVL products. When the temporary facility is no longer needed, the building can be moved to a new place and made into a day care or school building, for example.

Metsä Group's 2030 target to aim for 100 % fossil-free raw materials and packaging materials in own production also aims to reduce Scope 3 emissions.

Societal dialogue and advocacy

In advancing the sustainability transition and related climate work collaboration and dialogue play a key role. Metsä Group engages in wide-ranging discussions with representatives of the public sector, policymakers, local communities and NGOs. The Group's active collaboration with academic operators and research institutions is described in the chapter on R&D&I activities and in appendix C.

Metsä Group has in place an operating model for stakeholder engagement and related management processes. Stakeholder feedback plays an important role, and stakeholders are also engaged in the sustainability materiality assessment. Of indigenous peoples, the Sámi are affected by Metsä Group's operations especially in the context of wood supply. The aim is to diversify the means of engagement and harmonise the scope and frequency of engagement with various stakeholders. For example, in 2024, Metsä Group launched the Collaboration Day concept to strengthen the interaction. The theme of the first event was regenerative forestry and land use, and it was attended by about 100 participants from Finland. In future Metsä Group will organize the Collaboration Day at least once a year.

In 2023, Metsä Group launched a multiannual action plan to create biodiversity plans for each mill site. This concept of regenerative land use includes close interaction and collaboration with local communities. The first pilot project has been carried out in the Kemi bioproduct mill area (see page 30). Metsä Group participates in advocacy at the EU and national level, especially in Finland, Sweden and Germany. Metsä Group aims to introduce views that promote regenerative forestry and land use and accelerate the circular bioeconomy, as well as the recognition and utilisation of the climate benefits of renewable carbon. Metsä Group supports the EU's environmental goals and the target of climate neutrality by 2050.

Metsä Group collaborates via membership of various organisations, including trade and industry associations, 4evergreen, the Biobased Industries Consortium (BIC), and the Ellen MacArthur Foundation.

Metsä Group's President and CEO, supported by the Group's Executive Management Team, determines the priorities of political influence for all business operations and monitors the progress made in them. Metsä Group's corporate affairs function coordinates practical influence work, handling the related cooperation among the Group's business operations and other functions, and reporting the work's progress and effectiveness to Group management and the Board of Directors.

In 2024 Metsä Group published its position papers on regenerative forestry and the crucial role of renewable carbon in achieving the EU climate neutrality target and developing industrial carbon management. The position papers are published on Metsä Group's website. The aim is to conduct proactive and transparent, fact-based climate advocacy work. Metsä Group's parent company Metsäliitto Cooperative is registered in EU's and Finland's Transparency Registers and complies with their code of conducts. The register number in the EU Transparency Register is 962687110415-94 and in Finland's national Transparency Register MET-24-399-R.

Industry sector's common national climate roadmap and biodiversity roadmap

The industry sector's first joint national climate roadmap was published in 2020 under the leadership of the Finnish Forest Industries Federation. The roadmap was compiled on the initiative of the Finnish Ministry of Economic Affairs and Employment as part of the 2035 climate neutrality target set by the government. The roadmap outlines forest industry's role in achieving the target. Surveys concerning forestry and forest industry production and the climate impact of products were used as background material. Research institutes and other partners carried out the surveys. The update of the forest industry's national climate roadmap will be completed in 2025.

With the climate roadmap scenarios, the industry sector wants to highlight the opportunities provided by the sector's development, as well as to present tangible measures for reducing fossil-based carbon dioxide emissions, improving forest growth and adaptation to climate change, and producing products that store bio-based carbon and replace emission-intensive products.

In 2023, the industry also prepared a joint biodiversity roadmap under the leadership of the Finnish Forest Industries Federation and the Finnish Sawmills Association. The biodiversity roadmap is a report based on scientific research by the wood processing community on the state of forest nature, the impacts of long-term biodiversity work in the forest sector to date, and a modelling of the future development of forest nature. It is also a joint commitment to promote the highlighted developments.

Metsä Group is a member of the Finnish Forest Industries Federation and participates actively in the industry's joint roadmap work in the fields of both climate and biodiversity.

4. Good governance provides stability and a long-term perspective

Metsä Group's Executive Management Team approved the Climate transition plan in 2024. The plan was also communicated to Metsäliitto Cooperative's Board of Directors.

Committed management and clear processes

Metsäliitto Cooperative's Board of Directors is the entire Group's highest body overseeing sustainability. Sustainability, including climate targets and actions, is incorporated into the Group's business strategy approved by the Board of Directors, as well as in long-term business and investment plans, risk assessments, and annual action plans. The Board of Directors also approves Metsä Group's strategic sustainability targets and their updates. Metsä Group's President and CEO is responsible for the implementation of the targets. The progress made in targets is regularly reported to the Board of Directors every quarter.

There is a Group-level process concerning sustainability management, which is overseen by the Sustainability Process Management Team. Its main task is to ensure that the sustainability objectives are reflected in the business areas' processes and action plans. The sustainability process management team monitors progress in the strategic 2030 sustainability targets and ensures the consistency of sustainability work across the Group. It consists of business area representatives and function heads who are responsible for ensuring that the sustainability objectives are implemented in their organization. The work of the sustainability process management team is supported by a network of sustainability experts from the entire Group, which meets regularly under the lead of Metsä Group's sustainability director.

Remuneration of the Board of Directors, the President and CEO, and the Executive Management Team

At Metsä Group, remuneration is based on the following principles:

- Ensuring sustainable and responsible business operations
- Ensuring performance and profitable growth
- Supporting competence development and renewal
- Consistency, competitiveness and transparency.

Metsäliitto Cooperative's Board of Directors decides on the remuneration and other financial benefits of the Group's President and CEO and the members of the Group's Executive Management Team employed by Metsäliitto Cooperative, as well as on the principles of the short and long-term remuneration systems based on the HR Committee's preparation. The remuneration of Metsäliitto Cooperative's Board of Directors is not tied to Metsä Group's performance. Further information on remuneration in 2024 is presented in Metsä Group's annual review.

Process for managing climate risks

Metsä Group uses the company-level risk management process to identify sustainability-related impacts, risks and opportunities, and to assess their materiality. The risk management process complies with the COSO Enterprise Risk Management methodology. The key goal is to identify and assess the risks, threats and opportunities potentially significant to the implementation of the company's values and strategy and to the achievement of long-term targets, as well as to identify and assess the company's impacts on society and the environment. In addition to the company's own operations, the identification and assessment of impacts, risks and opportunities encompasses the upstream and downstream value chain and any other parties that the company's operations affect.

Ensuring undisturbed and uninterrupted operations in all conditions is key in the risk assessment of production units. The assessment process of production units' environmental risks is guided by the ISO 14001 and ISO 50001 management systems. ISO 14001 also guides the assessment and identification of risks in wood supply.

Double materiality assessment as a part of risk management

As part of its risk management process, Metsä Group regularly carries out a double materiality assessment of all its operations, in which the impacts, key risks and opportunities of operations are also assessed. The results of the materiality assessment and the general annual risk assessment process guide the management of sustainability risks in the Group. Metsä Group's internal control unit monitors and reports on sustainability risks to business operations, the Executive Management Team and Audit Committee in accordance with the Group's general internal control governance model and the annual cycle. The control of sustainability risks is planned, described and implemented on a risk basis in business processes, and it is carried out in accordance with the company's general model for internal control.

Making use of the climate risk analysis

Key climate and other ESG risks are accounted for in the business operations' planning processes, and management measures are drawn up to prepare for the risks. In addition, the Metsä Group's Executive Management Team reviews the most significant risks as part of its executive management work. The risks identified and their management are reported to the Board of Directors twice a year. At their meetings, the Board of Directors and Board Committees regularly discuss reviews related to different areas of sustainability, presented by the Group's executive management and experts. The reviews offer Board members information about the material impacts, risks and opportunities related to the company's sustainability, and of the progress made in the company's sustainability targets. The reviews also ensure the Board's understanding and competence are up to date in sustainability matters.

The main results of the 2024 climate risk analysis and the risk management actions are presented on pages 8-10. The results and the risk management process are discussed more comprehensively in Metsä Group's annual review.



Building employees' climate capabilities

All Metsä Group employees complete an online course on the basics of sustainability. Climate themes are a key element of the online course. Since 2023, sustainability has been part of every Metsä Group employee's annual personal targets. Peer learning and the sharing of best practices are encouraged as part of the strategic development of a unified Metsä Group. The principle of continuous development and improvement guides all operations.

The development of core competencies that are of key importance for the Group is an important part of the implementation of Metsä Group's strategy. Metsä Group's Academy training concept has been developed to meet this need. In 2023, academies for sales, procurement and sustainability were launched alongside the previously launched finance academy. In addition, the leadership programmes that jointly form the leadership academy have been revised in recent years. Climate-related topics are at the core of the Sustainability Academy, and they are also included in the themes of all the other academies and leadership programmes.

> Building the climate capabilities of employees is an important part of Metsä Group's climate work.

Opportunities for further training and collaboration are offered for example through Metsä Group's membership in the UN Global Compact, the FIBS corporate responsibility network and the Ellen MacArthur Foundation's circular economy network. Metsä Group also organises training and events including climate topics for customers, contract partners and Metsäliitto Cooperative's owner-members.

Appendix A

Calculation of greenhouse gas emissions at Metsä Group

The calculation and reporting of greenhouse gases is done in accordance with the GHG protocol (GHG Protocol Corporate Accounting and Reporting Standard and Corporate Value Chain (Scope 3) Accounting and Reporting Standard). The results are published annually in Metsä Group's annual review, and they are verified by a third party. The calculation covers direct greenhouse gas emissions (Scope 1) from Metsä Group's own operations, indirect greenhouse gas emissions (Scope 2) from the production of purchased energy, and indirect greenhouse gas emissions from other parts of the value chain (Scope 3), including upstream and downstream. The calculation includes all greenhouse gases covered by the GHG protocol (CO_2, CH_4, N_2O, HFCs, PFCs, SF_6 and NF_3). Emissions are converted to carbon dioxide equivalents.

Scope 1 emissions are calculated from the fuels used by production units. The calculation is based on supplier-specific emission factors for fuels or on national emission factors. Two different methods are used for **Scope 2** carbon dioxide emissions. The market-based method uses supplier-specific emissions factors, supplemented with national residual mix emission factors for untracked purchased electricity. In the location-based method, country-specific average emission factors for electricity are used. The residual mix factors and country-specific factors have been obtained from the AIB (Association of Issuing Bodies) report on emission factors. Metsä Group's emissions reduction target and the related roadmap are based on the market-based method.

Group-level **Scope 3** emissions were first reported for 2022. The calculation includes all the standard's categories except for the following three: Upstream Leased Assets; Downstream Leased Assets; and Franchising. These three categories were assessed to be non-material. In the absence of accurate data, assumptions have been used in the calculation. The emission factors used are mainly from global databases, including ecoinvent 3.9.1, EXIOBASE 3, DEFRA's GHG conversion factors (full set 2022) and IEA's Life Cycle Upstream Emission Factors (2023).

Appendix B

Technical description of Metsä Group's key metrics and targets related to climate

Metsä Group's 2030 sustainability target, "0 tonnes of fossil-based carbon dioxide emissions", concerns **Scope 1** and **Scope 2** emissions and only encompasses carbon dioxide emissions, excluding other greenhouse gases. In other respects, the target has been calculated in accordance with the GHG Protocol. The target does not include buildings outside the mill areas or internal logistics, as their share of emissions is assessed to be non-material. Regarding **Scope 3** the 30 % reduction target in category 4 has been set for GHG emissions calculated per tonne-kilometre. The Scope 3 target is in force from 2025 onwards and the baseline year is 2022.

The amount of forest regeneration and young stand management covers, in hectares, the soil preparation and young stand management, or early cleaning and thinning, carried out by Metsä Group's Wood Supply and Forest Services. **The amount of forest fertilisation** includes, in hectares, the growth, boron and ash fertilisation carried out by Metsä Forest. **The share of continuous cover forestry in peatland forest regeneration** covers Metsä Forest's standing sales, as well as the group selection cutting, selection cutting and strip felling carried out to regenerate peatlands, and it is calculated based on the amount of felling. **The amount of carbon stored in wood products** is calculated for mechanical wood products. The carbon content is calculated using tree species-specific database factors to ensure comparable results between tonnes of wood (CO_2 equivalent).

The amount of fossil free raw materials and packaging materials includes the raw materials and packaging materials of products produced by Metsä Group. The weight of raw materials is converted to dry tonnes using the factors provided by the suppliers. A raw material is considered fossil free if none of its main raw materials contains fossil-based oil. Materials that do not remain in the product, such as process chemicals, are not taken into account in calculation. From 2025 onwards, recycled plastics will also be accepted in the fossil-free target for product packaging materials.

The Energy Efficiency Index is determined as specific energy consumption, meaning the ratio of energy consumption and production volume. Specific energy consumption is calculated for individual production lines, including the consumption of electricity, heat and fuels as megawatt hours (MWh).

The reduction of process water use is calculated in cubic metres per product tonne (m^3/tn)

The target **proportion of certified wood** means FSC and PEFC certified wood. From 2025, the target level will be 100 %.

A more detailed description of all Metsä Group's strategic sustainability 2030 ESG targets is presented in Metsä Group's annual review. The slightly updated targets valid from 2025 onwards have been published on Metsä Group's website.

Appendix C

Summary of climate-related publicly funded R&D&I initiatives in which Metsä Group is involved

Name of the initiative	Goal	Funding provider	Overall budget and duration	Focus of Metsä Group's activity
ACE LIFE – Accelerating Climate Efforts and Investments	The project supports Finland in its goals to halve the emissions of the effort sharing sector by 2030 and achieve climate neutrality by 2035. It especially focuses on the challenges related to emission reductions in agriculture, heavy-duty transport and industrial processes	EU, LIFE instrument	EUR 20 million 2024–2030	Development of fossil-free logistics in wood procurement, including the piloting of eTruck and biogas trucks, with partners.
SteamDry	The aim is to significantly reduce the energy consumption and carbon dioxide emissions of paper and paperboard production. The focus is on a showcase that achieves 60 % savings in thermal drying and 40 % energy savings on the production line, with the potential for up to 100% carbon dioxide emission reduction.	EU, Horizon Europe	EUR 10 million 2024–2027	Large energy savings in paperboard, tissue paper and wood drying processes. Metsä Group evaluates the technical and economic potential of the drying processes developed jointly in the project.
ModelFabrik Papier	80 % reduction in energy consumption in paper production.	The German State	EUR 40 million 2023->	Finding new solutions especially for energy and water use management related to the production of tissue papers and greaseproof papers.
Superbark – Safe, sustainable, and high-performance adhesives and coatings from industrial softwood bark	The project is developing safe, sustainable and high-performance adhesives and coatings from industrial softwood bark. The products will replace fossil-based alternatives.	EU, Circular Biobased Europe Joint Undertaking	EUR 4.7 million 2023–2027	Bark-based adhesives and coatings for engineered wood products, replacing fossil-based products. Metsä Wood tests newly developed products in the project.
ExpandFibre programmes and ecosystem	Accelerating the development of sustainable bioproducts refined from wood or straw, aiming for products with a lower carbon footprint than that of alternatives based on fossil-based raw materials.	Business Finland Veturi-funding	More than EUR 140 million allocated to achieving the goal in the innovation ecosystem 2020-2024	Metsä Group hosted together with Fortum the innovation ecosystem, comprising of over 100 organization members and over 30 individual publicly funded R&D projects. Funding of the ecosystem ended in 2024, a transition phase in progress 2024-2025.

In addition, a steering group role in the following projects aimed at reducing greenhouse gas emissions from production or developing new products with a low carbon footprint: EnergyFirst (EUR 20 million, ERDF), ForestCUMP (EUR 3 million, Business Finland), Susbinco (EUR 10 million, Business Finland), Cocobin (EUR 9 million, Business Finland), Cellight (EUR 2 million, Business Finland), Films for Future (EUR 15 million, European Regional Development Fund), FurBio (EUR 0.6 million. Business Finland), Emission free pulping (EUR 15 million, Business Finland), SmartRecovery (Business Finland), ABiCo (Business Finland).

Growth, with a future

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