# UPM corporate environmental and societal responsibility statement 2024

UPM pulp and paper mills

# About this report

### EMAS reporting at UPM pulp and paper mills

All of UPM's European pulp and paper mills (excluding Caledonian in the UK), as well as the Fray Bentos and Paso de los Toros pulp mills in Uruguay and the Changshu paper mill in China, are registered with the EU Eco-Management and Audit Scheme (EMAS). EMAS is a voluntary environmental management system for companies and other organizations to improve, evaluate and report on their environmental performance annually.

The UPM Corporate Environmental and Societal Responsibility Statement together with the Environmental and Societal Responsibility reports of each UPM pulp and paper mill, comprise the global EMAS statement of UPM Corporate. The statement has been made in accordance with the Regulation (EC) No 1221/2009 of the European Parliament and of the Council, the EU's Eco-Management and Audit Scheme (EMAS).

Since 2017, societal responsibility indicators have been included in all mill supplements. UPM considers it important to report all impacts generated at mill locations, whether environmental or societal.

The information within the corporate part concerning the below-mentioned sites, as well as the information used to calculate the UPM corporate-level EMAS core indicators, has been assessed and verified by the respective national EMAS auditor.

The current EMAS corporate part is fully updated and available alongside the mill supplements at upm.com.

The next Corporate Environmental and Societal Responsibility Statement will be published in 2026.

### Corporate responsibility reporting at UPM

At UPM, the environmental and corporate responsibility reporting is integrated with the company's annual reporting. The UPM Annual Report includes UPM's disclosure in accordance with the EU CSRD (Corporate Sustainability Reporting Directive).

For the Annual Report, please visit **upm.com/annualreport**.

### Scope of the report

This statement forms the corporate part of the environmental and societal responsibility statement. The following sites are included in the EMAS scope:

- UPM Augsburg
- UPM Changshu
- UPM Fray Bentos
- UPM Jämsänkoski
- UPM Kaukas
- UPM Kymi
- UPM Nordland Papier
- UPM Paso de los Toros
- UPM Pietarsaari
- UPM Rauma
- UPM Schongau
- UPM Tervasaari

Corporate registration number: FI-000058

### Information about sites without EMAS registration

The UK site, UPM Caledonian, as well as the non-European site, UPM Blandin, are not EMAS registered. Information about these sites has not been assessed or verified in an EMAS context.

### UPM

UPM is a material solutions company, renewing products and entire value chains with an extensive portfolio of renewable fibres, advanced materials, decarbonization solutions, and communication papers. Our performance in sustainability has been recognized by third parties, including EcoVadis and the Dow Jones Sustainability Indices. We operate globally and employ approximately 15,800 people worldwide, with annual sales of approximately €10.3 billion. Our shares are listed on Nasdaq Helsinki Ltd.

UPM – we renew the everyday
**upm.com**

# Contents


**About this report** 1

**UPM in brief** 3
UPM's pulp and paper mills 5
Products 6

**Environmental performance** 7
Environmental targets 8
Environmental development 9
Environmental core indicators 13

**Societal performance** 17
Societal development 18

**Environmental management** 20

**Manufacture of pulp and paper** 23
Manufacturing of mechanical pulp 24
Manufacturing of chemical pulp 25
Manufacturing of recycled fibre pulp 26
Manufacturing of paper 26
Schematic 27
Wastewater treatment 28

**Raw materials, energy and logistics** 29
Fibre raw materials 30
Pigments and additives 32
Energy 33
Logistics 34

**Environmental impact** 35
Environmental impacts 36
Air 38
Water 39
Waste 40

**Appendices** 41
UPM Sustainability Policy Statement 42
Glossary 45
Validation statement 47
Mill contacts 48

# UPM in brief


UPM in brief 4

UPM's pulp and paper mills 5

Products 6


Over the years, the company has reported the environmental impacts of its pulp and paper mills in Europe, China and Uruguay according to the EU Eco-Management and Audit Scheme (EMAS). Today the reports also provide a thorough analysis of the company's societal impact at a local level.

# UPM – a material solutions company

UPM contributes to the sustainable transformation of society with material solutions, utilizing renewable feedstocks. We create long-term value through our extensive portfolio of renewable fibres, advanced materials, decarbonization solutions and communication papers, collaborating with industries and brands worldwide.

We are committed to creating value for our customers, using sustainable, renewable feedstocks, reducing our own environmental footprint and enhancing our positive societal impact.

We are among the global sustainability leaders. We comply with international standards and are committed to respected global initiatives. We raise the bar through science-based action and verify the results with third-party when possible.

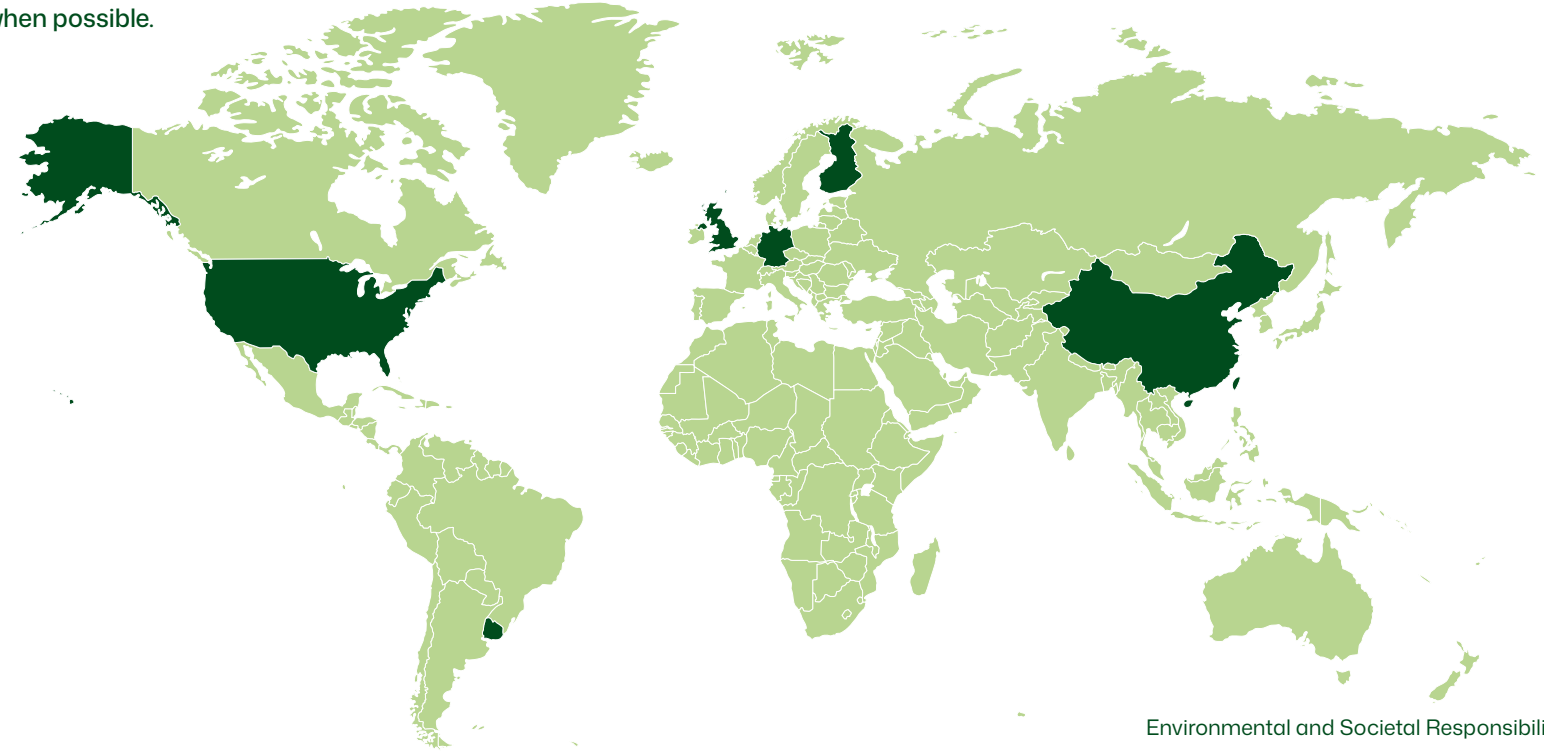
## Pulp

UPM Pulp has three mills in Finland and two in Uruguay. to serve the global market with a capacity of 5.8 million tonnes of sustainably produced eucalyptus, birch and softwood pulp grades for a variety of end uses. Our pulp mills also produce wood-based renewable energy, as well as by-products and residues used for innovative bio-products.

Pulp is a biodegradable raw material with many applications, including packaging materials, various types of papers, hygiene products, textiles and binders for cosmetics, pharmaceuticals, food and paints.

## Paper

We have one UPM Specialty Papers' production unit in China, one in Germany and two in Finland, with the combined production capacity of 2.0 million tonnes. UPM Specialty Papers offers specialty packaging materials for flexible packaging, labeling and industrial release liners, as well as office and graphic papers in the Asia-Pacific region. We have 9 UPM Communication Papers' production units in Europe (Finland, Germany and the UK) and one in the USA, with the combined production capacity of 4.3 million tonnes. UPM Communication Papers offers a wide range of magazine papers, newsprint and fine papers for advertising and publishing, as well as for home and office use. The decline in paper demand has been predictable and steady in recent years.



# Profiles of UPM pulp and paper mills

| | Environmental management system | | Quality management system | Health & safety system | Energy management system | Food safety management system | | | | On-site pulping | | Effluent treatment plant | Power plant and/or boiler | Fuels | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ISO 14001 | EMAS | ISO 9001 | ISO 45001 | ISO 50001 EES+* | ISO 22000 | Paper machines | Paper grades | Chemical pulp grades | Mechanical pulping | Deinking | | | renewable | fossil |
| **Augsburg**, DE | x | x | x | x | x | – | 1 | LWC | – | x | x | municipal | x | – | x |
| **Blandin**, US | x | – | x | x | – | – | 1 | LWC | – | x | – | municipal | x | – | x |
| **Caledonian**, GB | x | – | x | x | – | – | 1 | LWC, newsprint | – | x | – | municipal | x | x | x |
| **Changshu**, CN | x | x | x | x | x | x [3] | 3 | fine (WFU, WFC), label | – | – | – | own | x | x | x |
| **Fray Bentos**, UY | x | x | x | x | x | x | – | – | eucalyptus pulp | – | – | own | x | x | x |
| **Jämsänkoski**, FI | x | x | x | x | x [1] | x [3] | 3 | SC, MFS, newsprint, label, packaging | – | x | x | own | x | x | x |
| **Kaukas**, FI | x | x | x | x | x [2] | x [4] | 1 | LWC | softwood and birch pulp | x | – | own | x | x | x |
| **Kymi**, FI | x | x | x | x | x [2] | x [4] | 2 | fine (WFU, WFC), label | softwood and birch pulp | – | – | own | x | x | x |
| **Nordland**, DE | x | x | x | x | x | x [3] | 4 | fine (WFU, WFC) | – | – | – | own | x | – | x |
| **Paso de los Toros**, UY | x | x | x | x | x | x | – | – | eucalyptus pulp | – | – | own | x | x | x |
| **Pietarsaari**, FI | x | x | x | x | x | x | – | – | softwood and birch pulp | – | – | own | x | x | x |
| **Rauma**, FI | x | x | x | x | x [1] | – | 2 | LWC | – | x | – | own | x | x | x |
| **Schongau**, DE | x | x | x | x | x | – | 3 | SC, newsprint, MFS | – | x | x | own | x | x | x |
| **Tervasaari**, FI | x | x | x | x | x [1] | x | 2 | label | – | – | – | own | x | x | x |

[1] EES+ certification
[2] EES+ certification for the paper mill and ISO 50001 for the pulp mill
[3] Label and packaging papers
[4] Pulp mill only

* The Finnish authorities responsible for energy savings have developed the Energy Efficiency System EES+. In terms of energy reviews, the EES+ requirements are consistent with the ISO 50001 standard. The EES+ system has been integrated with the ISO 14001-based environmental system at a mill.

LWC: lightweight coated paper
SC: supercalendered paper
WFC/WFU: woodfree coated/woodfree uncoated
MFS: machine-finished specialities

Information on the number of personnel and capacity can be found in the mill supplements (available at **upm.com/sustainability**).
All certificates can be found in UPM's Certificate Finder (available at **upm.com/sustainability**).

# Safe, recyclable products from renewable raw materials

The main raw material for all UPM's pulp and paper products is wood, a renewable natural resource. Paper can easily be recycled and used again. UPM uses recovered paper as a secondary raw material.

The choice of raw material used in paper production depends on the requirements of the end product. Production of different grades is optimized as much as possible according to the availability of raw materials close to UPM mills. Fresh wood is used for grades produced in Finland, for example, while recovered paper is used in densely populated regions in Germany.

## Typical end uses of UPM pulp and paper

| Product group | Examples of end uses |
|---|---|
| Chemical pulp | Household and toilet papers, napkins, tissue, consumer packages, labels, graphic papers, textiles and binders |
| Magazine papers | Magazines, advertising material, catalogues |
| Newsprint | Newspapers, newspaper inserts, supplements |
| Fine papers | Office papers, magazines, books, advertising material, envelope papers |
| Specialty papers | Packaging papers and face and release papers for labels and tapes |

## Product stewardship

Product stewardship has a very broad meaning at UPM. Our dedicated UPM Product Stewardship Standard governs our actions across the entire company and ensures the safety and sustainability of our products. The Standard assigns responsibilities for implementation and compliance to various UPM businesses and functions.

Our sustainable product design approach, part of the UPM Product Stewardship Standard, aims to ensure that our products are sustainable and safe to use, their environmental impacts are minimized, and the social impacts are assessed. In addition, we take all possible efforts to give our products a second life when they reach the end of their life cycle – and that we can prove.

We focus on offering recyclable products that are made from renewable and/or recyclable raw materials. This creates a solid basis for responsible product stewardship. Our products are well suited for recycling thanks to their main raw material – renewable wood. As part of our sustainable product design approach, we actively look for innovative ways to recycle our products at the end of their life.

Our products help to mitigate climate change by replacing fossil-based products with bio-based renewable alternatives. The products store carbon for the entire duration of their life cycle, especially when recycled multiple times. We actively develop circular economy solutions. Our target is also to provide solutions that improve our customers' business processes and performance – creating mutual benefit and societal value.

## Environmental product declarations

Paper Profile is an environmental product declaration scheme developed and provided by leading paper producers (paperprofile.com). It covers key environmental aspects related to pulp and paper production, including product composition, emissions, wood procurement and environmental management. Paper Profiles are available for all UPM paper machine lines.

In addition, UPM provides detailed information about the carbon footprint of its pulp and paper products.

## Environmental labels

UPM pulp and paper products fulfill the criteria for most of the internationally recognized ecolabels. Thus, UPM customers have the option of using a number of different ecolabels. These labels may focus on one part of the supply chain (e.g. FSC™ (FSC C014719) and PEFC (PEFC/02-31-80) forest certification) or span a range of criteria, including raw materials, production processes and final products (e.g. the EU Ecolabel). Please refer to the respective mill supplement for up-to-date information about the availability of environmental labels. All certificates can be found in UPM's Certificate Finder (available at upm.com/sustainability).

FSC www.fsc.org FSC™ C014719 The mark of responsible forestry

PEFC PEFC/02-31-80 Promoting Sustainable Forest Management www.pefc.org

EU Ecolabel www.ecolabel.eu EU Ecolabel : FI/011/001

# Environmental performance


Environmental targets 8

Environmental development 9

Environmental core indicators 13

All process water is treated in mechanical and biological effluent treatment plants before being released into watercourses.

# Environmental targets show direction

UPM's strategy guides us in achieving our sustainability targets for 2030 and contributes positively to the UN Sustainable Development Goals (SDGs).

To guide our sustainability activities, we have established a set of sustainability focus areas with targets and key performance indicators, reviewed annually based on a materiality analysis. We have also identified the SDGs where we can have the greatest impact, either by minimizing our negative impact or by increasing our positive impact. The most relevant SDGs for UPM align with our sustainability focus areas.

In the environmental area, the focus areas are forests, biodiversity, climate, water, waste, and product stewardship. In the social area, the focus areas are continuous learning and development, responsible leadership, diversity and inclusion, fair rewarding, safe and healthy working environment, and community involvement. See the UPM Annual Report for details.

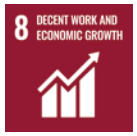
The table below shows UPM's environmental focus areas, key performance indicators, and current Group-level performance in relation to the relevant targets. UPM's pulp and paper mills publish their annual target-setting in the mill supplements. These targets reflect UPM's long-term targets at a local level. In addition, the mill-level targets focus on specific local development areas.

| Environmetal | Key performance indicator | 2030 target | 2024 result (2023) |
|---|---|---|---|
| **Forestry**<br>Ensuring sustainable land use | • Climate-positive land use in UPM's own and leased forests<br>• Share of certified fibre[1] | • Forests as carbon sinks (continuous)<br>• 100% | • Five-year annual average carbon sink was approx. –2.1 Mt of $CO_2$ equivalents<br>• 88.5% (87.0%) |
| **Biodiversity**<br>Enhancing biodiversity | • Positive impact on forest biodiversity and developing a monitoring system[3]<br>• Obstacle-free streams[4] | • Positive development (continuous)<br>• 500 km | • Overall positive development measured in Finland and in Uruguay<br>• 287 km (263 km) reached |
| **Climate**<br>Creating climate solutions and working towards carbon neutrality | • Fossil $CO_2$ emissions from UPM's on-site combustion and purchased energy (Scope 1 and 2), compared to 2015<br>• Coal and peat usage in on-site energy generation<br>• Annual energy efficiency improvement<br>• Share of renewable fuels<br>• Acidifying flue gases ($NO_X$/$SO_X$) for a UPM average product, compared to 2015 | • –65%<br>• 0<br>• 1% (continuous)<br>• 70% (continuous)<br>• –20% | • –50% (–45%) compared to 2015 and –9% compared to 2023<br>• 7% of total fossil fuel usage, +4% compared to 2023<br>• Not achieved<br>• 80% (76%)<br>• –19% (–17%) |
| **Water**<br>Using water responsibly | • Chemical oxygen demand (COD) for a UPM average product, compared to 2008[2]<br>• Wastewater volume for a UPM average product, compared to 2008[2]<br>• Nutrients used at effluent treatment from recycled sources[2] | • –40%<br>• –30%<br>• 100% | • –44% (–39%)<br>• –16% (–7%)<br>• 33% (33%) |
| **Waste**<br>Promoting material efficiency and circular bioeconomy – reduce, reuse, recycle and recover | • Process waste sent to landfills or to incineration without energy recovery | • 0 | • 18% increase compared to 2023, 83% (87%) of UPM's process waste recovered or recycled |
| **Product stewardship**<br>Taking care of the entire life cycle | • Climate-positive product portfolio<br>• Development of new products and services with contribution to the SDGs<br>• Share of applicable products eligible for ecolabelling out of UPM sales | • Continuous<br>• Continuous<br>• 100% | • Decarbonization solutions: 8% of sales<br>• For example, UPM Solargo™, a new range of bio-based plant stimulants<br>• 89% (89%) |

[1] Forest management certification [2] Relevant for pulp and paper production [3] Covers UPM's own forests in Finland and UPM's land in Uruguay [4] Relevant for Finland

Goal 6:
Clean water and sanitation (Target: 6.3)

Goal 7:
Affordable and clean energy (Targets: 7.2 and 7.3)




Goal 8:
Decent work and economic growth (Targets: 8.2, 8.5 and 8.8)

Goal 12:
Responsible consumption and production (Targets: 12.2, 12.4 and 12.5)

Goal 13:
Climate action (Target: 13.1)

Goal 15:
Life on land (Targets: 15.2 and 15.5)

# Environmental development – Pulp

Our annual pulp production capacity of 5.8 million tonnes is produced in Finland and in Uruguay. The highlight of 2024 was the successful ramp-up of the UPM Paso de los Toros pulp mill. The mill reached full production capacity of 2.1 million tonnes.

In 2024, global demand for chemical pulp was robust, and UPM's deliveries increased significantly with the completion of the ramp-up of the Paso de los Toros pulp mill in Uruguay. Demand for chemical pulp was lower in China and solid in other main markets. Demand varied depending on the end-use in all the main markets.

## Fibre sources

In 2024, 83% of the wood used for pulp production came from FSC™ and/or PEFC certified forests, and the rest came from controlled sources.

## Energy

UPM's pulp mills are more than self-sufficient in energy usage, providing surplus heat for the integrated paper mill or to external parties and surplus electricity to the grid. The share of renewable energy remained on a good level at 93%.

## Air

In 2024, specific emissions of fossil carbon dioxide from own fuel usage (Scope 1) increased slightly and from purchased electrity (scope 2) decreased slightly. Nitrogen oxide and sulphur dioxide remained in the same good level as well as emissions of particulates and total reduced sulphur.

UPM's target is to reduce acidifying flue gases ($NO_X$ and $SO_2$) by 20% by 2030 from 2015 levels. Progress for UPM Pulp since 2015 has been 9%. In line with UPM's commitment to reduce fossil $CO_2$ emissions (Scope 1 and 2) by 65% by 2030, a roadmap has been created to achieve this target, and its implementation is underway.

## Water

In 2024, specific wastewater volume decreased from 32.8 $m^3$ per tonne of pulp to 27.9 $m^3$ per tonne of pulp. The COD load per tonne of pulp decreased from 9.7 kg in 2023 to 8.3 kg in 2024. Since 2008, the base year of our target, the wastewater volume per tonne of pulp has decreased by 35% and the COD per tonne of pulp has decreased 53%. All mills have roadmaps to reduce water use and effluent load to achieve the 2030 targets.

## Waste

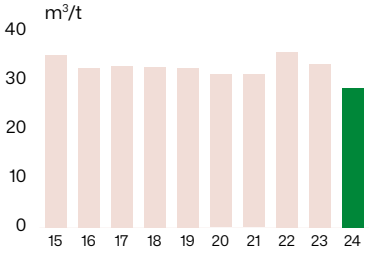
The amount of waste sent to landfills decreased from 13.8 kg per tonne of pulp in 2023 to 12.1 kg per tonne of pulp in 2024. Over the last ten years, the amount of waste sent to landfills has decreased by 24%. Green liquor dregs are one of the most challenging side streams of UPM's pulp production, and we are currently developing innovative processes to utilize this material in Finland and Uruguay.

## Biodiversity

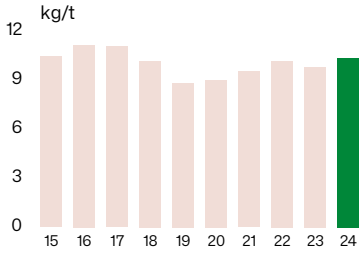
Mills report on their land use with regard to biodiversity. In 2024, a total of 4,100 hectares of nature-oriented areas were owned or managed by pulp mills and integrated pulp and paper mills. This consists mainly of the Mafalda protection area in Uruguay, which is managed by the Fray Bentos pulp mill.

Read more at **upmpulp.com**

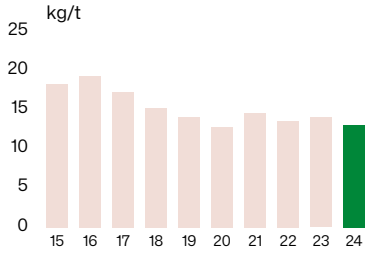
**Process wastewater volume per tonne of chemical pulp**
$m^3/t$



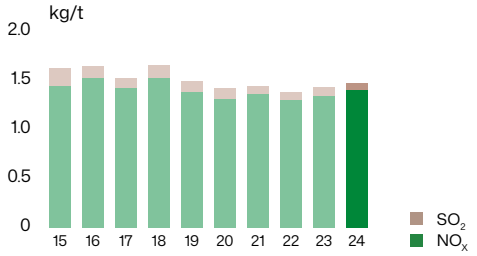

**COD load per tonne of chemical pulp**
kg/t




**Landfill waste per tonne of chemical pulp**
kg/t




**Acidifying flue gases per tonne of chemical pulp**
kg/t



# Environmental development – Communication Papers

Our annual paper production capacity of 4.3 million tonnes is produced in 10 paper mills located in Finland, Germany, the United Kingdom and the United States. The combined heat and power (CHP) plants at the paper mill sites included in the business area. To reduce emissions while contributing to the wider transition towards renewable energy, we installed new electric boilers across our paper mills in Finland and Germany.

Demand for graphic papers in Europe increased by 1% in 2024 compared with 2023. Demand for magazine papers in North America were at same level compared to 2023. Paper production ceased at UPM Hürth in August and at UPM Nordland Papier PM 3 in December.

*Figures on this page include the UK site, UPM Caledonian and US site, UPM Blandin, which are not EMAS-registered. Information about these sites and the summary figures on this page have not been verified in an EMAS context. On this page and the next, the whole of UPM Nordland is included in Communication Papers' figures, and the whole of UPM Jämsänkoski is included in Specialty Papers' figures, even though in both of those mills there is one paper machine belonging to the other business.*

## Fibre

In 2024, 19% of the fibre used in UPM's paper production was recycled fibre. In 2024, 83% of the fibres used in paper production originated from FSC™ and/or PEFC certified sources, the remainder came from controlled sources.

## Water

In 2024, specific wastewater volume increased from 13.4 $m^3$ per tonne of paper to 13.6 $m^3$ per tonne of paper. The COD load decreased slightly, from 4.7 kg per tonne of paper to 4.4 kg per tonne of paper. Water consumption remained steady at 28 $m^3$ per tonne of paper, the same as in 2023. All mills have prepared roadmaps to reach their targets for reducing water use and effluent load by 2030.

## Air

In 2024, $NO_X$ and $SO_2$ emissions per tonne of paper decreased slightly.

Both specific emissions of fossil carbon dioxide from own fuel usage (Scope 1) and specific fossil carbon dioxide emissions from purchased electricity (Scope 2) increased from 2023.

## Energy

In 2024, electricity consumption per tonne of paper remained at 1,400 kWh, the same level as in 2023. In 2024, 37% of the fuels used for on-site energy generation were biomass-based. The renewable share of purchased electricity was 24%.

## Waste

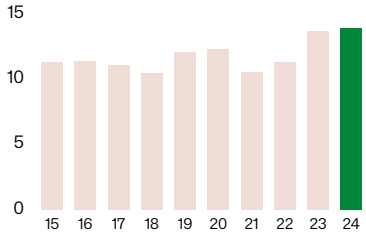
In 2024, the amount of landfilled waste increased slightly from 3.4 kg per tonne of paper in 2023 to 3.7 kg per tonne of paper in 2024. The largest waste fraction at UPM's paper mills is ash resulting from energy generation at the mills. In 2024, over 93% of waste was recycled or recovered as energy.

## Biodiversity

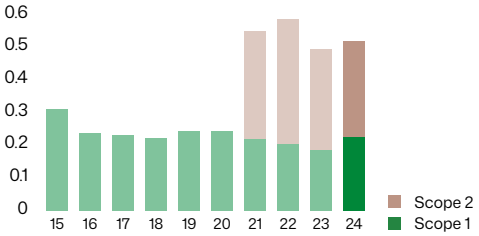
Mills report on their land use with regard to biodiversity. In 2024, a total 468 hectares of nature-oriented areas were owned or managed by paper mills and integrated pulp and paper mills. A "nature-oriented area" is an area dedicated primarily to preserving or restoring nature.

Read more at **upmpaper.com**

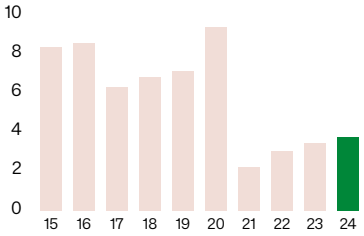
**Process wastewater volumes per tonne of paper**
$m^3/t$



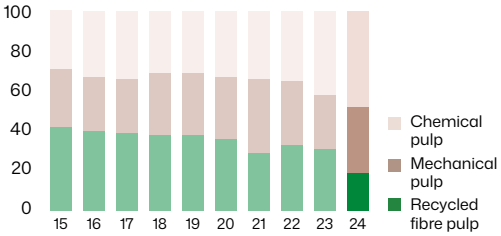

**Fossil carbon dioxide emissions per tonne of paper**
$CO_2$ t/t




**Landfill waste (incl. incineration without energy recovery) per tonne of paper**
kg/t




**Fibre raw materials**
%



# Environmental development – Specialty Papers

Our annual paper production capacity of 2.0 million tonnes is produced in three paper mills located in Finland, Germany, and China. Our mill in Changshu, China, is a prime example of minimizing water usage and maximizing quality through advanced water treatment technologies and strong collaboration. In 2024, Changshu's excellent performance saved 300,000 cubic meters of fresh water. Since 2016, the amount of wastewater discharged per tonne of paper has decreased annually. By 2024, this amount had decreased by approximately 20% compared to 2008.

Global demand for label, release base, and packaging papers remained solid in 2024. UPM's delivery volumes increased for specialty grades and decreased for fine grades. Fine paper markets in China and the Asia-Pacific region were weak but showed slight signs of recovery towards the end of the year.

*On this page and on the previous page, the whole of UPM Nordland is included in Communication Papers' figures, and the whole of UPM Jämsänkoski is included in Specialty Papers' figures, even though in both of those mills there is one paper machine belonging to the other business.*

## Fibre

In 2024, 88% of the fibres used in Specialty Papers' paper production originated from FSC™ and/or PEFC certified forests with the remainder coming from controlled sources.

## Water

In 2024, specific wastewater volume decreased slightly from 9.6 $m^3$ per tonne of paper to 9.2 $m^3$ per tonne of paper. COD load remained the same as in 2023 with 1.0 kg per tonne of paper. Water intake decreased from 18 $m^3$ per tonne of paper to 17 $m^3$ per tonne of paper. All mills have prepared a road map in order to reach their targets for reducing water use and effluent load by 2030.

## Air

Specific emissions of fossil carbon dioxide from own fuel usage (Scope 1) increased slightly from 2023 and specific fossil carbon dioxide emissions from purchased electricity (Scope 2) decreased from 2023. Both $NO_x$ and $SO_2$ emissions per tonne tonne of paper decreased slightly from 2023.

## Energy

In 2024, electricity consumption per tonne of paper increased slightly to 1,300 kWh, up from 1,200 kWh in 2023. In 2024, 27% of fuels used for on-site energy generation were based on biomass. For purchased electricity, the renewable share was 21%. In addition, all Finnish paper mills use nuclear power as $CO_2$-free electricity source.

## Waste

In 2024, the amount of landfilled waste stayed on a very low level with 0.03 kg per tonne of paper. 96% of the waste was recycled or recovered as energy.

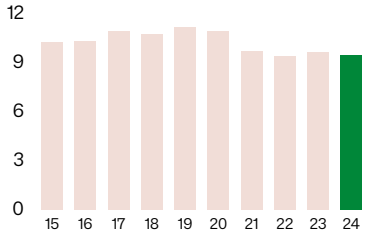
The biggest waste fraction for UPM's paper mills is ash, which results from energy generation at the mills. Ash can be used in various applications, such as in soil stabilization, road construction or the cement industry.

## Biodiversity

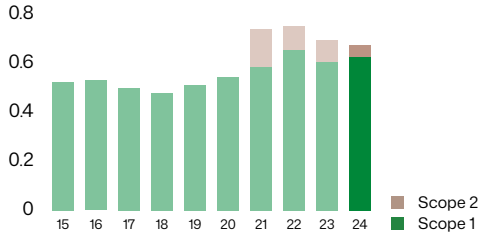
Mills report their land use with regards to biodiversity. In 2024, a total 200 hectares of nature-oriented areas were owned or managed by UPM Specialty Papers' mills. A "nature-oriented area" is an area dedicated primarily to nature preservation or restoration.

Read more at **upmspecialtypapers.com**

**Process wastewater volumes per tonne of paper**
$m^3/t$

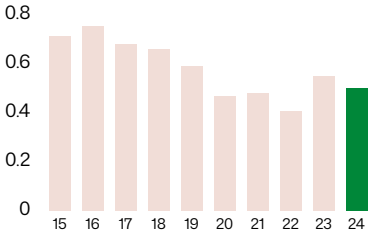



**Fossil carbon dioxide emissions per tonne of paper**
$CO_2$ t/t




**Landfill waste (incl. incineration without energy recovery) per tonne of paper**
kg/t

**Acidifying flue gases per tonne of paper**
kg/t



# Environmental development – Common topics for pulp and paper

### Supplier assessments and requirements

The UPM Supplier and Third-Party Code defines minimum requirements for social, environmental and economic responsibility for all of our suppliers and third-party intermediaries, including agents, joint venture partners and distributors acting on behalf of UPM. We also expect our suppliers to advance the same requirements in their own supply chains.

As part of our supplier selection process, we conduct risk assessments covering our entire existing supplier base. Risk assessments are an integral part of our supplier management activities. We use them to identify possible shortcomings in supplier performance and compliance.

### Clean Run

The company-wide Clean Run concept, which was launched in 2012 and has since been developed to cover all operations, is a holistic environmental management system that aims to improve UPM's environmental performance by bringing environmental issues to the forefront of everyday work and enabling a consistent way of working in all operations. All sites systematically follow up deviations, proactively report observations and near misses, carry out environmental walks and discussions, share best practices, and prepare detailed risk assessments. The Clean Run concept categorizes environmental incidents from 0–5 based on the severity of environmental impact. These categories include observations (Category 0), near misses (Categories 1–2), and non-conformances (Categories 3–5).

In 2024, no major environmental incident occurred at UPM's pulp and paper mills. However, a total of 35 deviations from permit, contractual or other legal obligations occurred. These non-conformances are reported to the authorities and, where relevant, to local stakeholders. Corrective measures are taken to prevent similar situations from occurring again.

### Best Available Techniques (BAT)

The European IPPC Bureau develops industry-specific BAT Reference (BREF) documents, such as for the pulp and paper industry. These conclusions serve as the basis for setting permit conditions for installations covered by the EU's Industrial Emissions Directive. UPM benchmarks all its production lines against the BAT levels.

# Environmental core indicators 2024

| UPM paper mills | All UPM Communication Papers mills | | | | | |
|---|---|---|---|---|---|---|
| | 2022 | | 2023 | | 2024 | |
| Production | 4,620,000 t | | 2,890,000 t | | 2,830,000 t | |
| | Total amount per year | Indicator per tonne of paper | Total amount per year | Indicator per tonne of paper | Total amount per year | Indicator per tonne of paper |
| **Energy efficiency** | | | | | | |
| Total direct energy consumption | | | | | | |
| Electricity consumption | 5,800 GWh | 1,300 kWh/t | 4,000 GWh | 1,400 kWh/t | 4,000 GWh | 1,400 kWh/t |
| Steam consumption | 5,300 GWh | 1,200 kWh/t | 3,600 GWh | 1,300 kWh/t | 3,500 GWh | 1,200 kWh/t |
| Total renewable energy consumption | | | | | | |
| Electricity consumption | 1,000 GWh | 230 kWh/t | 710 GWh | 240 kWh/t | 700 GWh | 250 kWh/t |
| Steam consumption | 2,200 GWh | 490 kWh/t | 1,700 GWh | 590 kWh/t | 2,600 GWh | 920 kWh/t |
| **Material efficiency** | | | | | | |
| Chemical pulp | 1,070,000 t | 230 kg/t | 722,000 t | 250 kg/t | 808,000 t | 290 kg/t |
| Mechanical pulp | 992,000 t | 220 kg/t | 455,000 t | 160 kg/t | 569,000 t | 200 kg/t |
| Recycled fibre pulp | 1,010,000 t | 220 kg/t | 537,000 t | 190 kg/t | 320,000 t | 110 kg/t |
| Minerals | 1,110,000 t | 240 kg/t | 849,000 t | 290 kg/t | 853,000 t | 300 kg/t |
| Binder | 147,000 t | 32 kg/t | 107,000 t | 37 kg/t | 115,000 t | 41 kg/t |
| **Water** | | | | | | |
| Water intake | 106,000,000 $m^3$ | 23 $m^3$/t | 80,600,000 $m^3$ | 28 $m^3$/t | 79,600,000 $m^3$ | 28 $m^3$/t |
| Process wastewater | 50,300,000 $m^3$ | 11 $m^3$/t | 38,600,000 $m^3$ | 13 $m^3$/t | 38,400,000 $m^3$ | 14 $m^3$/t |
| COD [1] | 18,700 t | 4 kg/t | 13,500 t | 5 kg/t | 12,300 t | 4 kg/t |
| TSS [1] | 1,600 t | 0.4 kg/t | 970 t | 0.3 kg/t | 830 t | 0.3 kg/t |
| **Side-products** [2] | 136,000 t | 30 kg/t | 54,900 t | 19 kg/t | 51,400 t | 18 kg/t |
| Ash | 90,100 t | 20 kg/t | 49,100 t | 17 kg/t | 45,500 t | 16 kg/t |
| Wood residues | 45,800 t | 10 kg/t | 5,800 t | 2 kg/t | 6,000 t | 2 kg/t |
| Others | 0 t | 0 kg/t | 0 t | 0 kg/t | 0 t | 0 kg/t |
| **Non-hazardous waste** [2] | 290,000 t | 64 kg/t | 164,000 t | 57 kg/t | 121,000 t | 43 kg/t |
| **Recycling, energy recovery, composting** | 280,000 t | 61 kg/t | 154,000 t | 53 kg/t | 111,000 t | 39 kg/t |
| Ash | 46,900 t | 10 kg/t | 30,900 t | 11 kg/t | 26,000 t | 9 kg/t |
| Sludges | 173,000 t | 38 kg/t | 84,500 t | 29 kg/t | 39,600 t | 14 kg/t |
| Others | 57,700 t | 13 kg/t | 38,700 t | 13 kg/t | 45,600 t | 16 kg/t |
| **Intermediate storage** | 0 t | 0 kg/t | 0 t | 0 kg/t | 0 t | 0 kg/t |
| Ash | 0 t | 0 kg/t | 0 t | 0 kg/t | 0 t | 0 kg/t |
| Others | 0 t | 0 kg/t | 0 t | 0 kg/t | 0 t | 0 kg/t |
| **Landfill, incineration without energy recovery** | 13,700 t | 3 kg/t | 9,700 t | 3 kg/t | 10,300 t | 4 kg/t |
| Ash | 0 t | 0 kg/t | 5 t | 0 kg/t | 0 t | 0 kg/t |
| Sludges and pulp rejects | 12,500 t | 3 kg/t | 8,800 t | 3 kg/t | 9,600 t | 3 kg/t |
| Others | 1,200 t | 0.3 kg/t | 900 t | 0.3 kg/t | 760 t | 0.3 kg/t |
| Recycling rate | 94% | | 94% | | 91% | |
| **Hazardous waste** [3] | 2,200 t | 0.5 kg/t | 1,700 t | 0.6 kg/t | 1,300 t | 0.5 kg/t |
| **Emissions to air** | | | | | | |
| $CO_2$ fossil [4] | 911,000 t | 200 kg/t | 528,000 t | 180 kg/t | 614,000 t | 220 kg/t |
| $CO_2$ fossil from purchased electricity | 1,720,000 t | 380 kg/t | 879,000 t | 71 kg/t | 811,000 t | 290 kg/t |
| $NO_x$, as $NO_2$ | 1,300 t | 0.3 kg/t | 800 t | 0.3 kg/t | 740 t | 0.3 kg/t |
| $SO_2$ | 150 t | 0.03 kg/t | 93 t | 0.03 kg/t | 62 t | 0.02 kg/t |
| Particulates | 12 t | 0.003 kg/t | 7 t | 0.002 kg/t | 6 t | 0.002 kg/t |
| **Land use** [5] | | | | | | |
| Total use of land | 940 ha | | 840 ha | | 800 ha | |
| Total sealed area | 630 ha | | 560 ha | | 530 ha | |
| Total nature-oriented area on site | 300 ha | | 280 ha | | 270 ha | |
| Total nature-oriented area off site | 280 ha | | 220 ha | | 200 ha | |

1) Includes the load before effluent treatment in AUG and CAL (wastewater is treated externally)
2) Reported in dry tonnes
3) Total tonnes
4) The amount of Scope 1 $CO_2$ emissions reported here does not include UPM Nordland's and UPM Schongau's emissions from the power fed into the public grid. Please see the mill statements for more information.
5) Incl. paper mills and integrated pulp and paper mills

# Environmental core indicators 2024

| UPM paper mills | | | | | | |
|---|---|---|---|---|---|---|
| | EMAS-registered UPM Communication Papers mills | | | | | |
| | 2022 | | 2023 | | 2024 | |
| Production | 4,190,000 t | | 2,570,000 t | | 2,470,000 t | |
| | Total amount per year | Indicator per tonne of paper | Total amount per year | Indicator per tonne of paper | Total amount per year | Indicator per tonne of paper |
| **Energy efficiency** | | | | | | |
| Total direct energy consumption | | | | | | |
| Electricity consumption | 5,000 GWh | 1,200 kWh/t | 3,300 GWh | 1,300 kWh/t | 3,300 GWh | 1,300 kWh/t |
| Steam consumption | 4,600 GWh | 1,100 kWh/t | 3,000 GWh | 1,200 kWh/t | 2,800 GWh | 1,100 kWh/t |
| Total renewable energy consumption | | | | | | |
| Electricity consumption | 600 GWh | 150 kWh/t | 130 GWh | 49 kWh/t | 440 GWh | 180 kWh/t |
| Steam consumption | 1,800 GWh | 440 kWh/t | 1,300 GWh | 500 kWh/t | 2,100 GWh | 850 kWh/t |
| **Material efficiency** | | | | | | |
| Chemical pulp | 1,000,000 t | 240 kg/t | 672,000 t | 260 kg/t | 753,000 t | 300 kg/t |
| Mechanical pulp | 789,000 t | 190 kg/t | 385,000 t | 150 kg/t | 474,000 t | 190 kg/t |
| Recycled fibre pulp | 1,010,000 t | 240 kg/t | 537,000 t | 210 kg/t | 320,000 t | 130 kg/t |
| Minerals | 976,000 t | 240 kg/t | 752,000 t | 290 kg/t | 752,000 t | 300 kg/t |
| Binder | 131,000 t | 32 kg/t | 95,100 t | 37 kg/t | 102,000 t | 41 kg/t |
| **Water** | | | | | | |
| Water intake | 96,900,000 $m^3$ | 23 $m^3$/t | 72,700,000 $m^3$ | 28 $m^3$/t | 70,400,000 $m^3$ | 28 $m^3$/t |
| Process wastewater | 41,600,000 $m^3$ | 10 $m^3$/t | 31,300,000 $m^3$ | 12 $m^3$/t | 30,000,000 $m^3$ | 12 $m^3$/t |
| COD [1] | 13,700 t | 3 kg/t | 10,000 t | 4 kg/t | 8,500 t | 3 kg/t |
| TSS [1] | 1,300 t | 0.3 kg/t | 730 t | 0.3 kg/t | 580 t | 0.2 kg/t |
| **Side-products** [2] | 136,000 t | 33 kg/t | 54,900 t | 21 kg/t | 51,400 t | 21 kg/t |
| Ash | 90,100 t | 22 kg/t | 49,100 t | 19 kg/t | 45,500 t | 18 kg/t |
| Wood residues | 45,800 t | 11 kg/t | 5,800 t | 2 kg/t | 6,000 t | 2 kg/t |
| Others | 0 t | 0 kg/t | 0 t | 0 kg/t | 0 t | 0 kg/t |
| **Non-hazardous waste** [2] | 239,000 t | 58 kg/t | 126,000 t | 49 kg/t | 78,800 t | 32 kg/t |
| **Recycling, energy recovery, composting** | 238,000 t | 58 kg/t | 126,000 t | 49 kg/t | 78,700 t | 32 kg/t |
| Ash | 39,300 t | 10 kg/t | 23,500 t | 9 kg/t | 18,800 t | 8 kg/t |
| Sludges | 173,000 t | 42 kg/t | 84,500 t | 33 kg/t | 39,600 t | 16 kg/t |
| Others | 25,500 t | 6 kg/t | 18,200 t | 7 kg/t | 20,300 t | 8 kg/t |
| **Intermediate storage** | 0 t | 0 kg/t | 0 t | 0 kg/t | 0 t | 0 kg/t |
| Ash | 0 t | 0 kg/t | 0 t | 0 kg/t | 0 t | 0 kg/t |
| Others | 0 t | 0 kg/t | 0 t | 0 kg/t | 0 t | 0 kg/t |
| **Landfill, incineration without energy recovery** | 280 t | 0.07 kg/t | 130 t | 0.05 kg/t | 55 t | 0.02 kg/t |
| Ash | 0 t | 0 kg/t | 0 t | 0 kg/t | 0 t | 0 kg/t |
| Sludges and pulp rejects | 5 t | 0 kg/t | 24 t | 0.009 kg/t | 9 t | 0.004 kg/t |
| Others | 280 t | 0.07 kg/t | 110 t | 0.04 kg/t | 46 t | 0.02 kg/t |
| Recycling rate | 98% | | 100% | | 100% | |
| **Hazardous waste** [3] | 2,100 t | 0.5 kg/t | 1,700 t | 0.6 kg/t | 1 300 t | 0.5 kg/t |
| **Emissions to air** | | | | | | |
| $CO_2$ fossil [4] | 788,000 t | 190 kg/t | 437,000 t | 170 kg/t | 513,000 t | 210 kg/t |
| $CO_2$ fossil from purchased electricity | 1,470,000 t | 350 kg/t | 744,000 t | 290 kg/t | 630,000 t | 250 kg/t |
| $NO_X$, as $NO_2$ | 930 t | 0.2 kg/t | 550 t | 0.2 kg/t | 430 t | 0.2 kg/t |
| $SO_2$ | 120 t | 0.03 kg/t | 63 t | 0.02 kg/t | 41 t | 0.02 kg/t |
| Particulates | 8 t | 0.002 kg/t | 5 t | 0.002 kg/t | 3 t | 0.001 kg/t |
| **Land use** [5] | | | | | | |
| Total use of land | 900 ha | | 810 ha | | 760 ha | |
| Total sealed area | 620 ha | | 550 ha | | 520 ha | |
| Total nature-oriented area on site | 280 ha | | 260 ha | | 240 ha | |
| Total nature-oriented area off site | 280 ha | | 220 ha | | 200 ha | |

1) Includes the load before effluent treatment in AUG and CAL (wastewater is treated externally)"
2) Reported in dry tonnes
3) Total tonnes
4) The amount of Scope 1 $CO_2$ emissions reported here does not include UPM Nordland's and UPM Schongau's emissions from the power fed into the public grid. Please see the mill statements for more information.
5) Incl. paper mills and integrated pulp and paper mills

# Environmental core indicators 2024

| UPM paper mills | All UPM Specialty Papers mills | | | | | |
|---|---|---|---|---|---|---|
| | 2022 | | 2023 | | 2024 | |
| Production | 1,560,000 t | | 1,590,000 t | | 1,600,000 t | |
| | Total amount per year | Indicator per tonne of paper | Total amount per year | Indicator per tonne of paper | Total amount per year | Indicator per tonne of paper |
| **Energy efficiency** | | | | | | |
| Total direct energy consumption | | | | | | |
| Electricity consumption | 1,700 GWh | 1,200 kWh/t | 1,900 GWh | 1,200 kWh/t | 2,100 GWh | 1,300 kWh/t |
| Steam consumption | 1,900 GWh | 1,200 kWh/t | 2,100 GWh | 1,300 kWh/t | 2,200 GWh | 1,400 kWh/t |
| Total renewable energy consumption | | | | | | |
| Electricity consumption | 270 GWh | 180 kWh/t | 370 GWh | 230 kWh/t | 340 GWh | 210 kWh/t |
| Steam consumption | 520 GWh | 340 kWh/t | 770 GWh | 480 kWh/t | 800 GWh | 500 kWh/t |
| **Material efficiency** | | | | | | |
| Chemical pulp | 977,000 t | 630 kg/t | 1,020,000 t | 640 kg/t | 1,040,000 t | 650 kg/t |
| Mechanical pulp | 34,800 t | 22 kg/t | 37,700 t | 24 kg/t | 27,800 t | 17 kg/t |
| Recycled fibre pulp | 0 t | 0 kg/t | 0 t | 0 kg/t | 0 t | 0 kg/t |
| Minerals | 353,000 t | 230 kg/t | 377,000 t | 240 kg/t | 348,000 t | 220 kg/t |
| Binder | 52,000 t | 33 kg/t | 51,200 t | 32 kg/t | 55,600 t | 35 kg/t |
| **Water** | | | | | | |
| Water intake | 26,000,000 $m^3$ | 17 $m^3$/t | 27,000,000 $m^3$ | 17 $m^3$/t | 27,600,000 $m^3$ | 17 $m^3$/t |
| Process wastewater | 14,300,000 $m^3$ | 9 $m^3$/t | 14,900,000 $m^3$ | 9 $m^3$/t | 14,800,000 $m^3$ | 9 $m^3$/t |
| COD | 1,400 t | 0.9 kg/t | 1,600 t | 1.0 kg/t | 1,600 t | 1 kg/t |
| TSS | 230 t | 0.2 kg/t | 200 t | 0.1 kg/t | 170 t | 0.1 kg/t |
| **Side-products** [1] | 3,600 t | 2 kg/t | 3,400 t | 2 kg/t | 3,600 t | 2 kg/t |
| Ash | 0 t | 0 kg/t | 0 t | 0 kg/t | 0 t | 0 kg/t |
| Wood residues | 0 t | 0 kg/t | 0 t | 0 kg/t | 0 t | 0 kg/t |
| Others | 3,600 t | 2 kg/t | 3,400 t | 2 kg/t | 3,600 t | 2 kg/t |
| **Non-hazardous waste** [1] | 88,800 t | 57 kg/t | 101,000 t | 63 kg/t | 89,700 t | 56 kg/t |
| **Recycling, energy recovery, composting** | 84,700 t | 54 kg/t | 101,000 t | 63 kg/t | 86,000 t | 54 kg/t |
| Ash | 76,700 t | 49 kg/t | 88,100 t | 56 kg/t | 70,100 t | 44 kg/t |
| Sludges | 5,900 t | 4 kg/t | 4,400 t | 3 kg/t | 8,000 t | 5 kg/t |
| Others | 2,100 t | 1 kg/t | 8,100 t | 5 kg/t | 7,900 t | 5 kg/t |
| **Intermediate storage** | 4,000 t | 3 kg/t | 0 t | 0 kg/t | 6,400 t | 4 kg/t |
| Ash | 4,000 t | 3 kg/t | 0 t | 0 kg/t | 6,300 t | 4 kg/t |
| Others | 0 t | 0 kg/t | 0 t | 0 kg/t | 49 t | 0.03 kg/t |
| **Landfill, incineration without energy recovery** | 0 t | 0 kg/t | 0.9 t | 0.0006 kg/t | 48 t | 0.03 kg/t |
| Ash | 0 t | 0 kg/t | 0 t | 0 kg/t | 0 t | 0 kg/t |
| Sludges and pulp rejects | 0 t | 0 kg/t | 0 t | 0 kg/t | 0 t | 0 kg/t |
| Others | 0 t | 0 kg/t | 0.9 t | 0.0006 kg/t | 48 t | 0.03 kg/t |
| Recycling rate | 95% | | 100% | | 96% | |
| **Hazardous waste** [2] | 250 t | 0.2 kg/t | 200 t | 0.1 kg/t | 250 t | 0.2 kg/t |
| **Emissions to air** | | | | | | |
| $CO_2$ fossil | 1,000,000 t | 640 kg/t | 944,000 t | 590 kg/t | 986,000 t | 620 kg/t |
| $CO_2$ fossil from purchased electricity | 145,000 t | 93 kg/t | 139,000 t | 88 kg/t | 75,500 t | 47 kg/t |
| $NO_x$, as $NO_2$ | 500 t | 0.3 kg/t | 740 t | 0.5 kg/t | 650 t | 0.4 kg/t |
| $SO_2$ | 130 t | 0.08 kg/t | 130 t | 0.08 kg/t | 130 t | 0.08 kg/t |
| Particulates | 14 t | 0.009 kg/t | 5 t | 0.003 kg/t | 6 t | 0.004 kg/t |
| **Land use** | | | | | | |
| Total use of land | 360 ha | | 360 ha | | 360 ha | |
| Total sealed area | 160 ha | | 160 ha | | 160 ha | |
| Total nature-oriented area on site | 200 ha | | 200 ha | | 200 ha | |
| Total nature-oriented area off site | 6 ha | | 6 ha | | 6 ha | |

[1] Reported in dry tonnes
[2] Total tonnes

# Environmental core indicators 2024

| UPM Pulp mills | All UPM Pulp mills | | | | | |
|---|---|---|---|---|---|---|
| | 2022 | | 2023 | | 2024 | |
| **Production** | 2,750,000 t | | 3,400,000 t | | 5,040,000 t | |
| | Total amount per year | Indicator per tonne of chemical pulp | Total amount per year | Indicator per tonne of chemical pulp | Total amount per year | Indicator per tonne of chemical pulp |
| **Energy efficiency** | | | | | | |
| Total direct energy consumption | | | | | | |
| Electricity consumption | 1,700 GWh | 620 kWh/t | 2,100 GWh | 610 kWh/t | 3,000 GWh | 590 kWh/t |
| Steam consumption | 9,900 GWh | 3,600 kWh/t | 12,400 GWh | 3,700 kWh/t | 20,200 GWh | 4,000 kWh/t |
| Total renewable energy consumption | | | | | | |
| Electricity consumption | 1,300 GWh | 490 kWh/t | 1,700 GWh | 510 kWh/t | 2,400 GWh | 480 kWh/t |
| Steam consumption | 9,100 GWh | 3,300 kWh/t | 11,600 GWh | 3,400 kWh/t | 18,800 GWh | 3,700 kWh/t |
| **Material efficiency** | | | | | | |
| Wood | 11,900,000 $m^3$ | 4 $m^3$/t | 15,700,000 $m^3$ | 5 $m^3$/t | 20,400,000 $m^3$ | 4 $m^3$/t |
| Process chemicals [1] | 302,000 t | 110 kg/t | 405,000 t | 120 kg/t | 537,000 t | 110 kg/t |
| **Water** | | | | | | |
| Water intake | 191,000,000 $m^3$ | 69 $m^3$/t | 235,000,000 $m^3$ | 69 $m^3$/t | 282,000,000 $m^3$ | 56 $m^3$/t |
| Process wastewater | 96,800,000 $m^3$ | 35 $m^3$/t | 111,000,000 $m^3$ | 33 $m^3$/t | 141,000,000 $m^3$ | 28 $m^3$/t |
| COD | 27,600 t | 10 kg/t | 32,800 t | 10 kg/t | 41,900 t | 8 kg/t |
| TSS | 1,100 t | 0.4 kg/t | 1,000 t | 0.3 kg/t | 1,700 t | 0,3 kg/t |
| AOX | 210 t | 0.1 kg/t | 270 t | 0.1 kg/t | 280 t | 0.05 kg/t |
| **Residues** [2] | 50,700 t | 18 kg/t | 86,100 t | 25.0 kg/t | 87,800 t | 17 kg/t |
| Tall oil | 49,700 t | 18 kg/t | 85,200 t | 25.0 kg/t | 85,400 t | 17 kg/t |
| Turpentine | 930 t | 0.3 kg/t | 860 t | 0.3 kg/t | 2,400 t | 0.5 kg/t |
| **Side-products** [3] | 7,200 t | 3 kg/t | 4,600 t | 1.0 kg/t | 4,300 t | 0.9 kg/t |
| Green liquor dregs | 390 t | 0.1 kg/t | 240 t | 0.07 kg/t | 220 t | 0.04 kg/t |
| Lime | 6,800 t | 2.5 kg/t | 4,300 t | 1.0 kg/t | 4,100 t | 0.8 kg/t |
| Others | 0 t | 0 kg/t | 0 t | 0.0 kg/t | 0 t | 0 kg/t |
| **Non-hazardous waste** [3] | 144,000 t | 52 kg/t | 156,000 t | 46 kg/t | 183,000 t | 36 kg/t |
| **Recycling, energy recovery, composting** | 96,100 t | 35 kg/t | 104,000 t | 31 kg/t | 114,000 t | 23 kg/t |
| Sludges | 17,500 t | 6 kg/t | 17,900 t | 5 kg/t | 23,300 t | 5 kg/t |
| Bark and wood waste | 67,100 t | 24 kg/t | 74,600 t | 22 kg/t | 78,700 t | 16 kg/t |
| Others | 11,500 t | 4 kg/t | 11,000 t | 3 kg/t | 12,100 t | 2 kg/t |
| **Intermediate storage** | 10,800 t | 4 kg/t | 6,000 t | 2 kg/t | 7,700 t | 2 kg/t |
| Bark and wood waste | 0 t | 0 kg/t | 1,500 t | 1 kg/t | 900 t | 0.2 kg/t |
| Lime | 0 t | 0 kg/t | 0 t | 0 kg/t | 0 t | 0 kg/t |
| Construction waste | 0 t | 0 kg/t | 0 t | 0 kg/t | 0 t | 0 kg/t |
| Others | 10,800 t | 4 kg/t | 4,400 t | 1 kg/t | 6,800 t | 1 kg/t |
| **Landfill** | 37,000 t | 13 kg/t | 46,700 t | 14 kg/t | 61,200 t | 12 kg/t |
| Green liquor dregs | 32,800 t | 12 kg/t | 42,600 t | 13 kg/t | 52,700 t | 10 kg/t |
| Sludges | 3,800 t | 1 kg/t | 3,700 t | 1 kg/t | 2,000 t | 0.4 kg/t |
| Lime | 0 t | 0 kg/t | 0 t | 0 kg/t | 3,500 t | 0.7 kg/t |
| Others | 310 t | 0 kg/t | 460 t | 0.1 kg/t | 2,900 t | 0.6 kg/t |
| Recycling rate | 70% | | 66% | | 62% | |
| **Hazardous waste** [4] | 310 t | 0.1 kg/t | 2,500 t | 0.7 kg/t | 740 t | 0.1 kg/t |
| **Emissions to air** | | | | | | |
| $CO_2$ fossil | 291,000 t | 110 kg/t | 317,000 t | 93 kg/t | 535,000 t | 110 kg/t |
| $CO_2$ fossil from purchased electricity | 199,000 t | 72 kg/t | 78,200 t | 23 kg/t | 82,100 t | 16 kg/t |
| $NO_x$, as $NO_2$ | 3,500 t | 1 kg/t | 4,500 t | 1 kg/t | 7,000 t | 1.0 kg/t |
| $SO_2$ | 220 t | 0.08 kg/t | 270 t | 0.09 kg/t | 380 t | 0.07 kg/t |
| Particulates | 520 t | 0.2 kg/t | 690 t | 0.2 kg/t | 610 t | 0.1 kg/t |
| TRS | 66 t | 0.02 kg/t | 54 t | 0.02 kg/t | 83 t | 0.02 kg/t |
| **Land use** [5] | | | | | | |
| Total use of land | 1,250 ha | | 1,300 ha | | 1,600 ha | |
| Total sealed area | 570 ha | | 570 ha | | 660 ha | |
| Total nature-oriented area on site | 680 ha | | 2,000 ha | | 2,200 ha | |
| Total nature-oriented area off site | 1,600 ha | | 1,600 ha | | 1,900 ha | |

[1] Main chemicals used: oxygen gas, sodium hydroxide, sodium chlorite or chlorate, sulphuric acid, limestone, hydrogen peroxide
[2] Sold volumes
[3] Reported in dry tonnes
[4] Total tonnes
[5] Incl. pulp mills and integrated pulp and paper mills"

# Societal performance

Societal development 18

The UPM Foundation supports and promotes education, entrepreneurship, employment, healthy living, and entertainment in rural Uruguayan communities.

# UPM contributes to societal development

Transparent reporting on all the aspects of responsibility, including environmental, social and economic, is very important in UPM. In 2017, we expanded our EMAS reports to include local societal impacts, in addition to traditionally reported environmental performance. By "societal", we refer both social and economic impacts.

Each mill presents its most important societal impacts in its mill supplement. Many issues are similar across all mills. The mill supplements provide information on our contributions to employment, employee health and safety, tax income, responsible sourcing, and cooperation with communities.

## Employment

EMAS mills employed directly around 7,100 people in 2024. In addition, significant indirect employment impacts are generated by use of raw materials and services. UPM wants to ensure fair, equitable and competitive rewarding for all employees globally. UPM's commitment to fair rewarding is included in our 2030 social responsibility targets, where there are initiatives for living wage and gender pay equity.

We are committed to ensuring that all employees' pay meets at least their local living wage and that the situation is assessed annually. If the assessment shows unexpected wage gaps, they are corrected. We work with an independent third party and that provides us with benchmark data on the countries and cities in which we operate. The next step is to start promoting living wages with our suppliers.

We are also committed to ensuring gender pay equity to all employees. The annual review enables the monitoring of possible gender pay gaps and to make pay adjustments respectively. In 2024, we conducted the company-wide review and implemented the pay adjustments for unexplained gaps.

This commitment to fair rewarding is exceptional and shows our strong dedication to fair treatment of all employees on both a national and global scale.

## Safety and well-being

Our safety standards and requirements are there to protect not only our own employees but also contractors and visitors and neighbors as well. In 2024, the total recordable injury frequency (TRIF, total injuries per one million hours worked) for the entire UPM workforce including contractors, was 5.1 (5.2 in 2023). The lost-time accident frequency (LTAF, lost-time accidents per one million hours worked) was 3.2 (3.4 in 2023). TRIF includes LTA cases, as well as cases involving modified duties or accidents requiring medical treatment. In 2024, the frequency of accidents excluding contractors was 6.1 (TRIF) and 3.4 (LTAF). Mill-specific safety figures can be found in the mill supplements.

Proactive safety is well-integrated into project plans and site practices. For us, quality means thorough investigation and effective risk management, and these play an important role in ensuring the safety of our operations. We have utilized cross-learning to improve safety in our units. Sharing safety observations and best practices has allowed us to learn from each other and improve safety.

We also believe that our employees' well-being is built on a safe and supportive working environment together with a healthy lifestyle and work-life balance. We work closely with our employees and external occupational health organizations to support the well-being of our people. We have several health and well-being initiatives ongoing at various UPM sites. Our aim is to support continuous improvement of employees' health, quality of life and work ability.

## Tax impact

The tax income generated by our business operations is an essential part of our societal impact. This income strengthens the vitality of local communities and supports public services.

UPM pays corporate income taxes in countries where added value is created and profit is generated. Due to UPM's corporate and operational structure, UPM reports and pays its corporate income taxes mainly in countries where production activities take place and innovations are developed. In 2024, UPM's corporate income taxes paid and property taxes were approximately EUR 176 million in total (EUR 221 million in 2023).

In addition to income taxes, UPM's various production inputs and outputs are subject to taxation, which is either paid by UPM (e.g. energy taxes and real estate/property taxes) or collected by UPM (e.g. VAT, payroll taxes and social security contributions). Taxes are paid in accordance with the local tax legislation and regulations of the country in question.

The mills' operations benefit local communities in many ways. The municipal share of corporate income taxes and real estate taxes paid by UPM support the local economy. In addition, income taxes on salaries and social security contributions paid by UPM employees have a significant local impact. Local tax impact figures are presented in the EMAS mill supplements for China, Uruguay and Finland. The nine EMAS mills in their respective municipals/countries generated in total approximately EUR 174 million local taxes in 2024 (including the aforementioned local taxes). The EMAS mills in Germany have not published their local tax footprint in the 2024 mill supplements. However, in Germany, those mills generated around EUR 81 million in local taxes, including income taxes on salaries and social security contributions, municipal trade taxes and real estate taxes.

## Co-operation with communities

We are committed to developing the vitality of communities near our operations through active cooperation and open dialogue with local stakeholders. Charitable donations, support for local initiatives, and employee volunteering are important ways we contribute to the long-term well-being of communities in the countries where we operate. These efforts are coordinated under our Share and Care program, which aligns with UPM's strategy and sustainability targets and takes a holistic view of community needs. As of 2025, the program focuses on youth, education, and science-based actions to promote biodiversity and mitigate climate change. Examples of the mills' engagement with local communities include supporting local educational institutions, associations, youth events, and sports clubs, as well as community consultations via regular roundtables with local stakeholders. Details about the mills' engagement activities can be found in the mill supplements.

## Responsible sourcing

UPM is committed to responsible sourcing practices throughout the entire supply chain. UPM's business operations depend on a large number of suppliers and contractors. The majority of UPM's need for wood is covered by suppliers, and other production inputs, such as chemicals, fillers and recovered paper, are fully obtained from suppliers In addition, contractors carry out a significant proportion of our operations. They work in areas such as maintenance at our production units, construction and forestry operations. We work closely with our suppliers and contractors to continuously improve the efficiency, transparency and sustainability of our supply chain. UPM requires its suppliers to comply with the UPM Supplier and Third-Party Code, which defines minimum requirements for suppliers regarding responsibility in areas such as environmental impact, human rights, labor practices, health and safety, product safety, corruption and bribery.

UPM's continuous target is to have 80% of all spend covered by UPM Supplier and Third-Party Code. In 2024, 91% of the spend was covered.

Our sustainable supply chain program sets out our responsible sourcing practices and priorities. It addresses environmental, social and governance topics contributing to a responsible and resilient supply chain.

In 2024, we set a new target for 2030 to highlight the importance of strategic, critical and high sustainability risk suppliers. Our goal is for all these suppliers to indicate low sustainability risk in the EcoVadis assessment.

UPM's economic impact spreads not just at the corporate or country level but also in local communities.

# Environmental management

Environmental management 21

Of our four modern tree nurseries, three are in Uruguay and one is in Finland. The design and production process of the nurseries is based on the best available techniques and equipment available.

# Environmental management based on continuous improvement

At UPM, environmental management is guided by our strategy, as well as by our Code of Conduct [1] and Sustainability Policy Statement [2].

## Integrated management systems

The mills' certified management systems are the practical tools for environmental management. These systems embrace the principles of continuous improvement through setting targets and monitoring implementation. All mills work with integrated management systems. All mills are certified to the ISO 14001 environmental management system standard.

Additionally, the mills' management systems cover quality, health and safety, and energy issues. At many mills, such systems are certified to ISO standards 9001, 45001, and 50001, or the Energy Efficiency System+ in Finland. All UPM pulp mills and UPM Specialty Papers' production lines also have a Food Safety Management System (ISO 22000) in place. UPM Changshu paper machine 3 has a certified ISO 22000 and a certified FSSC 22000 Food Safety Management System. The Chain of Custody system, which monitors the origin of wood, is also part of the mills' integrated management systems.

The mills' management manual and the accompanying process and work instructions documentation describe competencies, responsibilities and procedures relating to quality, the environment or occupational health and safety. Internal audits and management reviews are carried out at the mills in accordance with the requirements of the standards. Warning and protection systems, compliance with relevant legal and statutory requirements and control of measuring equipment are firmly integrated into the mills' management systems.

## Organization

The mills are responsible for ensuring that external obligations are met and that internal targets are reached. The mills' environmental managers or management appointees act as experts and handle the practical aspects, development, coordination of environmental matters and reporting. The Vice President, UPM Responsibility, is responsible for Group-wide environmental issues.

Environmental topics are part of the day-to-day work of all personnel. Environmental competence is essential and training is organized accordingly. For example, there is regular training on chemical handling, safety and risk

Our environmental management focuses on continuously identifying and mitigating our environmental impacts and setting ambitious targets to improve our overall environmental performance.

[1] Read more at **upm.com/sustainability**
[2] See more on page 42

management, as well as general introduction for new employees.

The mills also take into consideration indirect environmental impacts arising from raw material procurement and transportation. The mills cooperate with the Group's global functions responsible for these issues.

### Continuous improvement

Environmental management is based on the continuous identification of factors that influence the environmental impact of operations. The environmental impact is the starting point for setting annual targets and developing detailed environmental programs with measures, schedules and responsibilities. Attainment of these targets is regularly monitored.

In addition to the specific targets outlined by the individual mills, the Group sets common long-term goals applicable to all sites. These include, for example, increasing the proportion of certified wood, decreasing water consumption and increasing the recycling and recovery of waste (see page 40).

### Environmental risk management

All mills take specific actions to prevent environmental hazards. Environmental risk assessments have been conducted to identify potential risks. The most significant risks at the pulp and paper mills relate to process malfunctions and the transportation, storage and handling of chemicals. The results of the risk assessments are documented at the mills. This data is updated if changes are made to the process. To mitigate the identified risks, the mills provide guidance and training and carry out process modifications and investments when necessary.

In the event of accidents or emergencies, the mills take precautions to prevent or mitigate harmful environmental impacts. Most mill sites have their own fire department or fire crews who are trained to respond to chemical accidents.

The mills' effluent treatment plants are equipped with containment basins to deal with process malfunctions and chemical accidents. The water in these basins can be cleaned in a controlled manner without endangering the operation of the treatment plant.

### Environmental communication

In accordance with our corporate values, UPM openly and actively informs stakeholders about its environmental activities.

The aim is to ensure a rapid and accurate flow of information to the Group's personnel, residents in mill locations and other stakeholders. Separate guidelines have been drawn up for exceptional situations.

The UPM Tervasaari mill fire brigade holds weekly training sessions and organizes regular drills for personnel. This photo shows the preparation for a smoke diving exercise that included searching for and rescuing a victim.

# Manufacturing of pulp and paper


Manufacturing of mechanical pulp 24

Manufacturing of chemical pulp 25

Manufacturing of recycled fibre pulp 26

Manufacturing of paper 26

Schematic 27

Wastewater treatment 28


The UPM Changshu paper mill has three paper machines that produce woodfree fine paper and specialty paper. The pulp used for papermaking is 86% sourced from sustainably managed forests.

# From wood fibres to pulp and paper

The raw materials used in papermaking are mechanical and chemical pulp made from fresh wood fibre and recycled fibre pulp made from recovered paper. At UPM, chemical pulp is produced at UPM Pulp mills and mechanical and recycled fibre pulp at paper mills. In addition to fibre raw materials, the process requires water. Some paper grades also require mineral fillers, coating pigments and binders. Different process chemicals are used during pulp processing to improve the paper's runnability on the paper machine and the quality of the end products.

The process flowchart and descriptions on the following pages present the main stages of pulp and paper manufacturing.

## Manufacturing of mechanical pulp

### Debarking

Mechanical pulp is produced from fresh spruce logs. The logs pass through a debarking drum, and the bark is burned in a boiler to produce electricity and heat or is otherwise reused. Chips produced as by-products at sawmills are also used.

### Manufacturing of mechanical pulp

The wood fibres are separated from each other by mechanical pressure. Frictional forces transform the mechanical effort into heat, which softens the lignin that acts as a binder between the wood fibres. This breaks the bonds between the fibres.

In the manufacturing process of refiner mechanical pulp, wood is first chipped, then the chips are refined into pulp in refiners. In thermomechanical pulping (TMP), pressure and heat speed up fibre separation, and some of the generated heat is recovered and used to dry paper.

In the manufacturing of groundwood pulp, entire spruce logs are pressed against a rotating grindstone. Pressure and heat may be used to enhance the grinding process.

Since lignin remains in the finished mechanical pulp, wood pulp yield in mechanical pulp production is twice the yield obtained in the chemical pulping process. However, mechanical pulp production requires a lot of electricity.

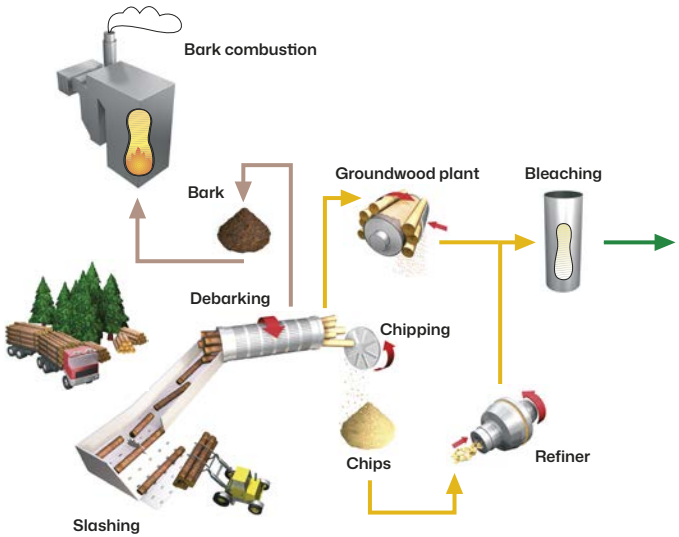
### Bleaching

Mechanical pulps are bleached using hydrogen peroxide or dithionite. Auxiliary chemicals are also used to regulate the acidity of the bleaching process and to ensure the desired effect of the bleaching chemicals.

### Properties of mechanical pulp

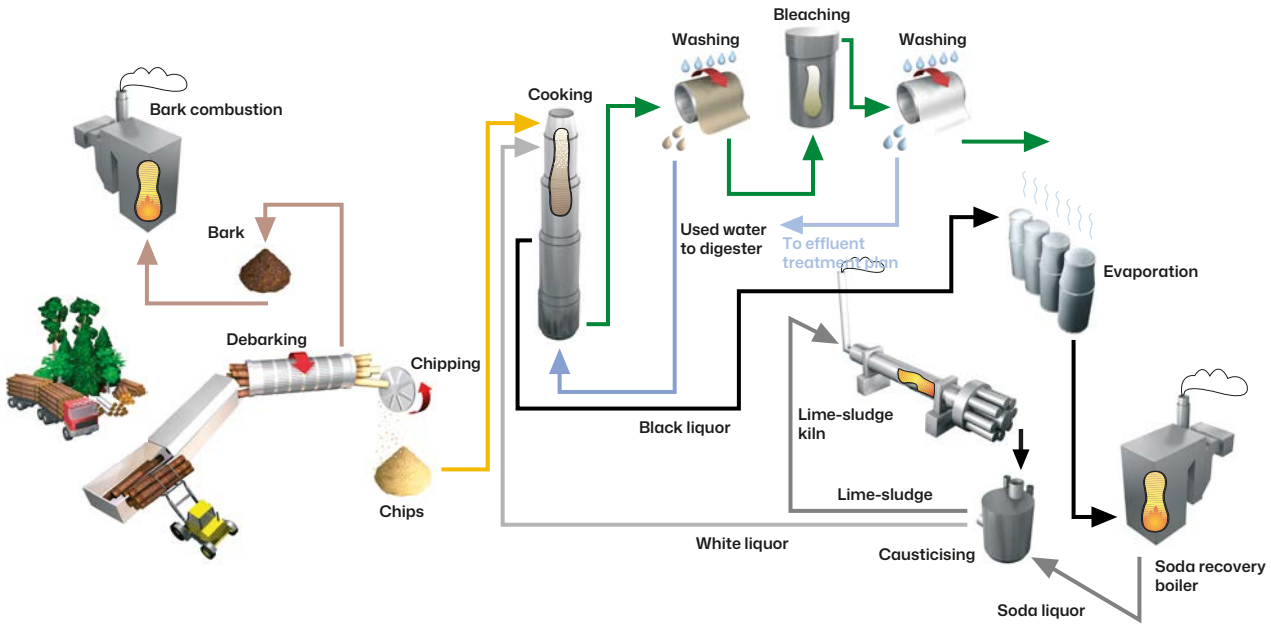
Mechanical pulp is used to manufacture printing papers due to its economic advantages and optical characteristics. It is used in products that are not archived, because the lignin, the binder contained in the pulp, turns yellow when exposed to UV light.

Sustainably grown and sourced wood is first debarked and cut into small chips for more efficient pulping.



## Manufacturing of chemical pulp

Pulps prepared from different tree species have different properties. Long fibre softwood pulp is used to increase paper strength and to improve runnability on the paper machine. Short fibre hardwood pulp improves paper's printing properties. Bleached chemical pulp preserves its properties and brightness even when printed products are archived for a long period.




### Debarking

Pine, spruce, birch and eucalyptus are raw materials used to produce so-called kraft or sulphate pulp. This kraft pulp preparation process begins with debarking the logs in the debarking drum. The bark is burned in a boiler to produce electricity and heat.

### Chipping

The debarked wood is chipped and screened. Additionally, chips produced from slabs and sticks, which are created as by-products of sawmills, are used.

### Cooking

In the production of chemical pulp, the wood fibres are separated from each other by dissolving the lignin, the substance that binds the fibres together, using chemicals and heat. In the kraft process, the wood chips are cooked in a liquor containing sodium hydroxide and sodium sulphate as chemical agents. This mixture is called white liquor. During cooking, about half of the wood raw material is dissolved in the cooking liquor. For this reason, the yield is only about half of what is obtained in mechanical pulping.

### Washing

The cooked pulp is washed with hot water. The used water is directed in a counterflow direction to the digester to be used for washing water. The washing water leaves the digester as diluted black liquor, which contains dissolved wood and used cooking chemicals, and enters the evaporation stage.

### Bleaching

After cooking, kraft pulp turns brown. Then, it is bleached in a multistage process. UPM's mills use oxygen, hydrogen peroxide, chlorine dioxide and ozone as bleaching agents. After the oxygen stage, the washing waters from the bleaching stages are pumped to the effluent treatment plant.

### Evaporation

In this process, water is removed from the black liquor in several stages so that the resulting black liquor has a high concentration and contains only about one-fifth water.

### Soda recovery boiler

Black liquor is burned in the soda recovery boiler to recover energy in the form of heat and electricity. The chemical pulp mill produces energy not only for its own needs but also for the paper mills or external parties. The cooking chemicals are recovered as soda liquor from the soda recovery boiler.

### Causticizing

Causticizing reconverts the sodium carbonate in the soda liquor into sodium hydroxide using burned lime. In this way, the soda liquor is reconverted into white liquor. Causticizing transforms the burned lime into calcium carbonate, i.e. lime sludge.

### Lime sludge kiln

The lime sludge is separated from the white liquor, washed and reconverted into burned lime in the lime sludge kiln.

## Manufacturing of recycled fibre pulp

### Pulping

The production of recycled fibre pulp begins with the processing of recovered paper in a drum pulper. There, the stock is diluted to form a pulp-water slurry. Any plastic, metal or other impurities contained in the recovered paper are removed by screening. These impurities are reused when possible or taken to a landfill. When using old, corrugated cardboard to produce specialty papers, no additional processing steps are needed. However, when producing new graphic paper from recovered graphic paper, the following steps are necessary to produce deinked pulp.

### Flotation

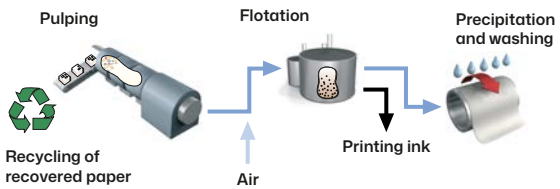
In flotation, soap is added to the pulp/water mixture and air is blown in to remove the printing ink. The hydrophobic printing ink particles adhere to the ascending air bubbles, and the foam formed on the surface is removed.

### Screening and washing

After flotation, the pulp is screened to remove any remaining impurities. Finally, the pulp is washed.

### Deinking residues

About 70–80% of the recovered paper delivered to the mills can be used to produce new paper. The main losses are deinking sludge from the flotation process (too short and brittle fibres, pigments and printing inks). The fibrous sludge generated is either dried and burned at the mill's power plants to produce electricity and heat or dispatched for use in other applications.




## Paper manufacturing

### Paper stock

Fibres (mechanical, chemical and/or deinked pulp), fillers and additives are mixed to form a slurry consisting of more than 99% water.

### Wire section

The pulp slurry is spread on the wire, i.e. the plastic fabric on which the paper web forms as the water drains through it by suction. The wire section achieves a dry matter content of about 20%.

### Press section

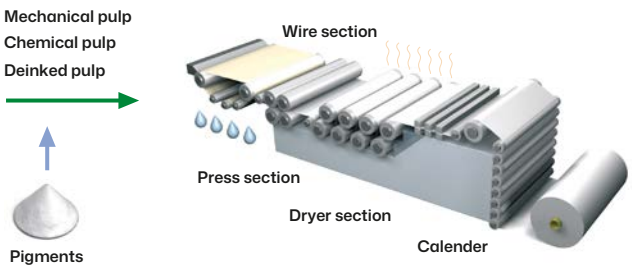
The wet paper web is pressed between felts and rolls until it has a dry matter content of some 45%.

### Dryer section

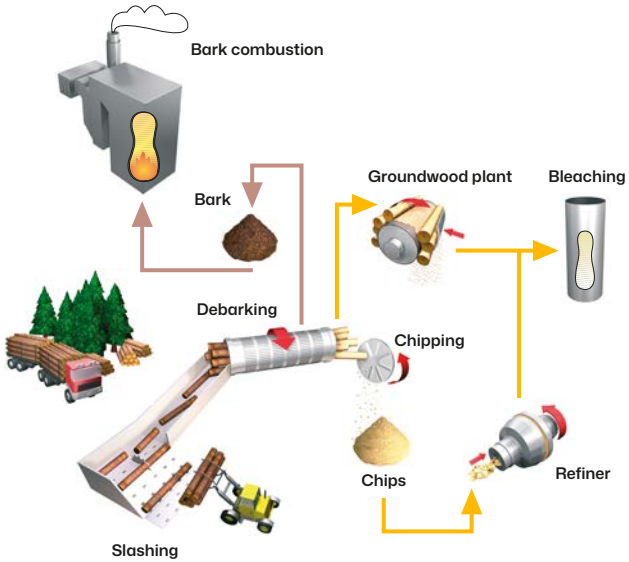
In final drying, a dry matter content of 90–95% is achieved by dewatering the web through evaporation using hot cylinders. The heat used for drying is recovered, and the water vapor is discharged into the air. The "plume" emitted from the exhaust stacks of a paper mill consists of this water vapor.

### Coating, calendering and finishing

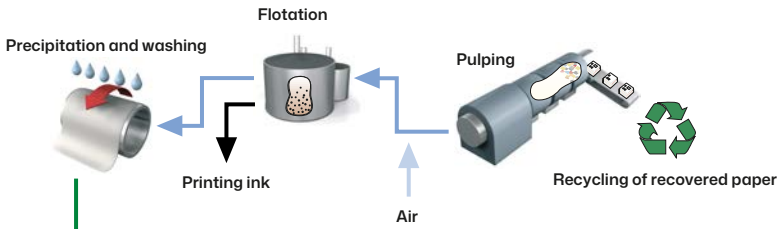
The quality and properties of the paper can be modified by coating the paper and/or by calendering it on or off the machine. The calender smooths the surface of the paper by passing it once or several times through a series of nips. Paper can be coated several times. A coater unit applies a coating color, after which the paper web is dried. The machine or parent reel is cut into smaller rolls that are more suitable for further processing or into sheets.



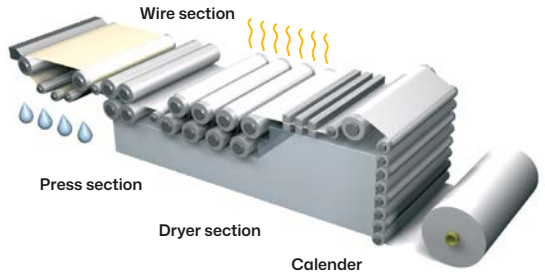
## Manufacturing of mechanical pulp



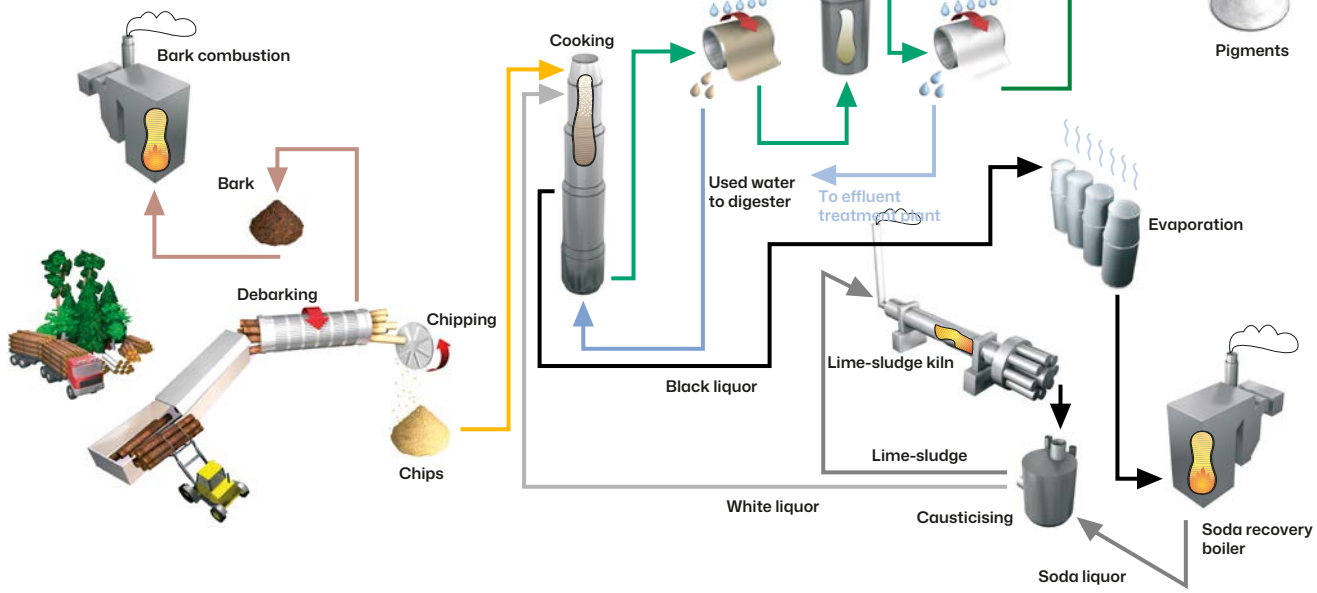

## Manufacturing of recycled fibre pulp



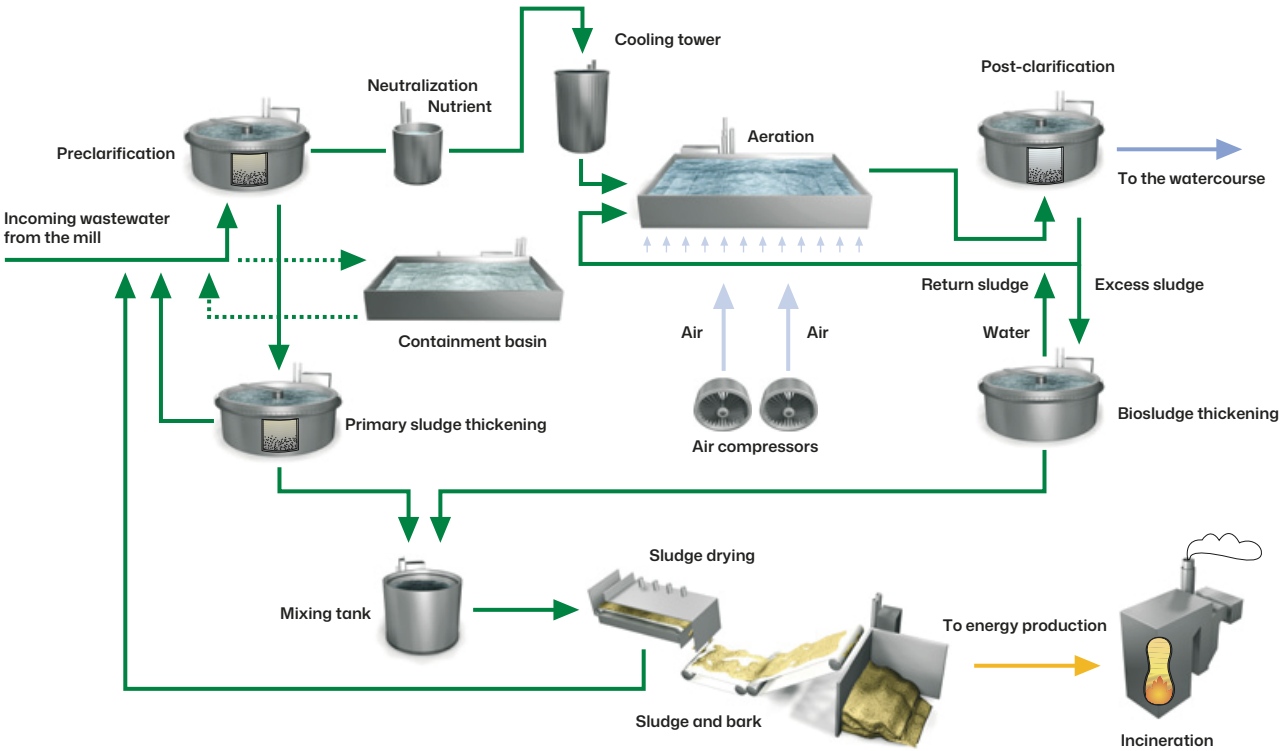

## Paper manufacturing




## Manufacturing of chemical pulp



## The principle of wastewater treatment at an activated sludge plant




### Incoming wastewater

The substances in pulp and paper mill wastewater are mainly derived from wood, including lignin, starch, alcohols and nutrients. Additionally, the wastewater contains different process chemicals and adjuvants, such as coating pigments, fillers and binders. Some of these substances are solid, while others are colloidal or dissolved. Compared to municipal wastewater, only small amounts of nutrients (nitrogen and phosphorus) are present in the mills' wastewater.

### Primary clarification

In the primary clarifier, solid particles settle to the bottom of the basin and are then removed. Solid content removal at this stage should be close to 95–98%.

### Nutrients

For the activated sludge (i.e. the microbes) in the aeration basin to function properly, they need nutrients, especially nitrogen (N) and phosphorus (P). This is why urea and phosphoric acid are added to the water.

### Neutralization

Before entering the aeration basin, the wastewater is neutralized if needed. For this, the water's pH level is adjusted to a level ranging from 6 to 8 by adding lime, sulphuric acid or sodium hydroxide when needed.

### Cooling

The microbes in the aeration basin work best at temperatures below 35°C. If the water temperature is any higher, cooling is required.

### Aeration

In the aeration basin of a biological treatment plant, nature's own microbes and protozoa feed on the organic matter dissolved in the wastewater.

As a result, the organic load of the water decreases and the amount of biomass increases. This process requires oxygen, which is pumped into the aeration basin using compressors.

### Secondary clarification

During secondary clarification, biosludge settles to the bottom of the basin. Most of this sludge is returned to the aeration basin. The excess sludge is pumped to the biosludge thickener, and the treated water is discharged into the watercourse.

### Excess sludge

The excess sludge thickens in the biosludge thickener, from where it is pumped to sludge dewatering presses. The water from the biosludge thickener is returned to the aeration basin.

### Safety basin

In exceptional situations, wastewater can be directed to a separate safety basin and pumped back for treatment once normal conditions have been restored.

### Sludge drying

Primary sludge from primary clarification and the excess sludge from secondary clarification are mixed in a mixing tank. The mixture is then pressed as dry as possible using screw or belt filter presses.

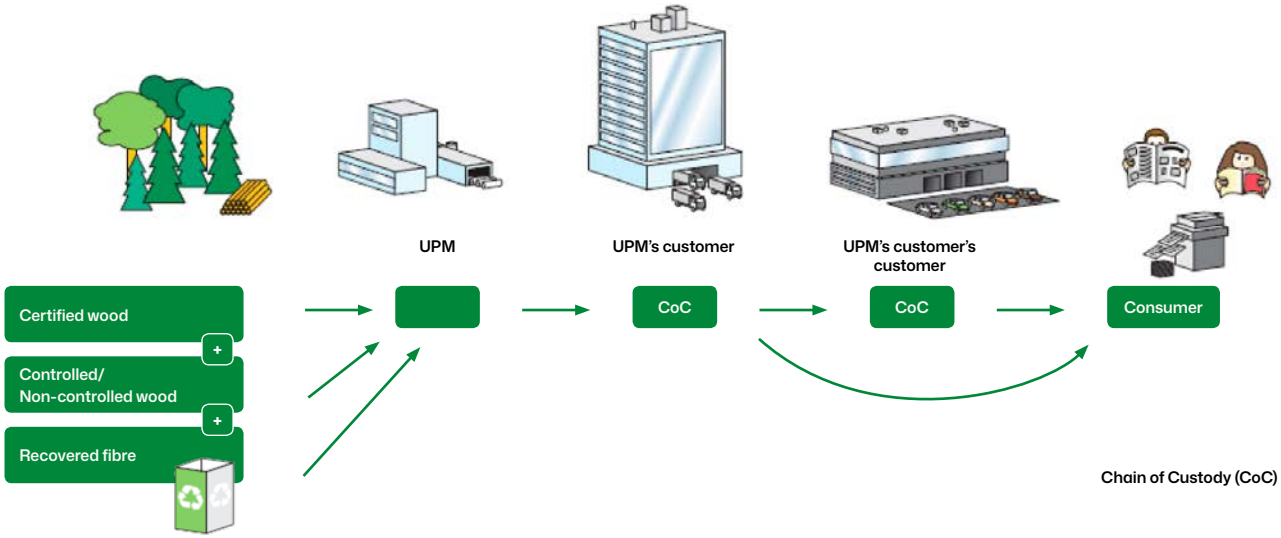
# Raw materials, energy and logistics


| | |
|---|---|
| **Fibre raw materials** | 30 |
| **Pigments and additives** | 32 |
| **Energy** | 33 |
| **Logistics** | 34 |


UPM verifies that all wood raw material supplied to its mills is sustainably and legally sourced, and procured in accordance with the requirements of international forest certification schemes.

# Knowing that wood originates from a sustainable source

Wood is UPM's most important raw material. UPM is committed to sustainable forest management and monitors the origin of wood to ensure it is sustainably and legally sourced. Certified chain-of-custody systems have been implemented in all UPM's mills.




At UPM pulp and paper mills, wood is used to manufacture chemical and mechanical pulp. UPM forest units are responsible for supplying wood to these mills. UPM is committed to forest management and harvesting practices based on internationally accepted sustainable forest management principles.

We source wood fibre mainly from privately and UPM-owned forests in Finland and the USA, and from UPM-owned and leased plantations in Uruguay. Forest certification, chain of custody, origin of wood tracking systems and UPM's global Forest Action program are just some of the tools UPM uses to ensure the sustainable and legal wood sourcing.

## Origin of wood

UPM monitors the origin of the wood it receives and has set strict requirements for its suppliers to deliver sustainable and legal wood fibre. These requirements are implemented through a variety of tools. UPM carries out supplier audits and logging site checks to ensure that suppliers' operations meet these requirements.

## Forest certification

All of UPM's forests are certified according to credible, internationally recognized forest certification schemes, namely FSC™ or PEFC. These certificates provide independent third-party verification of forest management quality in relation to local sustainable forest management criteria.

## Chain of custody

All of UPM's wood sourcing organizations and pulp and paper mills have third-party verified chain of custody systems according to the two main international standards: FSC™ and/or PEFC. The chain-of-custody tool enables the monitoring and reporting of the volumes of certified wood supplied to the mills. This information, along with product labeling, is valuable for verifying sustainable and legal forestry practices to customers and other stakeholders.

Chain-of-custody requirements also ensure that non-certified wood originates from controlled sources. The UPM due diligence system addresses the risks specified in the standards' risk assessment processes by either avoiding or mitigating them to an acceptable low level.

## UPM Forest Action

The global Forest Action program, launched in 2022, steers UPM's wood sourcing operations worldwide and covers its own forests in Finland and the USA, as well as its plantations in Uruguay. Forest Action is the first global program to comprehensively assess the impacts of forestry on a global level. The program goes beyond current standard requirements, and its measures have a positive impact on the fundamental aspects of sustainable forestry: climate, biodiversity, soil, water and societal contribution.

UPM aims to be a leader in sustainable forest management. We want to promote the acceptability of forestry through our actions in our own forests and support other forest owners in achieving their sustainability goals.

Learn more about sustainable forestry at
**upm.com/sustainability**
**upmforestlife.com**
**upm.com/biodiversity**
**UPM Forest Action**

# A balance between fresh wood and recovered paper

Wood is the basic raw material for paper and a renewable resource. Recovered paper is also an essential raw material for us.

Papermaking starts with fibres – either fresh wood fibres in the form of chemical and mechanical pulp, or recycled fibres obtained from recovered paper. The type and proportions of the different fibres used are largely determined by the availability of raw material and paper's quality requirements.

## Fresh wood

UPM procures fresh wood for producing mechanical and chemical pulp. Sawmill residues and small-diameter logs, e.g. from forest thinnings, are used for processing mechanical and chemical pulp. Mechanical pulp, refined or groundwood, is usually produced at the respective paper mill site. All of UPM's pulp mills in Finland and Uruguay produce chemical pulp.

Pulp is also sourced from external pulp suppliers.

All pulp suppliers are required to comply with UPM's pulp supplier requirements, including tracing the origin of wood and sustainable forestry. Pulp suppliers must also provide information on the environmental performance of their operations annually. In addition, UPM regularly monitors and audits its pulp suppliers.

## Recovered paper

UPM uses recovered paper at two German mills, which are located in highly populated regions. This ensures that recovered paper is available in sufficient amounts close to the paper mills. However, due to transportation distances, using a high level of recovered paper is not economically and ecologically favorable in regions with small populations.

Wood fibres can be reused several times before they are no longer suitable for paper production. UPM mainly uses graphic recovered paper from household collections, such as newspapers, magazines, catalogues and advertising supplements.

Recovered graphic paper comes from Europe, where the main suppliers are waste management companies, printing houses, and local authorities.

# Additives and chemicals used in pulp and paper production

Mineral fillers, coating pigments and binders are important raw materials for paper production. Furthermore, chemicals are needed in stock preparation, bleaching and process management.

Every stage of the papermaking process requires certain additives, from preparing the raw materials to forming the paper web to coating the finished paper sheet. In chemical pulping, chips are cooked in a liquor containing sodium hydroxide and sodium sulphide as chemical agents. UPM's mills use oxygen, hydrogen peroxide, chlorine dioxide and ozone as bleaching agents.

Fully optimizing the use of chemicals is an ongoing task. UPM requires its suppliers of raw materials, goods and services to comply with the UPM Supplier and Third-Party Code, which defines minimum requirements for suppliers regarding responsibility for matters such as environmental impact, human rights, labor practices, health and safety, product safety, corruption and bribery. These issues are carefully assessed during the supplier selection process. Before making a purchasing decision, UPM pre-evaluates the safety of all chemicals according to our internal Chemicals Management Standard.

Read more about product safety at **upm.com/sustainability**

**Pigments and additives used at UPM pulp and paper mills**

| Category | Products | Use |
|---|---|---|
| Pigments | Kaolin, ground calcium carbonate (GCC), precipitated calcium carbonate (PCC) | • As mineral fillers to fill the cavities between the individual fibres to improve printability and to reduce the amount of fibre needed<br>• As coating pigments applied to the surface of the paper web to improve printability and the paper's optical properties<br>• Part of the pigments in paper are recovered together with the fibres |
| Binders | Starch derived from cereals or potato, synthetic latex | • Make the coating pigment adhere to the paper surface<br>• Enhance the surface strength of the paper |
| Chemical pulping agents | Cooking chemicals: sodium hydroxide, sodium sulphide<br>Bleaching chemicals: oxygen, hydrogen peroxide, chlorine dioxide and ozone | • Sodium hydroxide and sodium sulphide are recovered and reused in the process<br>• No chlorine gas is used at UPM |
| Deinking agents | Fatty acid, caustic soda and water glass | • Used for deinking recovered paper |
| Bleaching agents | Hydrogen peroxide and sodium dithionite | • Used for bleaching mechanical and recycled fibre pulp |
| Further additives | Alum | • To prevent impurities from forming deposits<br>• To make fibres and pigments bond together |
| | Retention, fixing and anti-foaming agents | • To keep the process clean<br>• To ensure runnability and dewatering<br>• To help web formation (support fibres and fines to be retained on the wire) |
| | Slime control agents, e.g. biocides | • Necessary for the nearly closed-loop water circuits<br>• To prevent microbial growth in pipes and tanks, to improve runnability and paper quality |
| | Optical brighteners and dyes sizing | • Product quality critical chemicals<br>• Used only at ppm level |

# Focus on energy efficiency and $CO_2$-free energy sources

**UPM favors renewable and other fossil $CO_2$-free energy sources, as well as natural gas, and strives to improve its energy efficiency.**

UPM's pulp and paper mills use electrical and thermal energy. The mill operations that require the most electricity are those involved in manufacturing mechanical pulp, operating paper machines and pumping water and stock. Thermal energy is needed to maintain process temperatures and to dry paper and chemical pulp if sold to the market.

At all pulp and nearly all paper mills, steam and electricity are generated simultaneously by combined heat and power (CHP) plants. Some mills purchase all or part of their energy from external power plant companies. In the case of Finnish mills, UPM is a shareholder in these power plant companies.

Electricity is also obtained from the company's own hydropower plants, as well from associated companies in Finland. Many paper mills also generate heat in electric boilers, providing flexibility in heat and electricity generation. The remaining electricity needed is procured from electricity markets.

Power generation methods vary from country to country. UPM's portfolio includes mill-site CHP, wind power, hydro, nuclear and thermal sources. UPM is a shareholder in a power company with a stake in nuclear power plants in Finland.

### Low-carbon energy sources dominate

Thanks to its high energy self-sufficiency rate, UPM has been able to focus on energy solutions that produce less fossil carbon dioxide ($CO_2$). Where possible, fossil fuels are replaced with renewable fuels. When fossil fuels are needed, natural gas is the preferred option, depending on its availability in the region. More than half of the fuels used by UPM are $CO_2$-free, biomass-based fuels. In 2004, the EU directive on $CO_2$ emissions trading came into force in the EU. All UPM mills in the EU have the relevant permit granted by national authorities for the relevant/applicable periods. UPM business areas are responsible for their EU $CO_2$ allowances, and UPM Energy assists with emissions trading operations.

CHP plants burn renewable fuels such as bark, forest residues, fibre residues and solid residues from deinking and effluent treatment plants. Additionally, fossil fuels such as natural gas or light fuel oil are used at CHP plants and steam boilers. Coal is only used as an energy source in mills where there is no other alternative fuel source. Chemical pulp mills combust biomass-based waste liquor, or black liquor, formed during the pulping process.

Some of the heat generated during production processes is recovered using heat exchangers and reused. At mills that produce thermomechanical pulp (TMP), some of the electricity needed can be recovered as steam, which covers most of the mill's steam needs.

Multi-fuel boilers are modern and efficient fluidized bed boilers, which are well-suited for burning wood-based fuels. The high pressure and temperature of the boilers ensure efficient energy production. Modern combustion and cleaning technologies result in low emissions.

To improve energy efficiency, UPM's pulp and paper mills have identified areas where energy could be saved and used more effectively. Many measures have been implemented, but major changes are usually made alongside other investments, such as paper machine line modernizations.

Fossil carbon-free energy sources make up most of UPM's energy portfolio.

# Global logistics operations

Transporting raw materials and finished products puts a strain on the environment. These impacts can be reduced through sensible routing and planning, as well as by favoring rail and sea transportation and low-emission fuels.

Each year, UPM's mills receive several million tonnes of raw materials, additives and operational supplies. Delivering end products to customers also results in high traffic volume. Furthermore, solid waste must be transported to recovery and disposal facilities. UPM uses road, rail or sea transport depending on the distance, connection and delivery time.

Logistics subcontractors are required to comply with UPM's Cargo Handling Manual, which includes instructions for cargo handling, storage, transportation and occupational health and safety.

Most of UPM's haulage is handled by long-term contract partners. Transportation emissions can be reduced by choosing the right fuel and switching to rail and sea transport whenever possible. Our sea transport development projects, such as investing in ocean vessels, focussed on using low-emission fuels and technologies that reduce fuel consumption. Total emissions can also be reduced by ensuring capacity is fully utilized and balancing outbound and inbound deliveries.

The seven LNG vessels introduced in 2022 have reduced greenhouse gas emissions by more than 26% per tonne transported per quarter compared to 2020 levels. This figure accounts for the well-to-wheel emissions, including methane slip.

# Environmental impact


| | |
|---|---|
| **Environmental impacts** | 36 |
| **Air** | 38 |
| **Water** | 39 |
| **Waste** | 40 |


The new UPM Paso de los Toros pulp mill complies with strict Uruguayan environmental regulations and international standards. Our extensive environmental monitoring program covers water, biota, air, soil, noise, and socioeconomic aspects.

# Operations affect the environment in numerous ways

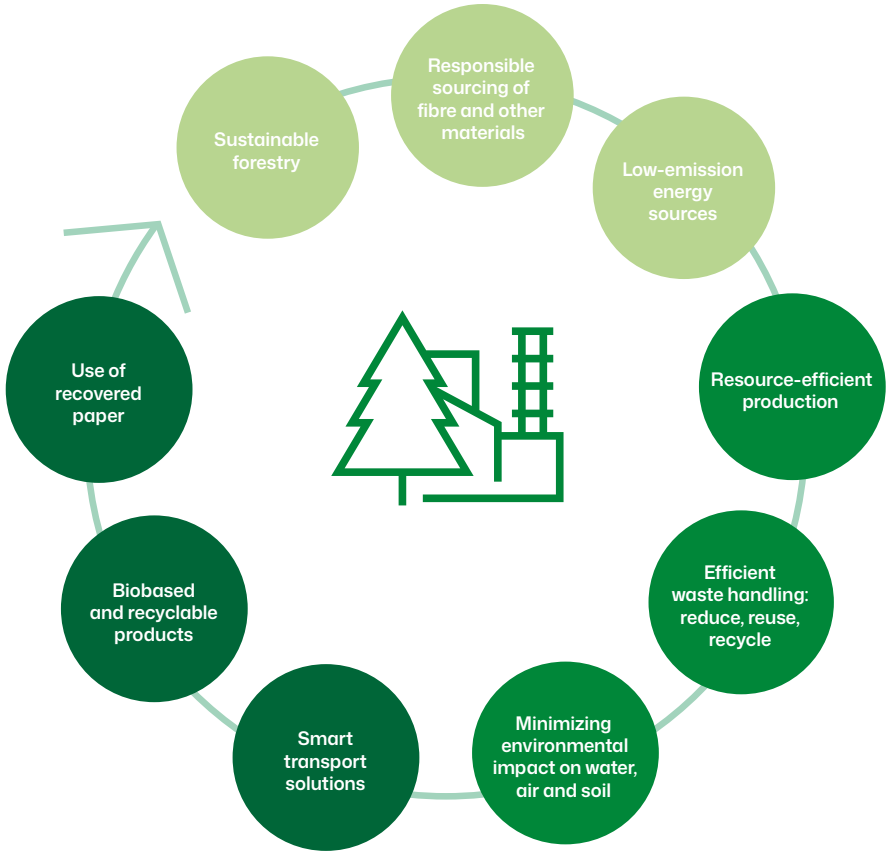
All of UPM's operations impact the environment, both directly and indirectly. Forest management influences the landscape, forest structure and biodiversity. Production processes release emissions into watercourses and the air. Solid waste is generated at production facilities, and noise and odor need to be managed. Indirect impacts mainly arise from transportation and the procurement of raw materials, chemicals, fuels and power.

Paper and pulp manufacturing primarily impacts air and water quality.

UPM's mills have successfully implemented measures to reduce air and water emissions. Improved effluent treatment has improved the quality of cleaned wastewater. Airborne emissions have decreased due to the use of low-sulphur fuels, changes in energy generation methods and environmental investments.

Environmental impact assessments are carried out at each site. The table on the following page provides an overview of key environmental aspects and their environmental impact. UPM considers all environmental aspects to be substantial. At the mill sites, special emphasis is placed on environmental aspects such as water, air, energy, waste and local phenomena, such as noise or odor. Emergency situations are also taken into consideration, and crisis management procedures are in place for these situations. The mills' environmental targets cover all areas in need of action or improvement.

LIFE CYCLE THINKING – OUR APPROACH TO SUSTAINABILITY



| Key environmental aspect | Main environmental impact | Measures |
|---|---|---|
| **Wood raw materials** | Use of the forest ecosystem (biodiversity, products and services from forest ecosystems, land use aspects); Indirect environmental impact by pulp suppliers | Use of wood from certified sustainable forestry (chain-of-custody verification); assessment of pulp suppliers |
| **Chemicals** | Indirect environmental impact by suppliers; pollution due to inappropriate handling or storage | Supplier qualification, supplier audits; requirement for certified environmental management systems; UPM's restricted chemical substances list |
| **Fossil fuels and purchased electricity** | Use of finite resources; climate change | Co-generation of heat and power; maximize use of renewable fuels and other $CO_2$ neutral energy sources; efficient energy use |
| **Airborne emissions from power plants** | Acidification of the soil ($NO_X$, $SO_2$); air pollution (particles); climate change (from $CO_2$ from fossil fuels) | Compliance with limit values*; continuous improvement; use of renewable fuels; emission trading |
| **Emissions to water** | Eutrophication (nitrogen, phosphorus); oxygen demand (COD, BOD); adsorbable organic compounds (AOX) for chemical pulp mills | Compliance with limit values*; continuous improvement; modern elementary chlorine-free chemical pulp production |
| **Waste** | Use of landfill sites and municipal waste incineration plants. Indirect environmental impact by third parties for waste recycling and recovery, e.g. pollution due to inappropriate handling and storage | Increase or maintain high recovery quota by following the principle "reduce, renew, reuse, r ecycle and recover"<br>Third-party/supplier qualification, audits |
| **Noise** | Adverse effects on personnel and local area | Compliance with limit values*; continuous improvement |
| **Odors** | Adverse effects on local area | Optimized operation of production facilities and effluent treatment plants |
| **Transport** | Indirect environmental impact (energy consumption; airborne emissions; noise) | Use of appropriate means of transport; dual-purpose transport; electric forklift trucks |
| **Products** | Disposal after use | Recycling (recovered paper processing) |
| **Soil** | Acidification of the soil by airborne and water emissions; risk of pollution by landfill sites or by chemicals and oilcontaining equipment | Best practices for the storage and handling of chemicals; compliance with landfill permits and legislation (landfill insulation; gas collection and treatment, leachate water treatment) |

* The purpose of limits for wastewater load, airborne emissions and noise specified in the operation permits is to prevent any significant environmental impact

# Air emissions stem from energy generation

Most airborne emissions from pulp and paper mills result from energy generation. The choice of fuels, combustion technology and flue gas purification are ways to reduce these emissions.

The quantity and quality of air emissions depend on the amount of steam produced at power plants or boilers, the operating rate of paper machines and the type of fuels used. Approximately 80% of the fuels used by UPM's power plants are biomass-based and free of fossil $CO_2$ emissions.

Boilers using biomass-based fuels, oil and coal are equipped with filter systems. All power plants continually measure compliance with permit limits, and a third party verifies the reliability of these measurements. Results and emission calculations are reported to the relevant authorities. Possible TRS (total reduced sulphur) emissions from chemical pulp mills are usually caused by shutdowns and start-ups.

| Possible air emissions | Source | Reduction measure |
|---|---|---|
| Carbon dioxide, sulphur dioxide, nitrogen oxides, small amounts of particles and organic compounds | Energy generation at power plants; emission parameter depends on used fuels | • Minimized by efficient purification, by the choice of fuels and by controlling the combustion conditions in the boilers |
| Odor from malodorous sulphur compounds TRS (total reduced sulphur) | Chemical pulp production | • Reduced by collecting and burning |
| Odor from decomposing of organic substances | Closed-circuit water systems (e.g. through high temperature and anaerobic conditions | • Measures taken at mill sites when needed |
| Noise | Production facilities, e.g. wood handling, debarking, suction pumps | • Controlled at the source or along its propagation<br>• Minimized at the stage when new equipment is being acquired and new facilities constructed<br>• Older plants systematically refitted with sound insulation systems |

UPM's cost-competitive, low-emission energy portfolio includes hydropower generation free of fossil $CO_2$ emissions.

# Responsible use of water

**Only a small amount of the water used in the production process leaves as wastewater, which must be replaced with fresh water. All wastewater is cleaned before being released into watercourses.**

Water is an essential resource for pulp and paper production, and it is also needed for cooling machinery. During production, water is used as a diluting agent and transport medium. Fibres, fillers and additives have to be strongly diluted to form smooth, high-quality paper. During manufacturing, compounds from wood fibres dissolve, and a small proportion of the chemicals and other raw materials used in the process remain in the water. Cooling water is not contaminated at all and can be discharged directly into the river or reused in production.

Reducing water usage is an ongoing target for all UPM mills. Using less water also often means using less electricity, chemicals and thermal energy. Process water is used multiple times, and only a small amount ends up as wastewater that must be replaced with fresh water. This fresh water is purified water from rivers, lakes or groundwater taken from wells. A small quantity of water is used for steam production at power plants and purified to meet stringent purity requirements.

### Improving wastewater treatment plants

All wastewater is treated in mechanical and biological effluent treatment plants before being released into watercourses. Most mills have their own effluent treatment plants, or the wastewater is led to a municipal or external effluent treatment plant. The biological treatment stage is an excellent controller of wastewater quality because organisms in this stage are sensitive to harmful compounds. Biological treatment also removes harmful compounds from wastewater.

Emission levels in wastewater are regularly monitored and reviewed, both internally and by the relevant authorities. In some regions, the potential harmful effects of effluent on fish and other aquatic organisms are also assessed through comprehensive receiving water studies.

On average, every liter of water withdrawn is used approximately 20 times in the production process thanks to internal recirculation.

Learn more about water management at **upm.com/sustainability**

# Yesterday's waste is today's raw material

**Reducing solid waste and increasing circularity are key objectives at all UPM mills.**

All UPM's mills have made efforts to reduce the volume of solid waste and to improve handling by sorting waste at the source. Much of the process waste is used as either raw material or for energy generation. As a result of higher efficiency in production processes and increased utilization opportunities, the volume of solid waste taken to landfill sites has decreased significantly in recent years.

UPM aims to become a zero solid process waste to landfill company globally by 2030. This means that UPM will not deposit any process waste in landfills, and no process waste will be incinerated without energy recovery.

Landfills for solid waste account for the most significant environmental impact in waste management. UPM monitors the environmental impacts of its landfill sites in accordance with permits and regulations issued by the relevant authorities.

Ash from biomass-based energy generation accounts for a large share of waste and by-products. It has multiple uses, such as in earth construction, in the cement industry, as a fertilizer, as a raw material for paper fillers, and to replace caustic soda internally.

| Main waste fractions | Source | Usage or disposal |
|---|---|---|
| **Ash** | Power plants | • Most of the ash is utilized e.g. in earth construction, in the cement industry or as fertilizer |
| **Organic process residues such as bark and fibre residues and fibre sludge** | Wood and recovered paper processing, effluent treatment | • Mainly used as fuel by mill power plants<br>• Fibrous residues which are not incinerated are composted or utilized e.g. for soil amendment or in brick industry |
| **Lime and green liquor dregs** | Chemical pulping | • Large proportion of lime is utilized e.g. as liming agent<br>• Part of the green liquor dregs is utilized in field construction or as sulphur reducing agent, the rest is mainly landfilled |
| **Other solid waste** | Recovered paper processing, packaging of incoming materials (mainly metal, board or plastic waste) | • Sorted and utilized whenever possible<br>• Non-usable waste fractions taken to landfill sites or municipal waste incineration plants |
| **Hazardous wastes** | Maintenance (mainly oil or oil contaminated equipment) | • Forwarded to licensed hazardous waste treatment facilities<br>• Compliance with relevant statutory requirements documented |

# Appendices


| | |
|---|---|
| UPM Sustainability Policy Statement | 42 |
| Glossary | 45 |
| Validation statement | 47 |
| Mill contacts | 48 |


Our dedicated professionals ensure that our stakeholders have access to accurate and compliant information available at the right time for their needs.

# UPM Sustainability Policy Statement (extract)

Please see **upm.com/sustainability** for the full version.

### 1.1 Purpose, scope and applicability

This Sustainability Policy Statement complements the UPM Code of Conduct, in particular the chapters on,

- Respecting people and human rights
- Addressing environmental impacts and product safety
- Engaging with stakeholders and society

The purpose of the Policy Statement is to describe UPM's commitments and positions regarding sustainability topics and UPM's responsible business conduct regarding these topics. The document also defines the UPM's approach to the governance of sustainability-related topics, and how UPM's environmental and societal performance is assessed, managed, and continuously improved.

The Policy Statement applies to all of UPM's activities. The management of each UPM business and function is responsible for ensuring its compliance with these principles and commitments, and that the Policy Statement is integrated into UPM's operating procedures and management systems.

The applicability of this Policy Statement to UPM's partners in the value chain and other stakeholders is specified in this document's relevant chapter.

UPM's Marketing, Sustainability and Communications function can give complementary, sustainability-related standards, guidelines and practical instructions that support the implementation of this Policy Statement's requirements.

Reference:
**UPM Code of Conduct**

### 2.1 Management of sustainability topics

The Board of Directors (BoD) oversees the double materiality assessment process, the key sustainability focus areas, and targets as well as the management of material sustainability impacts, risks and opportunities. The Group Executive Team (GET) is responsible for managing impacts, risks and opportunities at Group level and approves the Group's double materiality assessment, the sustainability focus areas, targets and key performance indicators, sustainability actions and sustainability-related policy statements and rules.

In practice, corporate responsibility efforts, including managing impacts, risks, and opportunities, implementing targets and actions, reporting on progress and compliance status, and contributing to the double materiality assessment, take place in businesses and functions. While executing its strategies, UPM and its businesses and functions, including production sites and forest units, are exposed to several financial and sustainability-related risks and opportunities. Each business, function and site is responsible for identifying, assessing, documenting and managing the impacts, risks and opportunities related to its own operations, and for reporting risk exposures, risk management activities and results to its own management team and to the Risk Management team.

The management of each business and function is responsible for ensuring that all employees are made aware of relevant sustainability-related issues in their day-to-day work. Any action that may have a negative impact on people or the environment must be carefully considered.

### 2.8 Engagement with stakeholders and society

UPM is committed to open and constructive engagement with its employees and with a wide range of external stakeholders such as non-governmental organizations, the authorities, industry associations, politicians or local communities in UPM's areas of influence. UPM identifies its key stakeholders and their expectations and engages in dialogue with them. All UPM production sites and forest units that may have a significant actual or potential impact on people or the environment in their surrounding communities shall develop and implement stakeholder engagement plans appropriate to the nature and scope of their activities, ensuring systematic collection of feedback from stakeholders. Other sites are encouraged to develop such processes when relevant.

UPM aims to make a positive contribution to the economic, environmental, and social development of the surrounding communities and to minimize the negative impacts of its current and future operations. UPM recognizes the importance of dialogue and open communication channels with internal and external stakeholders who are or may be affected by its operations and actions. Particular attention shall be paid to individuals or groups who may be at greater risk of negative impacts due to their vulnerability or marginalization, such as women, young persons, migrants, and indigenous peoples.

UPM aims to provide its stakeholders and the general public with accurate and reliable information about its environmental, social and economic performance, including governance. Therefore, UPM has implemented guidelines to ensure that its communication and marketing comply with relevant laws and regulations related to sustainability. UPM businesses and functions shall ensure that all sustainability claims are accurate, verified and presented clearly and specifically, as required in the respective UPM guideline.

UPM pays corporate income taxes where added value is created, and where profit is generated. Taxes are paid in accordance with local tax legislation and regulations.

UPM supports local communities through various projects and initiatives and discloses its activities openly. UPM plans and documents its activities and monitors and reports on its progress annually. The UPM Biofore Share and Care program consists of donations, sponsorships and employee volunteering in specific focus areas.

### 3.2 Biodiversity

All activities that alter nature have an impact on the living conditions of local flora and fauna. UPM aims to mitigate negative impacts, and efforts to maintain or enhance biodiversity must be integrated into UPM's operations.

To develop and implement actions to maintain and enhance biodiversity, it is important to understand and measure the potential negative and positive impacts of activities.

UPM's most significant impacts on biodiversity arise from forest and land management and wood sourcing. Impacts also arise from migration barriers in stream waters and from the environmental load at production sites.

UPM's forest and wood sourcing units shall carry out biodiversity activities as part of UPM's global Forest Action program. UPM is committed to a net-positive impact on biodiversity in its forests in Finland and the USA and its land areas in Uruguay. Appropriate actions and measures are to be developed, implemented, and regularly monitored.

In wood and fibre sourcing, UPM's forest and wood sourcing units must use forest certification to manage biodiversity impacts (see Forest management, wood, and fibre sourcing chapter).

In addition, UPM Sourcing needs to ensure that UPM's suppliers with significant negative impacts on biodiversity know that they are expected to map and understand the biodiversity impacts of their own operations and supply chains, and to engage in relevant biodiversity protection activities.

In dammed or blocked streams, living conditions for fauna should be improved to the extent possible by the business area or unit managing the area. In smaller streams, opportunities to remove obstacles are to be considered. In larger streams with significant hydropower capacities, other means of improving living conditions should be sought.

UPM's businesses shall promote best available techniques to reduce environmental load at production sites to mitigate negative impacts on biodiversity. The occurrence of harmful invasive species shall be prevented. The available means for optimizing conditions for flora and fauna should be promoted.

### 3.3 Climate change

UPM is committed to climate actions to mitigate the direct and indirect impact of its operations on climate, to contribute to science-based emission reduction targets in line with a 1.5°C pathway as outlined in the Paris Agreement.

UPM's businesses and functions need to consider potential physical and transitional changes due to climate change in their strategic considerations and take measures related to climate change adaptation to ensure long-term business resilience.

To achieve UPM's climate targets, all UPM's businesses and functions are required to develop action plans and take measures related to UPM's three climate pillars: forests, emissions reductions, and products, where relevant.

UPM's businesses and functions shall identify potential actions to reduce fossil $CO_2$ and other greenhouse wgas emissions in their operations and supply chains and implement them systematically in line with UPM's investment management processes and emissions reduction targets.

UPM forest units have to ensure that UPM's forest and land areas act as carbon sinks and take measures to improve their adaptability to a changing climate.

UPM's businesses are encouraged to identify the climate impacts of their products and integrate the necessary actions to reduce these impacts into their product design and product development schemes.

### 3.4 Circularity and resource efficiency

UPM uses raw materials, water, and other resources responsibly and works to continuously improve resource efficiency. UPM's businesses are expected to design and optimize their processes for optimal resource efficiency, using best available techniques.

UPM is committed to a circular bioeconomy by using recovered materials from production processes and by developing recycling and utilization options for side streams and residues.

UPM promotes recyclability throughout the value chain and the use of recycled materials in its products.

### 3.5 Energy efficiency

UPM uses energy responsibly and works to continuously improve its energy efficiency. UPM's businesses are required to implement energy management systems to the extent possible to achieve continuous improvement. Energy efficiency must always be considered holistically, as it may have an impact on other environmental performance indicators or the quality of UPM's products.

### 3.6 Environmental impacts from UPM's own operations

UPM complies with the applicable laws and regulations in all countries where it operates. UPM's businesses and functions must handle deviations from environmental permit limits or obligations and other non-conformities in accordance with the UPM Clean Run Standard and the UPM Occupational Health and Safety and Environment (OHSE) Incident Investigation and Reporting Standard. Measures must be taken to prevent reoccurrence and future deviations. UPM's target is to have zero environmental deviations.

UPM pays close attention to the impact of its operations on the air, climate, water, and soil and aims to minimize any adverse effects. This means reducing emissions to air and water, avoiding emissions to soil and minimizing both non-hazardous and hazardous waste. UPM's production sites continuously monitor their environmental load in accordance with local environmental quality parameters. The use of best available techniques shall be promoted.

UPM's production sites and forest units systematically manage their environmental performance based on the principle of continuous improvement. ISO 14001 environmental management system certification is required for all UPM's production sites, except for the terminals, for which ISO 14001 is promoted. The UPM Clean Run Standard must be implemented at all UPM's production sites and forest units.

### 3.7 Forest management, wood, and fiber sourcing

UPM is committed to internationally recognized standards and principles of sustainable forest management and zero deforestation. UPM-owned forests and plantations are 100% certified as sustainably managed or shall be certified within a reasonable time frame if the site is new.

UPM knows the origin of wood and fibers sourced for UPM's products, as UPM's wood and fibre supplies are covered by third-party verified Chain of Custody certificates under FSC™ (FSC N003385) and PEFC (PEFC/02-44-41). UPM promotes the use of certified wood globally and uses certified wood whenever possible. UPM's target is 100% certified fiber by 2030.

UPM's minimum requirements for fiber and wood sourcing include criteria related to the legality of the wood, respect for traditional and civil rights (including the rights of indigenous and tribal peoples), and protection of areas of high conservation value. The minimum requirements criteria also prohibit the conversion of forests to plantations or non-forest use, and the use of genetically modified organisms.

### 3.8 Land use

UPM is committed to ensuring that the land tenure and resource rights of individuals and communities, including indigenous people, are respected, and promoted. UPM adheres to the community engagement practices embedded in forest certification requirements, including Free, Prior, and Informed Consent (FPIC), where applicable. UPM recognizes and upholds the rights, customs and culture of indigenous peoples as defined in the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP). UPM has zero tolerance for land grabbing and fosters a respectful and mutually beneficial relationship with local communities in UPM's areas of influence.

### 3.9 Product stewardship

UPM's product stewardship takes the entire product lifecycle into account. UPM's Sustainable Product Design concept applies lifecycle thinking and lifecycle assessment data, both of which are integrated into sustainable product design practices. When developing new products and improving existing products, the entire raw material chain, production and distribution efficiency, sustainable use and circularity are to be considered. Of particular importance is the sustainability value proposition that products can create for users or society at large. UPM aims to develop products that contribute positively to the UN Sustainable Development Goals.

UPM ensures that its products are safe for their intended use and meet applicable regulatory requirements. Product safety must be prioritized, from product design, development, raw material sourcing and production to delivery, use and disposal.

The UPM Product Stewardship Standard provides a framework for product management that emphasizes thorough risk assessment, adherence to good manufacturing practices and compliance with legislation, including detailed documentation. UPM's businesses and functions are responsible for implementing the necessary actions and processes to meet this standard. Various management systems such as ISO 9001 for quality management and ISO 22000 for food safety management, can be used to integrate these practices and ensure safe and compliant products. Stakeholder engagement is an integral part of UPM's approach, ensuring that employees, customers, and suppliers are actively involved in the product management process.

UPM is committed to using widely recognized environmental labels, such as the EU Ecolabel, and forest certification labels, such as FSC™ (FSC N003385) and PEFC (PEFC/02-44-41).

In relation to chemical management in general, UPM's businesses and functions should ensure that chemicals approved for use in UPM's operations have minimal negative effects on human health, the environment and safety. As defined in the UPM Chemical Management Standard, the hazard properties of chemicals must be carefully assessed, and the approval process must be followed.

### 3.10 Sourcing of materials and services

The UPM Supplier and Third-Party Code defines the minimum level of performance that UPM requires from its suppliers and third-party intermediaries (e.g. agents, advisers, representatives, joint ventures, joint venture partners, local partners, and distributors). UPM also requires its suppliers and third-party intermediaries to ensure that their suppliers and subcontractors providing products or services in connection with the agreement between the supplier/third-party intermediary and UPM comply with UPM's Supplier and Third-Party Code or similar standards.

In addition, there are category-specific requirements for certain materials and services.

UPM Sourcing integrates material sustainability topics into sourcing category strategies and monitors the progress of these topics. Appropriate contractual clauses shall be used in supplier contracts to ensure compliance with UPM's sustainability-related requirements.

UPM Sourcing and businesses shall systematically and regularly assess suppliers from an economic, social, and environmental perspective to identify and prioritize any negative impacts on people or the environment. Identified risks are assessed in more detail through surveys and supplier audits and are addressed through joint development plans, for example. If non-conformities are identified, the supplier is required to take corrective action and address non-conformities effectively. Corrective actions are followed up and monitored.

### 3.11 Water management

UPM's production sites aim to minimize water use and wastewater load. Basins where freshwater is scarce or projected to become scarce, or where the quality of the receiving water is considered to be poor, should be given particular attention. New water-intensive production sites shall not be located in high-water risk basins without appropriate measures to reduce related risks, taking future scenarios and the needs of society and nature into account.

In the event of an extreme and exceptional drought affecting the water basin in the areas where UPM operates, UPM takes necessary measures to reduce the water deficit in the surrounding communities, taking all relevant aspects into account.

UPM's businesses and functions handle water responsibly in UPM's premises worldwide, and access to clean drinking water and sanitation shall be available for everyone working on UPM premises.

UPM manages the impact of its forestry on water resources. UPM's sustainable forest management practices aim to minimize negative impacts and support the role of forests in the hydrological cycle.

# Glossary

**Activated sludge process**
The activated sludge process is a biological wastewater treatment under controlled conditions. It involves the development of specific microbes and protozoa capable of oxidizing the organic matter in wastewater aerobically.

**AOX, Adsorbable organic halogen compounds**
AOX represents the total amount of chlorine bound to organic compounds in wastewater. These compounds occur naturally, but they are also formed in conjunction with the bleaching of chemical pulp. AOX should be limited to a level where it has minimum environmental impact.

**BAT, Best Available Techniques**
BAT refers to the most efficient and advanced technology that is also technically, economically and environmentally feasible.

**BOD, Biological oxygen demand**
**COD, Chemical oxygen demand**
The effluent or wastewater from pulp and paper mills includes organic substances that consume oxygen during biodegradation. Low oxygen content in fresh and seawater can have an adverse effect on plant and animal life. BOD refers to the amount of oxygen consumed in the biological decomposition of organic compounds. COD refers to the amount of oxygen consumed in the complete chemical oxidation of organic compounds.

**$CO_2$, Carbon dioxide**
A molecule that (in the air) acts as greenhouse gas and is important for life on earth. Fossil carbon dioxide emissions arise from fossil fuels, such as coal, oil and petrol.

**Scope 1 $CO_2$ emissions**
Direct fossil $CO_2$ emissions from on-site fuel usage.

**Scope 2 $CO_2$ emissions**
Indirect fossil $CO_2$ emissions from the generation of purchased electricity, steam, heating and cooling.

**CHP, Combined heat and power technology**
In combined heat and power (CHP) production (or cogeneration), both electricity and heat are produced at a thermal power plant. The heat can be used in industry, for district heating, or as process steam.

**Chain of Custody (COC)**
An unbroken trail of documentation that guarantees the identity and integrity of the data, such as demonstrating the origin of wood.

**Chemical pulp**
A generic name for wood-based fibres that are separated from each other by “cooking” wood chips or plants in hot alkaline or acidic solutions of various chemicals.

**Deinking**
The process of removing ink and impurities from recovered paper.

**Deinked pulp:** see recycled fibre pulp.

**EMAS, Eco-Management and Audit Scheme**
A voluntary environmental management system that allows companies and other organizations to improve, evaluate and report on their environmental performance annually. The environmental review is approved by a third-party accredited EMAS verifier.

**Forest certification**
An independent review process that determines if a forest is managed responsibly. There are two global forest certification schemes: FSC™ (Forest Stewardship Council™) and PEFC (Programme for the Endorsement of Forest Certification).

**Graphic recovered paper**
Mainly white paper collected from households, such as newspapers, magazines, catalogues and copy paper.

**ISO 9001**
The Quality Management System standard, published by the International Organisation for Standardisation (ISO), is a voluntary, international, third-party certified system.

**ISO 14001**
The Environmental Management System standard, published by the International Organisation for Standardisation (ISO), is a voluntary, international, third-party certified system.

**ISO 22001**
The Food Safety Management System standard, published by the International Organisation for Standardisation (ISO) is a voluntary, international, third-party certified system.

**ISO 45001**
The Occupational Health and Safety Management System standard, published by the International Organisation for Standardisations (ISO), is a voluntary, international, third-party certified system.

**ISO 50001**
The Energy Management System standard, published by the International Organisation for Standardisation (ISO) is a voluntary, international, third-party certified system.

**Lost-time accident frequency (LTAF)**
Lost-time accidents per million hours worked. The calculation is as follows: (Number of accidents at work resulting in absence or disability of one or more days)/(Actual hours worked)*1,000,000. Lost-time accident type excludes modified duties, medical treatments and first aid cases, but includes fatal accidents. UPM reports separately for its workforce (including UPM employees and supervised workers) and for contractors.

**Mechanical pulp**
Generic name for wood-based fibres separated from each other mechanically.

**N, Nitrogen P, Phosphorus**
N and P are chemical elements essential for plant and animal life. Both substances occur naturally in wood and are often added as a nutrient in biological treatment plants. However, excessive levels released into watercourses can cause nutrient enrichment, i.e., eutrophication, which accelerates the growth of algae and other vegetation.

**$NO_x$, Nitrogen oxides**
These gases are produced during combustion. In moist air, nitrogen oxides can form nitric acid, which is the precipitated as ”acid rain”. This nitrogen-containing rain also has a fertilizing effect, i.e. eutrophication.

**Recycled fibre pulp**
Fibres and fillers retrieved from recovered paper. If the recovered paper is deinked, the processed pulp is called deinked pulp.

**$SO_2$, Sulphur dioxide**
This gas is generated by burning sulphur-containing fuels. When it comes into contact with moist air, $SO_2$ forms sulphuric acid, which contributes to “acid rain” and acidification.

**Supplier qualification**
UPM suppliers are qualified against the UPM Supplier and Third-Party Code, which outlines the minimum compliance requirements for suppliers regarding responsibility for matters such as environmental impact, human rights, labor practices, health and safety, and product safety. Supplier spend in EMAS mill supplements covers all UPM business-to-business spend, excluding wood and wood-based biomass sourcing. Wood sourcing figures are currently only available for regions, not for individual mills.

**Sustainable forest management**
A dynamic and evolving concept, which aims to maintain and enhance the economic, social and environmental values of all types of forests, for the benefit of present and future generations.” Forests and trees, when sustainably managed, make vital contributions both to people and to the planet, bolstering livelihoods, providing clean air and water, conserving biodiversity and responding to climate change.

Managing forests sustainably means optimizing their benefits, including timber and contributions to food security, to meet society’s needs in a way that conserves and maintains forest ecosystems for the benefit of present and future generations.

**Total Recordable Injury Frequency (TRIF)**
Recordable injuries per million hours worked. The calculation is as follows: (LTA at work, excluding contractors (number of LTAs which are one or more days) plus modified duty plus medical treatment)/actual hours worked (UPM)*1,000,000. TRIF excludes first aid cases. UPM reports separately for its workforce (including UPM employees and supervised workers) and for contractors.

**TRS, Total reduced sulphur**
Reduced sulphur compounds that usually cause odor problems and are released during chemical pulp production, for example.

**TSS, Total suspended solids**
TSS are solid materials, including organic and inorganic materials, that are suspended in water.

# Validation statement

EMAS
Verified environmental management
REG.NO. FI - 000058

As accredited or licensed environmental verifiers,

- Kiwa Sertifiointi Oy (FI-V-0001) for UPM Changshu, UPM Fray Bentos, UPM Jämsänkoski, UPM Kaukas, UPM Kymi, UPM Paso de los Toros, UPM Pietarsaari, UPM Rauma and UPM Tervasaari
- TÜV NORD CERT Umweltgutachter GmbH (DE-V-0263) for UPM Augsburg, UPM Nordland and UPM Schongau

have examined the environmental management systems of each mill mentioned above, the information contained in the Environmental and Societal Responsibility 2024 statements, the information in the corporate part, as far as it concerns the respective mills, as well as the information used for the calculation of UPM Corporate level EMAS core indicators.

Following these examinations and the examination of the UPM Corporate Environmental and Societal Responsibility Statement 2024 on 15/09/2025 Kiwa Sertifiointi Oy as the coordinating environmental verifier of this common EMAS validation herewith confirms that the environmental management systems and this UPM Corporate Environmental and Societal Responsibility Statement 2024 together with the Environmental and Societal Responsibility 2024 statements comply with the requirements of the EU's EMAS regulation (EC) No. 1221/2009.

# Mill contacts

**UPM Augsburg**
Eva Männer
Georg-Haindl-Strasse 4
86153 Augsburg
GERMANY
Tel. +49 821 3109 249
eva.manner@upm.com

**UPM Blandin**
Tracy Ritter
115 SW First Street
Grand Rapids
MN 55744-3699
USA
Tel. +1 218 327 5014
tracy.ritter@upm.com

**UPM Caledonian**
Sharon Gallagher
Meadowhead Road
Irvine
Ayrshire KA11 5AT
UK
Tel. +44 1294 314 241
sharon.gallagher@upm.com

**UPM Changshu**
Xialun Tao
#2, Xingye Road, Changshu Economic and Technological Development Zone
Jiangsu Province
P.R. CHINA 215536
Tel. +86 512 5229 5997
allen.tao@upm.com

**UPM Fray Bentos**
Gervasio Gonzalez
Ruta Puente Puerto Km. 307
65000 Fray Bentos
URUGUAY
Tel: +598 4562 0100
gervasio.gonzalez@upm.com

**UPM Jämsänkoski**
Pia Siirola-Kourunen
Tiilikantie 17
42300 Jämsänkoski
FINLAND
Tel. +358 2041 67556
pia.siirola-kourunen@upm.com

**UPM Kaukas**
Minna Maunus-Tiihonen
Kaukaantie 16
53200 Lappeenranta
FINLAND
Tel. +358 204 15 4001
minna.maunus-tiihonen@upm.com

**UPM Kymi, pulp mill**
Päivi Hyvärinen
Selluntie 1
45700 Kuusankoski
FINLAND
Tel. +358 204 15 2514
paivi.hyvarinen@upm.com

**UPM Kymi, paper mill**
Saila-Sisko Vartti
Selluntie 1
45700 Kuusankoski
FINLAND
Tel. +358 50 558 5058
saila-sisko.vartti@upm.com

**UPM Nordland**
Barbara Köster
Nordlandallee 1
26892 Dörpen
GERMANY
Tel. +49 4963 401 1608
barbara.koster@upm.com

**UPM Paso de los Toros**
Valentina Vignola
Camino el Tala, Ruta 5 Km 245,9
45100, Paso de los Toros
URUGUAY
Tel. +598 466 20 100
valentina.vignola@upm.com

**UPM Pietarsaari**
Tomi Heikkinen
Luodontie 149
68600 Pietarsaari
FINLAND
Tel. +358 204 16 9439
tomi.heikkinen@upm.com

**UPM Rauma**
Pasi Varjonen
Tikkalantie 1
26100 Rauma
FINLAND
Tel. +358 2041 43612
pasi.varjonen@upm.com

**UPM Schongau**
Ute Soller
Friedrich-Haindl-Strasse 10
86956 Schongau
GERMANY
Tel. +49 88 61 213 442
ute.soller@upm.com

**UPM Tervasaari**
Ville Juutinen
Tehtaankatu 7
37600 Valkeakoski
FINLAND
Tel. +358 50 410 5847
ville.juutinen@upm.com

upm.com

For general questions on environmental and societal responsibility, please contact UPM Responsibility:
sustainability@upm.com

11/2025