Material balance 2024

UPM's material balance sums up the total material, energy and emission flows to and from UPM worldwide. UPM set long term environmental targets for 2030, and defined indicators to measure performance in key areas. UPM aims to continuously reduce the environmental impacts over the entire lifecycle of its products and the company bases its annual performance evaluation on these indicators.

In 2024, our environmental performance was impacted by increased production of a new pulp mill in Uruguay, our continuous improvement measures, and production capacity alignment to low demand in some business areas. Depending on the environmental parameter, the development on Group level can be positive or negative. For example, some production sites have reduced the volume of solid waste, but total waste volumes increased due to the increased pulp production.

Raw materials

Biomass is the basis for all UPM businesses. Certified chain of custody systems ensure that wood is sourced from sustainably managed forests.

UPM's Supplier and Third-Party Code defines suppliers' minimum requirements with regard to environmental and social responsibility, anti-corruption, safe products, human rights and health and safety practices.

Targets related to raw materials concern the spend covered by UPM Supplier and Third-Party Code, certified fibre share as well as climate-positive land use and positive impact on biodiversity for UPM own forests.

Raw materials

		Renewable share
Wood, m^3	28,000,000	100%
Market pulp, t	1,300,000	100%
Recovered paper, t	700,000	70%
Purchased paper for converting, t	310,000	80%
Minerals, t	1,800,000	0%
Chemicals, t	930,000	15%
Plastics, adhesives, resins, films, t	160,000	0%

Note: tonnes including moisture.

Energy

The majority of electrical and thermal energy is used for paper and pulp production. However, pulp mills are producing more energy than they are using.

UPM is continuously investing in the use of renewable and CO_2-neutral energy to reduce the environmental load from energy generation.

The targets for energy are to increase share of renewable fuel and energy efficiency.

Energy

	2024
Fossil fuels, GWh	8,600 (31,000 TJ)
Renewable fuels[1], GWh	34,000 (122,000 TJ)
Purchased electricity[2], GWh	14,300 (51,000 TJ)
Purchased heat, GWh	250 (880 TJ)

[1] 93% from UPM processes (e.g. bark, fibre sludge, black liquor).

[2] Includes UPM shares of hydro, nuclear and condensing power as well as purchases from the market. UPM's total electricity consumption was 9,700 GWh (35,000 TJ).

Water uptake

Water is an essential resource for pulp and paper production, where water is used within the process and for cooling. The share of other UPM units is minor.

The majority of water that is used comes from rivers or lakes. A small amount comes from groundwater, where water levels are monitored.

The targets for water are to decrease process wastewater volume and effluent load.

Water uptake[1]

	2024
Surface water, million m^3	391 (391,000 megalitre)
Groundwater, million m^3	12 (12,000 megalitre)
Communal water, million m^3	4 (4,000 megalitre)

[1] No water withdrawal from areas with water stress, i.e. UPM's production sites are not located in areas of high physical water risk, but in areas of low water scarcity. Rainwater is not used in the process, but it can be gathered and led to watercourses, depending on the site.

Products

UPM products are mainly based on renewable raw materials that are recyclable and biodegradable.

Third-party-verified ecolabels are commonly used to proof good environmental performance.

The targets for products are to increase the share of ecolabelled products, a climate-positive product portfolio and development of new products and services with contribution to the UN Sustainable Development Goals.

Products

	2024
Paper[1], t	4,600,000
Chemical pulp[1], t	5,000,000
Fluff pulp, t	55,000
Converting materials, t	460,000
Plywood and veneer, m^3	480,000
Sawn timber, m^3	1,200,000
Heat, GWh	920
Electricity[1], GWh	13,400

[1] Paper and chemical pulp total production and total electricity sale are reported including internal sales of paper, chemical pulp and electricity.

Emissions to water

UPM's paper and pulp production is the main source of emissions to water.

All effluents are treated both mechanically and biologically in effluent treatments plants, before released into watercourses.

Emission levels and environmental impacts are regulated and monitored.

Targets have been set to decrease process wastewater volume and chemical oxygen demand (COD).

Emissions into water[1]

	2024
Chemical oxygen demand[2], t	56,600
Biological oxygen demand (7 days)[2], t	5,200
Adsorbable organic halogens, t	280
Process wastewater[3], million m^3	200 (200,000 megalitre)
Cooling water[4], million m^3	180 (180,000 megalitre)

[1] The scope is pulp and paper mills for effluent load, but the scope is the whole Group for water flow figures. However, the impact of other UPM units than pulp and paper mills is minor. Group total water consumption was 25 million m^3 (equals to 25,000 megalitre). No water consumption or discharge in areas with water stress.

[2] Information includes the load from the Augsburg, Caledonian and Hürth paper mills to external effluent treatment plants. BOD is not measured at Hürth.

[3] Process wastewater split by destinations: Surface water 76%, Seawater 18%, Third-party water 6%.

[4] Cooling water split by destinations: Surface water 77%, Seawater 23%.

Emissions to air

The majority of UPM's airborne emissions are caused by energy generation at its pulp and paper mills.

Choice of fuels, combustion technology and flue-gas purification are the primary ways to reduce these emissions.

The targets for air emissions focus on the reduction of fossil CO_2, NO_X and SO_2 emissions.

Emissions into the air[1]

	2024
Sulphur dioxide, t	780
Nitrogen oxides, t	8,700
Particulates, t	680
VOC[2], t	400
Carbon dioxide (fossil)[3], t	2,200,000
Carbon dioxide (biogenic), t	11,700,000

[1] Direct air emissions include emissions from UPM power plants and a respective share of co-owned power plants connected to UPM's energy supply. External power plants or boilers are considered in terms of heat supply.

[2] Production related VOC from UPM Biofuels, UPM Plywood and UPM Raflatac.

[3] In addition to direct CO_2 emissions, UPM is also evaluating and reporting its indirect CO_2 and other greenhouse gas emissions. Power purchased from the grid and purchased heat result in additional 1.2 million tonnes (market-based data). Areas such as transport, raw material production or further processing of UPM products result in additional 8.2 million tonnes. Detailed information can be found in UPM Annual Report.

Waste and by-products

Waste-related impacts are mainly from process waste and by-products generated by our own activities for pulp and paper production and the related internal energy generation. The majority of our process residues is either utilised as raw material or in energy generation. In case of internal use in energy generation the amount is included in our fuel usage, and the remaining ash is reported as residue.

We are committed to responsible sourcing practices in our UPM Code of Conduct. All the minimum requirements, such as legal compliance, are defined in the UPM Supplier and Third-Party Code. Waste companies are qualified against these requirements and evaluated continuously in the same way as other suppliers.

The target for waste is to not deposit any process waste at landfill sites, and no process waste shall be incinerated without energy recovery.

Waste and by-products[1]

	Non-hazardous process waste and by-products, dry t	Other non-hazardous waste, dry t	Hazardous waste, t
By-products and waste for recycling	332,000	16,000	3,500
Energy recovery	234,000	1,400	500
Composting	9,100	-	-
Landfilling	94,000	1,300	-
Incineration without energy recovery	3,100	-	2,600
Other disposal	-	-	400
Temporary storage[2]	23,000	2,500	-
Total	**694,000**	**22,000**	**7,000**

[1] The overall recycling and recovery rate for total of 0.72 million tonnes of waste and by-products is 83%, of which 33% is energy recovery.

Part of the non-hazardous waste is recycled or disposed on-site: waste for recycling 32,000 t, energy recovery 150,000 t, landfilling 79,000 t. Hazardous waste is forwarded to external hazardous waste treatment facilities.

[2] 5,000 dry t of waste have been taken out from the temporary storages to be recycled.