

# UPM's material balance 2019

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 2019, improvements are visible in the reduction of COD effluent load, CO<sub>2</sub>, NO<sub>x</sub>, SO<sub>2</sub> and particulates air emissions and solid waste to landfills.

## 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, human rights, product safety and health and safety practices.

Targets related to raw materials concern supplier code qualified spend, certified fibre share as well as climate-positive land use and positive impact on biodiversity for UPM own forests.

### RAW MATERIALS

	2019	Renewable share
Wood, m <sup>3</sup>	27,500,000	100%
Market pulp, t	1,700,000	100%
Recovered paper <sup>1)</sup> , t	2,300,000	70%
Purchased paper for converting, t	460,000	80%
Minerals, t	2,100,000	0%
Plastics, adhesives, resins, films, t	200,000	0%
Co-mingled domestic waste <sup>1)</sup> , t	180,000	50%

<sup>1)</sup> At UPM Shotton, a Material Recovery and Recycling Facility (MRRF) sorts co-mingled waste, of which the recovered paper fraction is reused at the paper mill and included also in recovered paper usage.

## 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 has invested significantly in the use of renewable and CO<sub>2</sub>-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

	2019
Fossil fuels, GWh	11,600
Renewable fuels <sup>1)</sup> , GWh	27,000
Purchased electricity <sup>2)</sup> , GWh	12,300
Purchased heat, GWh	670

<sup>1)</sup> 81% from UPM processes (e.g. bark, fibre sludge, black liquor)

<sup>2)</sup> Includes UPM shares of hydro, nuclear and condensing power as well as purchases from the market. UPM's total electricity consumption was 13,300 GWh.

## Water

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<sup>1)</sup>

	2019
Surface water, million m <sup>3</sup>	416 (416,000 ML)
Groundwater, million m <sup>3</sup>	19 (19,000 ML)
Communal water, million m <sup>3</sup>	4 (4,000 ML)

ML = megalitre

<sup>1)</sup> No water withdrawal from areas with water stress (assessed for all significant water withdrawals, accounting for 96.5% of total water withdrawal). 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 products and services with contributions to the UN Sustainable Development Goals.

### PRODUCTS

	2019
Paper <sup>1)</sup> , t	8,200,000
Chemical pulp <sup>1)</sup> , t	3,700,000
Fluff pulp, t	42,000
Converting materials, t	570,000
Plywood and veneer, m <sup>3</sup>	760,000
Sawn timber, m <sup>3</sup>	1,700,000
Heat, GWh	1,100
Electricity <sup>1)</sup> , GWh	9,900
By-products (waste for recycling) <sup>2)</sup> , dry t	970,000

<sup>1)</sup> Paper and chemical pulp total production and total electricity sale are reported including internal sales of paper, chemical pulp and electricity.

<sup>2)</sup> The total amount consists of waste for recycling as material 75.9%, waste for energy 23.7% and waste for composting 0.4%.

## 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<sup>1)</sup>

	2019
Chemical oxygen demand <sup>2)</sup> , t	60,000
Biological oxygen demand (7 days) <sup>2)</sup> , t	7,300
Adsorbable organic halogens, t	280
Process waste water <sup>3)</sup> , million m <sup>3</sup>	210 (210,000 ML)
Cooling water <sup>4)</sup> , million m <sup>3</sup>	190 (190,000 ML)

ML = megalitre

<sup>1)</sup> The scope is pulp and paper mills: the impact of other UPM units is minor. Pulp and paper mills' total water consumption was 17 million m<sup>3</sup> (17,000 ML). No water consumption or discharge in areas with water stress.

<sup>2)</sup> Information includes the load from the Augsburg, Caledonian and Hürth paper mills to external effluent treatment plants. BOD is not measured at Hürth.

<sup>3)</sup> Process waste water split by destinations: Surface water 72%, Seawater 22%, Third-party water 6%

<sup>4)</sup> Cooling water split by destinations: Surface water 84%, Seawater 16%

## 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<sub>2</sub>, NO<sub>x</sub> and SO<sub>2</sub> emissions.

### EMISSIONS INTO THE AIR<sup>1)</sup>

	2019
Sulphur dioxide, t	1,100
Nitrogen oxides, t	8,500
Particulates, t	710
VOC, t <sup>2)</sup>	660
Carbon dioxide (fossil) <sup>3)</sup> , t	3,000,000

<sup>1)</sup> 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.

<sup>2)</sup> Production related VOC from UPM Biofuels, UPM Plywood and UPM Raflatac.

<sup>3)</sup> In addition to direct CO<sub>2</sub> emissions, UPM is also evaluating and reporting its indirect CO<sub>2</sub> and other greenhouse gas emissions. Power purchased from the grid results in additional 2.8 million tonnes (market-based data). Areas such as transport, raw material production or further processing of UPM products result in additional 6.7 million tonnes. Detailed information can be found on UPM's webpage.

## Solid waste

The majority of the process waste is either utilised as raw material or in energy generation.

Most production sites have reduced the volume of solid waste and improved handling by sorting waste at the source.

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

### SOLID PROCESS WASTE<sup>1)</sup>

	2019
To landfills, dry t	99,800
To temporary storage <sup>1)</sup> , dry t	13,300
To incineration without energy recovery, dry t	1,500
Hazardous waste for special treatment <sup>2)</sup> , t	5,100

<sup>1)</sup> In 2019, 430 dry t of solid waste have been taken out from the temporary storages to be recycled.

<sup>2)</sup> The main forms of hazardous waste are oil and other oil waste. UPM is working with local licenced external partners on hazardous waste treatment. The total amount consists of waste for recycling as material 45%, waste for energy 17%, waste for incineration 25%, waste for other disposal 12% and for landfills 1%.

