UPM BIOFORE
BEYOND FOSSILS

Updated UPM Corporate Environmental and Societal Responsibility Statement 2019

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 as well as the Fray Bentos pulp mill in Uruguay and the Changshu paper mill in China are registered with the EU Eco-Management and Audit Scheme (EMAS), a voluntary environmental management system for companies and other organisations to improve, evaluate and report on their environmental performance on an annual basis.

UPM Corporate Environmental and Societal Responsibility Statement together with the Environmental and Societal Responsibility reports of each pulp and paper mill of UPM comprise the global EMAS statement of UPM Corporate. The statement has been done according to the European Commission regulation (EC) No 1221/2009.

Since 2018 societal responsibility indicators are part of all the mill supplements. UPM considers it is important to report all the impacts generated at the mill locations, whether it is environmental or societal.

Information within the corporate part concerning the sites mentioned here as well as the information used for calculation of UPM Corporate level EMAS core indicators has been assessed and verified by the respective national EMAS auditor.

The present EMAS corporate part is the update of the UPM Corporate Environmental and Societal Responsibility Statement 2018. Both documents as well as the mill supplements are available at **upm.com**.

The next updated Corporate Environmental and Societal Responsibility Statement will be published in 2021.

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 2019 follows the framework and disclosures of the Global Reporting Initiative's (GRI) Sustainability Reporting Standard and meets the requirements of the Core option. For the Annual Report and GRI content index table, please order a printed copy of the report or visit **upm.com/responsibility**.

Scope of the report
This statement forms the corporate part of the environmental and societal responsibility statement, which has been verified in accordance with the EU's Eco-Management and Audit Scheme (EMAS). The following sites are included in the EMAS scope:
– UPM Augsburg
– UPM Caledonian
– UPM Changshu
– UPM Ettringen
– UPM Fray Bentos
– UPM Hürth
– UPM Jämsä River Mills
– UPM Kaukas
– UPM Kymi
– UPM Nordland Papier
– UPM Pietarsaari
– UPM Plattling
– UPM Rauma
– UPM Schongau
– UPM Shotton
– UPM Steyrermühl
– UPM Tervasaari

Corporate registration number: FI-000058

Information about sites without EMAS registration
UPM Chapelle Darblay and the non-European site UPM Blandin are not EMAS registered. The information concerning these sites has not been assessed or verified.

UPM

We deliver renewable and responsible solutions and innovate for a future beyond fossils across six business areas: UPM Biorefining, UPM Energy, UPM Raflatac, UPM Specialty Papers, UPM Communication Papers and UPM Plywood. As the industry leader in responsibility we are committed to the UN Business Ambition for 1.5°C and the science-based targets to mitigate climate change. We employ 18,700 people worldwide and our annual sales are approximately EUR 10.2 billion. Our shares are listed on Nasdaq Helsinki Ltd.

upm.com

UPM**BIOFORE-BEYOND** FOSSILS

Contents

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

Environmental targets show direction

UPM's Biofore strategy guides us in the achievement of our responsibility targets for 2030 and in our contributions to UN Sustainability Development Goals (SDGs).

In order to guide our responsibility activities, we have established a set of responsibility focus areas with targets and key performance indicators which are reviewed every year based on a materiality analysis. We have also identified the SDGs where we can have the greatest impact, either by minimising our negative impacts or by increasing our positive impacts. Those most relevant SDGs for UPM are aligned with the responsibility focus areas.

In terms of environmental responsibility, the focus areas are sustainable products, the climate, the use of forests and water, and the reduction of waste.

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

ENVIRONMENTAL	2030 TARGET	2030 FOLLOW-UP/2019 RESULTS
Product stewardship Taking care of the entire lifecycle	• Climate-positive product portfolio (continuous) • Development of new products and services with contribution to the UN Sustainable Development Goals (continuous) • All applicable products eligible for ecolabelling by 2030	• Target launched end of 2019 • Target launched end of 2019 • 83% (85%) of UPM sales was eligible for ecolabelling
Waste Promoting material efficiency and circular economy – reduce, reuse and recycle	• No process waste sent to landfills or to incineration without energy recovery by 2030	• 89% (90%) of UPM's total process waste was recovered or recycled. The total amount of waste to landfills decreased by 2% compared to 2018.
Climate Creating climate solutions and working towards carbon neutrality	• Fossil CO_2 emissions from our own combustion and purchased electricity (Scope 1 and 2) reduced by 65% by 2030 [1)] • Maximise the business benefits of greenhouse gas claims (continuous) • Improve energy efficiency annually by 1% (continuous) • 70% share of renewable fuels (continuous) • Acidifying flue gases (NO_x/SO_2) reduced 20% by 2030 [1)]	• Fossil CO_2 emissions reduced by 15% compared to 2015 and 6% compared to 2018 • UPM sold greenhouse gas claims worth nearly 1.1 million CO_2 tonnes • Energy efficiency target was not achieved • Level of 70% (70%) reached in the use of renewable fuels • 12% reduction achieved since 2015 for the UPM average product
Water Using water responsibly	• Effluent load (COD) reduced by 40% by 2030 [2)] • Wastewater volume reduced by 30% by 2030 [2)] • 100% of nutrients used at effluent treatment from recycled sources by 2030 [2)]	• 31% reduction in effluent load achieved since 2008 for the UPM average product • 10% reduction in wastewater volume achieved since 2008 for the UPM average product • 31% of nutrients from recycled resources
Forests and biodiversity Ensuring sustainable land use and keeping forests full of life	• Climate-positive land use (continuous) • All fibre certified by 2030 [3)] • Positive impact on biodiversity (continuous): implementing biodiversity programme and developing monitoring system [4)]	• Target launched end of 2019 • 82% (81%) of all wood used by UPM is sourced from certified forests • Indicators and methods to measure biodiversity were developed and monitoring started

[1)] From 2015 level
[2)] From 2008 level, relevant for pulp and paper production
[3)] Forest management certification
[4)] Covers UPM own forests in Finland

Environmental development – Pulp

Our annual pulp production capacity of 3.6 million tonnes is produced in Finland and in Uruguay. In July 2019, UPM decided to invest in a new world class pulp mill in Uruguay. The USD 2.7 billion investment in a 2.1 million tonnes eucalyptus pulp mill will raise our pulp production capacity by more than 50%. The mill is scheduled to start up in the second half of 2022.

Fibre sources
In 2019, 85% of wood used in pulp production was from FSC® and/or PEFC™ certified forests with the remainder coming from controlled sources.

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

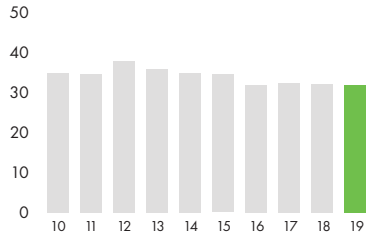
Air
The work to reduce acidifying gases (SO_2 and NO_X) has succeeded well. Former target level to reduce acidifying gases by 25% from 2008 levels has been met. By 2019 reduction was 29%. New target to further reduce acidifying gases by 20% from 2015 levels is well on track. Progress so far is 9%. Several measures have been taken. For example in 2019, Kymi pulp mill's NO_X emissions were significantly reduced thanks to air distribution adjustments made at the recovery boiler. In line with UPM's commitment to reduce fossil CO_2 emissions by 65% until 2030 a road map to achieve this target has been drawn and its implementation is in progress.

Water
The waste water volume per tonne of pulp has decreased by 25% and COD per tonne of pulp has decreased by 51% from 2008 levels, which is the base year of our target. Road map to achieve the 2030 targets includes further actions to reduce waste water volume and effluent load to be able to achieve the targets by 2030.

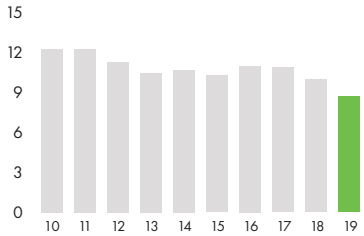
Waste
UPM's pulp mills reduced further the amount of waste sent to landfills per tonne of pulp: by 8% compared to 2018 and 15% over the last ten years. Green liquor dregs are one of the most challenging side streams of UPM's pulp, and we are currently developing several innovative processes for utilising this material in Finland and Uruguay.

Read more at
upmpulp.com

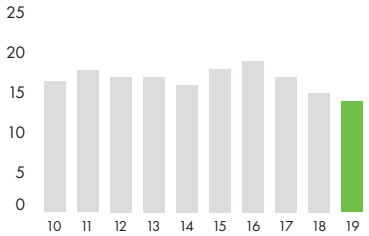
Process waste water volumes per tonne of chemical pulp
m^3/t



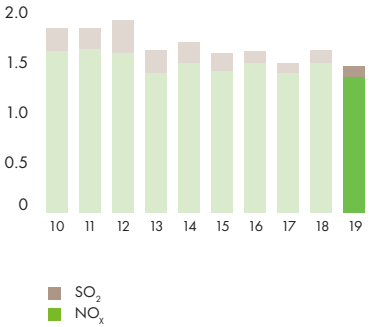
COD load per tonne of chemical pulp
kg/t



Landfill waste per tonne of chemical pulp
kg/t



Acidifying flue gases per tonne of chemical pulp
kg/t



Environmental development – Paper

The development of the demand for graphic papers has been weak, especially in Europe, due to slower economic growth in 2019. To ensure our long-term success, we continued to implement measures to adapt capacity to the profitable customer demand. We closed one paper machine at UPM Plattling, Germany, in July and one paper machine at UPM Rauma in November 2019. We also announced plans to sell or close UPM Chapelle Darblay newsprint mill in France during 2020.

UPM converted one paper machine at UPM Nordland in Germany from fine paper to specialty paper production. The ramp-up of the converted paper machine started end of 2019. The investment will improve the availability of our most recent product innovations including UPM's unique concept for release liner recycling.

At UPM Changshu mill in China we expanded our release liner base paper capacity with an additional 40,000 tonnes.

Fibre
In 2019, 28% of all fibre used in UPM's paper production was recycled fibre. In 2019, 76% of the fibres used in paper production originated from FSC® and/or PEFC™ certified sources, the remainder came from controlled sources.

Water
Average waste water volume and COD load from paper production has already been on a relatively low level for the last 10 years, and achieving further improvements per tonne of product is becoming more and more challenging. Thus, in 2019, all sites have been preparing a road map to reach 2030 targets, and some actions are already being implemented. For example, UPM Kaukas paper mill improved the quality and quantity of clear filtrates after employing an additional disc filter, which has reduced the volume of fresh water used and waste water produced by 20%. At UPM Changshu, the More with Biofore in China programme continued with several pilot trials to reduce fresh water intake by recycling and reusing effluent water.

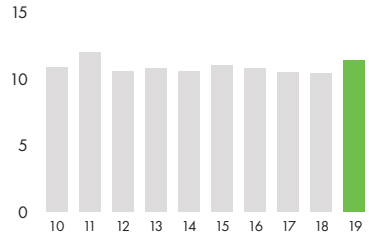
Air
In 2019, emissions of NO_X and SO_2 per tonne of paper decreased by 10% and 3%, respectively, compared to 2018. Emissions of fossil CO_2 per tonne of paper could not be improved further in 2019. But measures have already been taken to decrease fossil CO_2 emission in coming years, e.g. with energy-related projects at UPM Nordland and UPM Hürth.

Energy
The electricity consumption per tonne of paper remained rather stable compared to 2018. In 2019, 41% of fuels used for on-site energy generation were based on biomass. For purchased electricity, the renewable share was 18% in 2019.

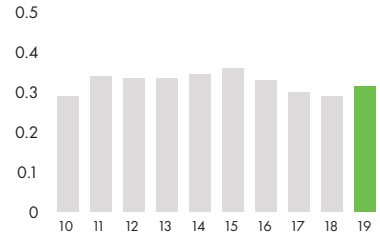
Waste
During the last ten years the amount of landfilled waste per tonne of paper has decreased by 39%. However, in 2019 the amount of landfilled waste per tonne of paper increased by 5% in comparison to 2018. The biggest waste fraction for UPM's paper mills is ash, which results from energy generation at the mills. Overall for UPM's paper mills in 2019, over 90% of waste was recycled or recovered as energy.

Read more at
upmpaper.com

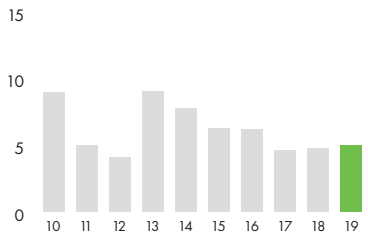
Process waste water volumes per tonne of paper
m^3/t



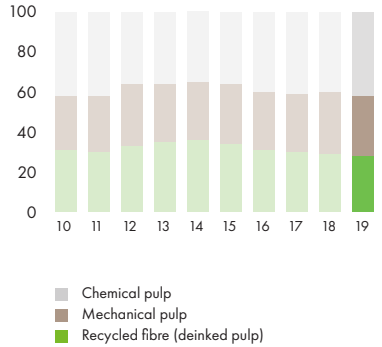
Fossil carbon dioxide emissions per tonne of paper
CO_2 t/t



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



Fibre raw materials used in UPM's paper
%



Environmental development – Common topics for pulp and paper

Supplier assessments and requirements
UPM requires its suppliers and third party intermediaries such as agents, consultants, advisers and joint venture partners to apply the principles of UPM's Code of Conduct and to fulfil the criteria concerning social and environmental responsibility. These requirements are defined in the UPM Supplier and Third Party Code, and suppliers are qualified against these requirements.

UPM's supplier risk assessment covers financial, quality, environmental, social, economic and delivery related risks. The human rights-related risk assessment of suppliers has been enhanced continuously. Based on the risk assessments, UPM selects the suppliers whose performance is assessed in more detail. UPM uses tools such as annual questionnaires, joint development plans and also supplier audits which are initiated based on identified risks or gaps in supplier performance.

Clean Run
Clean Run aims to improve the environmental impact of all UPM operations. The goal is to significantly improve the current level of environmental performance and awareness, including better risk management.

The campaign has been visible in the pulp and paper mills since 2011, and has become a proactive way of managing environmental operations at the mills. Systematic reporting and follow-up of environmental deviations, including reporting of environmental observations, are in active use at all pulp and paper mills. Company-wide guidelines for producing reports according to five defined categories have been implemented. The five categories range from 1 (minor) to 5 (severe). Together with improved information sharing, Clean Run audits have helped to identify development issues and related best practices. With all of the actions taken, the "Clean Run Way of Thinking" is today part of daily routines.

In 2019, no serious environmental incidents occurred at UPM's pulp and paper mills. However, 13 (2018: 19; 2017: 26) minor temporary deviations from permit limits did occur. Those were immediately reported to authorities and corrective measures were taken to prevent similar situations from occurring again.

Best Available Techniques (BAT)
Industry-specific reference documents are developed by the European IPPC Bureau. The document for the pulp and paper industry has been updated, and the conclusions were published by the EU Commission in September 2014. The BAT conclusions are now the reference for setting permit conditions for installations covered by the EU's Industrial Emissions Directive. The implementation period is four years. UPM is benchmarking its production lines against the BAT values.

Environmental core indicators 2019

UPM PAPER MILLS

Scope: all UPM paper mills

	2017		2018		2019	
Production	9,220,000 t		9,060,000 t		8,230,000 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	11,700 GWh	1,300 kWh/t	11,900 GWh	1,300 kWh/t	10,900 GWh	1,300 kWh/t
Steam consumption	10,700 GWh [1]	1,200 kWh/t	10,800 GWh [1]	1,200 kWh/t	10,000 GWh	1,200 kWh/t
Total renewable energy consumption						
Electricity consumption					2,700 GWh	330 kWh/t
Steam consumption					4,300 GWh	520 kWh/t
Material efficiency						
Chemical pulp	2,560,000 t	280 kg/t	2,490,000 t	280 kg/t	2,380,000 t	290 kg/t
Mechanical pulp	1,720,000 t	190 kg/t	1,950,000 t	220 kg/t	1,730,000 t	210 kg/t
Recycled fibre pulp	1,820,000 t	200 kg/t	1,850,000 t	200 kg/t	1,600,000 t	200 kg/t
Minerals	2,280,000 t	250 kg/t	2,150,000 t	240 kg/t	2,030,000 t	250 kg/t
Binder	266,000 t	29 kg/t	257, 000 t	28 kg/t	230,000 t	28 kg/t
Water						
Water intake	217,000,000 m^3	24 m^3/t	222,000,000 m^3	25 m^3/t	202,000,000 m^3	25 m^3/t
Process waste water	99,100,000 m^3	11 m^3/t	96,600,000 m^3	11 m^3/t	94,600,000 m^3	12 m^3/t
COD	27,900 t	3 kg/t	27,400 t	3 kg/t	27,900 t	3 kg/t
TSS	2,600 t	0.3 kg/t	2,700 t	0.3 kg/t	2,400 t	0.3 kg/t
Side-products [2]	[3]		183,000 t	20 kg/t	177,000 t	22 kg/t
Ash			117,000 t	13 kg/t	125,000 t	15 kg/t
Wood residues			62,300 t	7 kg/t	47,900 t	6 kg/t
Others			3,900 t	0 kg/t	4,700 t	1 kg/t
Non-hazardous waste [2]						
Recycling, energy recovery, composting			500,000 t	55 kg/t	468,000 t	57 kg/t
Ash [4]			241,000 t	27 kg/t	207,000 t	25 kg/t
Sludges			200,000 t	22 kg/t	193,000 t	23 kg/t
Others			60,300 t	7 kg/t	67,500 t	8 kg/t
Intermediate storage			8,800 t	1 kg/t	1,900 t	0.2 kg/t
Ash			8,700 t	1 kg/t	1,900 t	0.2 kg/t
Others			20 t	0.002 kg/t	0 t	0 kg/t
Landfill, incineration without energy recovery			43,600 t	5 kg/t	40,800 t	5 kg/t
Ash [4]			17,000 t	2 kg/t	16,200 t	2 kg/t
Sludges and pulp rejects			22,700 t	3 kg/t	9,800	1 kg/t
Others			4,000 t	0 kg/t	14,800 t	2 kg/t
Recycling rate			91%		92%	
Hazardous waste			2,800 t	0.3 kg/t	3,000 t	0.4 kg/t
Emissions to air						
CO_2 fossil	2,780,000 t	300 kg/t	2,630,000 t	300 kg/t	2,600,000 t	320 kg/t
NO_x, as NO_2	3,800 t	0.4 kg/t	3,800 t	0.4 kg/t	3,100 t	0.4 kg/t
SO_2	690 t	0.1 kg/t	740 t	0.1 kg/t	640 t	0.1 kg/t
Particulates	84 t	0.01 kg/t	69 t	0.01 kg/t	34 t	0.004 kg/t

[1] Reporting of energy indicators was changed in 2019.
[2] Reported in dry tonnes.
[3] Reporting of waste data was changed in 2018.
[4] Including ash, which is considered as hazardous waste in the UK.

For indicators for biodiversity and societal issues, please see the mill supplements where e.g. information about the mill area is included. All mill supplements are available at www.upm.com/responsibility.

Environmental core indicators 2019

UPM PAPER MILLS

Scope: EMAS-registered mills

	2017		2018		2019	
Production	8,900,000 t		8,840,000 t		7,850,000 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	11,100 GWh	1,200 kWh/t	11,400 GWh	1,300 kWh/t	10,100 GWh	1,300 kWh/t
Steam consumption	10,100 GWh [1]	1,100 kWh/t	10,300 GWh [1]	1,200 kWh/t	9,300 GWh	1,200 kWh/t
Total renewable energy consumption						
Electricity consumption					2,400 GWh	310 kWh/t
Steam consumption					3,800 GWh	490 kWh/t
Material efficiency						
Chemical pulp	2,510,000 t	280 kg/t	2,450,000 t	280 kg/t	2,343,000 t	300 kg/t
Mechanical pulp	1,720,000 t	190 kg/t	1,840,000 t	210 kg/t	1,629,000 t	210 kg/t
Recycled fibre pulp	1,820,000 t	200 kg/t	1,850,000 t	210 kg/t	1,428,000 t	180 kg/t
Minerals	2,180,000 t	240 kg/t	2,090,000 t	240 kg/t	1,970,000 t	250 kg/t
Binder	254,000 t	29 kg/t	248,000 t	28 kg/t	221,000 t	28 kg/t
Water						
Water intake	194,000,000 m^3	22 m^3/t	199,000,000 m^3	23 m^3/t	180,000,000 m^3	23 m^3/t
Process waste water	91,800,000 m^3	10 m^3/t	90,700,000 m^3	10 m^3/t	85,700,000 m^3	11 m^3/t
COD	27,000 t	3 kg/t	26,600 t	3 kg/t	26,600 t	3 kg/t
TSS	2,500 t	0.3 kg/t	2,700 t	0.3 kg/t	2,300 t	0.3 kg/t
Side-products [2]	[3]		183,000 t	21 kg/t	177,000 t	23 kg/t
Ash			117,000 t	13 kg/t	125,000 t	16 kg/t
Wood residues			62,300 t	7 kg/t	47,900 t	6 kg/t
Others			3,900 t	0 kg/t	4,700 t	1 kg/t
Non-hazardous waste [2]			536,000 t	61 kg/t		
Recycling, energy recovery, composting			498,000 t	56 kg/t	407,000 t	52 kg/t
Ash [4]			241,000 t	27 kg/t	171,000 t	22 kg/t
Sludges			200,000 t	23 kg/t	191,000 t	24 kg/t
Others			57,600 t	7 kg/t	45,300 t	6 kg/t
Intermediate storage			8,800 t	1 kg/t	1,900 t	0.2 kg/t
Ash			8,700 t	1 kg/t	1,900 t	0.2 kg/t
Others			20 t	0.002 kg/t	0 t	0 kg/t
Landfill, incineration without energy recovery			29,500 t	3 kg/t	30,600 t	4 kg/t
Ash [4]			16,400 t	2 kg/t	16,000 t	2 kg/t
Sludges and pulp rejects			9,800 t	1 kg/t	0	0 kg/t
Others			3,400 t	0.4 kg/t	14,500 t	2 kg/t
Recycling rate			93%		93%	
Hazardous waste			2,700 t	0.3 kg/t	2,800 t	0.4 kg/t
Emissions to air						
CO_2 fossil	2,670,000 t	300 kg/t	2,525,000 t	300 kg/t	2,470,000 t	320 kg/t
NO_x, as NO_2	3,400 t	0.4 kg/t	3,400 t	0.4 kg/t	2,800 t	0.4 kg/t
SO_2	620 t	0.1 kg/t	670 t	0.1 kg/t	600 t	0.1 kg/t
Particulates	73 t	0.01 kg/t	58 t	0.01 kg/t	34 t	0.004 kg/t

[1] Reporting of energy indicators was changed in 2019.
[2] Reported in dry tonnes.
[3] Reporting of waste data was changed in 2018.
[4] Including ash, which is considered as hazardous waste in the UK.

For indicators for biodiversity and societal issues, please see the mill supplements where e.g. information about the mill area is included. All mill supplements are available at www.upm.com/responsibility.

Environmental core indicators 2019

UPM CHEMICAL PULP MILLS

Scope: all UPM pulp mills

	2017		2018		2019	
Production	3,700,000 t		3,510,000 t		3,700,000 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	2,100 GWh	600 kWh/t	2,300 GWh	650 kWh/t	2,200 GWh	600 kWh/t
Steam consumption	10,800 GWh	3,000 kWh/t	10,700 GWh	3,100 kWh/t	11,700 GWh	3,100 kWh/t
Total renewable energy consumption [1]			[1]			
Electricity consumption					2,000 GWh	550 kWh/t
Steam consumption					10,800 GWh	2,900 kWh/t
Material efficiency						
Wood	16,100,000 m^3	5 m^3/t	16,000,000 m^3	5 m^3/t	16,400,000 m^3	4 m^3/t
Process chemicals [2]	429,000 t	120 kg/t	409,000 t	120 kg/t	457,000 t	120 kg/t
Water						
Water intake	216,000,000 m^3	61 m^3/t	220,000,000 m^3	63 m^3/t	224,000,000 m^3	61 m^3/t
Process waste water	116,000,000 m^3	33 m^3/t	113,000,000 m^3	32 m^3/t	119,000,000 m^3	32 m^3/t
COD	38,900 t	11 kg/t	35,100 t	10 kg/t	32,200 t	9 kg/t
TSS	1,500 t	0.4 kg/t	1,300 t	0.4 kg/t	1,100 t	0.3 kg/t
AOX	320 t	0.1 kg/t	250 t	0.1 kg/t	290 t	0.1 kg/t
Waste [3]	[4]					
Side-products [3]			3,100 t	1 kg/t	2,800 t	1 kg/t
Green liquor dregs			2,800 t	1 kg/t	1,400 t	0.4 kg/t
Lime			310 t	0.1 kg/t	1,400 t	0.4 kg/t
Non-hazardous waste [3]			150,000 t	43 kg/t	176,000 t	48 kg/t
Recycling, energy recovery, composting			94,900 t	27 kg/t	108,000 t	29 kg/t
Sludges			15,400 t	4 kg/t	15,800 t	4 kg/t
Bark and wood waste			65,800 t	19 kg/t	68,600 t	19 kg/t
Others			13,700 t	4 kg/t	23,200 t	6 kg/t
Intermediate storage			1,900 t	1 kg/t	17,200 t	5 kg/t
Bark and wood waste			1,300 t	0.4 kg/t	350 t	0.1 kg/t
Lime			260 t	0.1 kg/t	200 t	0.1 kg/t
Construction waste			300 t	0.1 kg/t	0 t	0 kg/t
Others			110 t	0.03 kg/t	16,600 t [5]	4 kg/t
Landfill			52,800 t	15 kg/t	51,300 t	14 kg/t
Green liquor dregs			36,600 t	10 kg/t	38,700 t	10 kg/t
Sludges			7,000 t	2 kg/t	5,700 t	2 kg/t
Lime			6,300 t	2 kg/t	0 t	0 kg/t
Others			2,900 t	1 kg/t	6,900 t	2 kg/t
Recycling rate			63 %		61%	
Hazardous waste			770 t	0.2 kg/t	430 t	0.1 kg/t
Emissions						
CO_2 fossil	281,000 t	79 kg/t	323,000 t	92 kg/t	270,000 t	73 kg/t
NO_x, as NO_2	4,800 t	1 kg/t	5,200 t	2 kg/t	5,000 t	1 kg/t
SO_2	190 t	0.1 kg/t	240 t	0.1 kg/t	160 t	0.04 kg/t
Particulates	510 t	0.1 kg/t	740 t	0.2 kg/t	560 t	0.2 kg/t
TRS	77 t	0.02 kg/t	86 t	0.02 kg/t	120 t	0.03 kg/t

For indicators for biodiversity and societal issues, please see the mill supplements where e.g. information about the mill area is included. All mill supplements are available at www.upm.com/responsibility.

[1] Reporting of energy indicators was changed in 2019.
[2] Main chemicals used: oxygen gas, sodium hydroxide, sodium chlorite or chlorate, sulphuric acid, limestone, hydrogen peroxide.
[3] Reported in dry tonnes.
[4] Reporting of waste data was changed in 2018.
[5] 15,200 t of sludge moved from sedimentation basin to intermediate storage field in Pietarsaari.

UPM plays a significant role in contributing 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 cover local societal impacts in addition to the traditionally reported environmental performance. With "societal" we refer both to the socio and economic impacts.

Each mill presents its most important societal impacts in its mill supplement. Many issues are similar to all the mills. The mill supplements provide e.g. information on our contribution to employment, health and safety of employees, tax income and purchasing power, responsible sourcing as well as co-operation with the communities.

Employment

EMAS mills employed directly around 9,700 people in 2019. In addition, significant indirect employment impacts are generated by use of raw materials and services. We have been able to calculate the indirect employment effects for Finnish EMAS mills using a mathematical model developed by the Research Institute of the Finnish Economy (Etla). The model is based on input-output statistics from Statistics Finland. Those statistics show how companies from different industries buy goods and services from each other. The six EMAS production units in Finland generated around 3,940 direct jobs and around 3,870 indirect jobs in the region in 2019.

Health and safety

Our goal in UPM is to be the industry leader in health and safety. Our employees, as well as business partners and their employees, are required to adopt safe work practices and to comply with the rules and standards we have established.

In 2019, in the entire UPM, lost-time accident frequency (LTAF, the number of lost-time work accidents per one million hours of work) was 2.9 (2.7 in 2018). The total recordable injury frequency (TRIF) increased slightly, reaching 7.1 (6.9). The TRIF includes LTA cases as well as cases of modified duties and accidents requiring medical treatment. The frequency of accidents involving UPM's contractors was 3.3 (LTAF) and 6.8 (TRIF) in 2019. The mill specific safety figures can be found in the mill supplements.

We are working closely with employees and external occupational health organisations to support the wellbeing of our personnel. Our aim is to support the continuous improvement of employees' health, quality of life and ability to perform. Our quarterly global health and safety themes focused on e.g. how to stay vigilant and alert at work, how to take care of your personal mental and physical recovery, and how to avoid accidents at home and during your free time. Based on local need, we also launched several health and wellbeing initiatives at various UPM sites and in various businesses, with positive results.

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

Purchasing power

Effects on the consumption generated by the Finnish mills were also calculated by the earlier mentioned Etla's model. Consumption impacts are generated by employees working at the mill and employees working at the value chain of the mill, typically working in other industries. That presents direct and indirect employees' private consumption of commodities through net income. Consumption impact generated by the six EMAS sites in Finland in 2019 was around EUR 180 million locally and EUR 340 million nationally.

Tax impact

Tax income generated by our business operations is an essential part of our societal impact as the tax income strengthens the vitality of the local community and supports public services. UPM pays corporate income taxes in the countries where added value is created and profit is generated. Based on UPM's corporate and operational structure, UPM reports and pays its corporate income taxes mainly in countries where production activity takes place and where innovations are developed. In 2019, entire UPM's corporate income taxes paid and property taxes were approximately EUR 211 million in total (EUR 283 million in 2018).

In addition to the taxes on income, UPM's various production inputs and outputs are also 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 the local community in many ways. Municipal share of corporate income taxes and real estate taxes paid by UPM support the economy of the local community. In addition, the income taxes on salaries and social security contributions paid by UPM employees have also a significant local impact. Local tax impact figures are presented in the EMAS mill supplement for China, Austria, Uruguay and Finland. Those nine EMAS mills in their respective municipals/countries generated in total approximately EUR 205 million local tax impact (when including e.g. the above mentioned local taxes). EMAS mills in the UK and Germany have not published their local tax footprint in 2019 mill supplements, but in Germany, the 6 EMAS mills generated in total around EUR 120 million local tax impact 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 the communities close to our operations through active co-operation and open dialogue with local stakeholders as well as, for example, through sponsorships and employee volunteering under the umbrella of our Biofore Share and Care programme. The four focus areas of UPM's Biofore Share and Care programme are: Reading & learning, engaging with communities, responsible water use and boosting bioinnovations.

The mills' engagement with the local communities are for example cases in which support has been given to the local educational institutions and associations or community consultation via regular roundtables with local stakeholders. Details about the mills' engagement activities can be found from the mill supplements.

Responsible sourcing

UPM is committed to responsible sourcing practices throughout the entire supply chain. We work closely with our suppliers to ensure that our suppliers understand and meet all of the company's requirements. UPM requires its suppliers to comply with the UPM Supplier and Third Party Code that defines suppliers' minimum requirements in terms of responsibility with regard to matters such as environmental impact, human rights, labour practices, health and safety, product safety, corruption and bribery.

UPM's target is to have 100% of raw material spend and 80% of all spend qualified against UPM Supplier and Third Party Code by 2030 (Qualified spend). In 2019, 94% of UPM's raw material spend and 84% of all spend was qualified against the UPM Supplier and Third Party Code.

Glossary

Activated sludge process
A three-stage biological effluent treatment method.

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

BAT, Best available techniques
The best available technology that allows for solutions that are technically, economically and environmentally the most efficient and advanced.

BOD, Biological oxygen demand
COD, Chemical oxygen demand
The effluent, or waste water of pulp and paper mills includes organic substances which consume oxygen during biodegradation. Low oxygen content in fresh and sea water 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
Combustion product of carbon. Fossil carbon dioxide emissions arise from fossil fuels like coal, oil and petrol.

CHP, Combined heat and power technology
Combined heat and power (CHP) production (or cogeneration) is when both electricity and heat are produced at a thermal power plant. The heat is used, for example, in industry or district heating, or as process steam.

Chain of Custody (COC)
An unbroken trail of documentation to guarantee the identity and integrity of the data used as, for example, in demonstrating the origin of wood.

Chemical pulp
Generic name for wood-based fibres separated from each other by "cooking" wood chips or plants in hot alkaline or acidic solutions of various chemicals.

Consumption impact
Consumption through net income generated by employees working at the plant and employees working at the value chain of the plant (typically working in other industries). Calculated using a model build by The Research Institute of the Finnish Economy (Etla).

Deinking
The process whereby the ink and impurities are removed from recovered paper.
Deinked pulp: see recycled fibre pulp.

EMAS, Eco-Management and Audit Scheme
Voluntary environmental management system for companies and other organisations to improve, evaluate and report on their environmental performance on an annual basis. The environmental review is approved by a third-party accredited EMAS verifier.

Forest certification
An independent review process that determines whether a forest is managed in a responsible manner. 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, e.g. newspapers, magazines, catalogues and copy paper.

ISO 9001
Quality management system standard published by the International Organisation for Standardisation (ISO).
This is a voluntary, international and third-party certified system.

ISO 14001
Environmental management system standard published by the International Organisation for Standardisation (ISO). This is a voluntary, international and third-party certified system.

ISO 50001
Energy management system standard published by the International Organisation for Standardisation (ISO). This is a voluntary, international and third-party certified system.

ISO 22001
Food Safety management system standard published by the International Organisation for Standardisation (ISO). This is a voluntary, international and third-party certified system.

Lost-time accident frequency (LTAF)
Lost-time accidents per million hours worked. Calculation is as follows: (The number of accidents at work resulting in absence or disability 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 workforce (including UPM employees and supervised workers) and 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. 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, in turn, is precipitated as "acid rain". This nitrogen-containing rain also has a fertilising effect, i.e. eutrophication.

OHSAS 18001
Specifications for an Occupational Health and Safety Management System.

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

SO_2, Sulphur dioxide
This gas is generated by burning sulphur-containing fuels. On 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 that defines suppliers' minimum compliance requirements in terms of responsibility with regard to matters such as environmental impact, human rights, labour 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 not currently available for each mills, but only for regions.

Sustainable forest management
In the longterm, a sustainably managed forest means that it is not harvested more than it grows. Sustainably managed forests maintain their biodiversity, productivity, regeneration capacity, vitality and their potential to fulfil (now and in the future), relevant ecological, economic and social functions, at local, national and global levels without damaging other ecosystems.

Total Recordable Injury Frequency (TRIF)
Recordable injuries per million hours worked. Calculation is as follows: ('LTA at work excluding contractors (number of LTAs which are one or more days)'+'Modified duty'+'Medical treatment')/'Actual hours worked (UPM)'*1,000,000. Total Recordable Injury type excludes first aid cases. UPM reports separately for workforce (including UPM employees and supervised workers) and contractors.

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

TSS
TSS are solid materials, including organic and inorganic, that are suspended in the water.

Revalidation statement

As accredited or licensed environmental verifiers,
- BSI (UK-V-0002) for Caledonian and Shotton
- Inspecta Sertifiointi Oy (FI-V-0001) for Changshu, Fray Bentos, Jämsä River Mills, Kaukas, Kymi, Pietarsaari, Rauma and Tervasaari
- Quality Austria (AT-V-0004) for Steyrermühl
- TÜV NORD CERT Umweltgutachter GmbH (DE-V-0263) for Augsburg, Ettringen, Hürth, Nordland, Plattling and Schongau

have examined the environmental management systems of each mill mentioned above, the information contained in the updated Environmental and Societal Responsibility 2019 reports, 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 Updated UPM Corporate Environmental and Societal Responsibility Statement 2019 on 03/08/2020 Inspecta Sertifiointi Oy as the coordinating environmental verifier of this common EMAS validation herewith confirms that the environmental management systems and the Updated UPM Corporate Environmental and Societal Responsibility Statement 2019 together with the updated Environmental and Societal Responsibility 2019 reports comply with the requirements of the EU's EMAS regulation (EC) No. 1221/2009.

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