

UPM Changshu

ENVIRONMENTAL AND SOCIETAL RESPONSIBILITY 2021



UPM Changshu

UPM Changshu paper mill is situated at Changshu Economic & Technological Development Zone against south bank of Yangtze River, approximately 90 km west of Shanghai. The mill is a subsidiary of UPM - Kymmene Corporation.

Founded in 1995, the mill started its operation in early 1999. Currently, the mill has three paper machines producing both wood-free fine paper and specialty paper. Pulp, used as the main raw material for paper-making, is exclusively sourced from sustainably managed forests. In fine paper production, calcium carbonate is used as a filler of paper and kaolin is applied for coated paper as a pigment. Filler is not used in the production of specialty paper grades.

The mill is also equipped with auxiliary facilities including an in-house thermal power plant, a fresh water plant and a wastewater treatment plant. These facilities supply electricity, steam and fresh water for paper-making and purify the wastewater and other wastes from the production processes. Water used for paper production is taken from the Yangtze river. The water is purified before being discharged back into the river.

In addition to the paper mill, UPM Changshu site accommodates other two UPM units, UPM Asia R&D Centre and UPM Raflatac label plant. The scope of this report includes UPM Asia R&D Center which was merged with paper mill in 2012, but excludes UPM Raflatac label plant.



UPM Changshu Environmental and Societal Responsibility 2021 is a supplement to the Corporate Environmental and Societal Responsibility Statement of UPM's pulp and paper mills (available at www.upm.com) and provides mill-specific environmental and societal performance data and trends for the year 2021. The annually updated mill supplements and the UPM Corporate Environmental and Societal Responsibility Statement together form the joint EMAS Statement of UPM Corporation. The next Updated UPM Corporate Environmental Statement and also this supplement will be published in 2023.



UPM delivers renewable and responsible solutions and innovates for a future beyond fossils across six business areas: UPM Fibres, 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 17,000 people worldwide and our annual sales are approximately EUR 9.8 billion. Our shares are listed on Nasdaq Helsinki Ltd. UPM Biofore – Beyond fossils. www.upm.com

Production capacity	1,220,000 tonnes		
Personnel	1,111		
Products	Office Paper: UPM Jetset® UPM Copykid® UPM Yes® UPM Office® UPM Future®	UPM Jincopy® UPM Colormax® UPM Horizon® UPM Soho® UPM Excellent Print®	Graphic Paper: UPM Finesse Classic Matt UPM Finesse Classic Gloss UPM Finesse Bulky Matt UPM Fine UPM Fine NW
			Specialty Paper: UPM Brilliant™ UPM Blue™
Side products	Ammonia sulfate		
Certificates	EMAS – EU Eco Management and Audit Scheme ISO 14001 – Environmental Management System ISO 45001 – Occupational Health and Safety Management System ISO 9001 – Quality Management System ISO 50001 – Energy Management System PEFC Chain of Custody – Program for the Endorsement of Forest Certification FSC® Chain of Custody – Forest Stewardship Council CFCC – China Forest Certification Council Jiangsu High Technology & Innovation Enterprise China Work Safety Certification level II		
	Some certificates can be found from UPM's Certificate Finder (available at www.upm.com/responsibility) >Principles and Performance > Certificate finder		
Environmental labels	China Green Label for copy paper Singapore Green Label for copy paper		



For FSC products, visit www.fsc.org



For PEFC products, visit www.pefc.org



Cert. No.: 05508P1054001R1M

Review of year 2021

UPM Changshu paper mill is committed to continuously improving its environmental and societal responsibility performance. As a world-class paper maker, environmental protection and sustainable development are our key cornerstones in our everyday activities.

Achievement of target

The environmental targets set by the mill in 2021 had all been achieved without any discount. The mill did not have any environmental deviations affecting the external environment. Environmental targets include but are not limited to Clean Run deviations, employee observation reports on environmental risks, energy and water savings.

Continuous improvement in 2021

The mill's environmental emission levels were within the optimum ranges as indicated by Best Available Techniques (EU BAT BREF 2014). Despite good results, efforts continued to be made in 2021 in order to further reduce emissions as well as water and energy consumption.

Wastewater treatment plant has been invested to modify Aeration basin to control the expansion of filamentous bacteria sludge. This change improves the purification process and making the process more stable.

Power plant area completed modification of 2 package boilers to reach the super-low nitrogen oxide emission limits. Phosphorus containing wastewater from the boilers has been collected and transferred to wastewater treatment plant.

In the paper mill, chemical oxygen demand (COD) and pH online instruments are installed at the rainwater outlet to monitor the rainwater condition in real time. If there is any abnormal situation, it can be dealt with in time.

Changshu mill tried using sulfate which product by own desulfurization as recyclable nutrients for Wastewater treatment, and further study is ongoing.

With stable and efficiency operation in 2021, The mill's total annual water consumption was reduced by 3.6% in 2021, specific process wastewater decreased 2.6%, and total phosphorus (TP) as well as total nitrogen(TN) in wastewater were 55.5% and 2.8% less than in year 2020, respectively.

We have also achieved a significant improvement in air protection as the acidifying gas was 20.6% lower compared to 2020. The mill's total specific energy consumption was reduced 3.3% in 2021. Nevertheless, the future energy structure development and renewable energy studies are on-going.

Awards and recognitions

In 2021, the mill was awarded as advanced collective of energy saving and emission reduction by Changshu Municipal Government and also recognized as an Environmental Frontrunner by Changshu Economic & Technological Development Zone.

Environmental Monitoring

The following environmental monitoring activities are performed in the mill area:

- A. Sampling of Yangtze River water quality nearby the mill by Changshu Water Bureau on a bi-monthly basis and sampling by Suzhou Ecological & Environmental Bureau on a monthly basis
- B. Measurement of mill wastewater
 - pH, COD, TSS, BOD₅, P, N, NH₄-N and color (daily by mill

- laboratory)
 - flow, pH, COD, NH₄-N, TN and TP (24h-7d/w non-stop by on-line meters)
 - pH, COD, TSS, BOD₅, P, N, NH₄-N, AOX, and color (monthly test by third party)
 - All elements above are sampled by the authority quarterly or at random
 - Mill area rainwater is tested quarterly by an external laboratory
- C. Air emission (mill boiler stack)
 - SO₂, NO_x, particulates and CO₂ (24h-7d/w non-stop measurement)
 - SO₂, NO_x, and particulates (quarterly sample tested by third-party and randomly by authority)
- D. Quarterly test were done for mill border noise by third-party
- E. Randomly site inspections by local environmental authority



王志强

Mr. Steven Wang
Mill EHS Director



Jukka Saarelainen

Mr. Jukka Saarelainen
Mill General Manager

Responsibility figures 2021



Waste

99.9%

of mill solid wastes are reused, recycled or incinerated with heat recovery.

0 process waste

to landfill was achieved in 2021.



Air

20.6%

of acidifying gas and

8.1%

of CO₂ were decrease achieved from 2021.



Energy

Total specific energy consumption was decreased

3.3%

by 2021.



Supply chain

99.7%

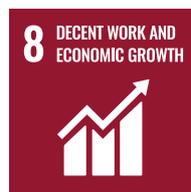
of raw materials spend covered by UPM Supplier and Third Party Code (wood not included).



Certified Fibre

84%

of fibre used in paper production was FSC® and/or PEFC certified. UPM's target is to use only certified fiber by 2030.



Employment

1,111 personnel

directly employed by UPM Changshu mill.

In addition, there were 260 full-time service people and 55 interns working at UPM Changshu mill site.

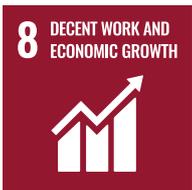


Water

Mill total process water consumption was

3.6%

less and 2.4% reduction of process wastewater in 2021. There were also consequently 55.5% of total phosphorus (TP) and 2.8% of total nitrogen (TN) decrease comparing with 2020.

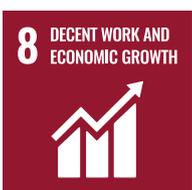


Community

Due to COVID-19 pandemic, societal activities at school and community were less than before, but more than

300

students and local citizens participate in local environmental events supported by UPM.

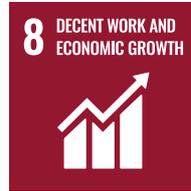


Health

Annual health check covered

100% mill employees

and zero occupational illness was reported in 2021.



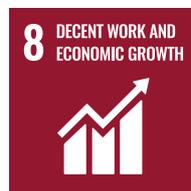
Safety

99%

of safety incident handled within 6 weeks from initial reporting.

98%

actions closed where proactive actions which were required as a result of all incidents, safety walks etc. carried out in 2021.



Taxes

Annual contributions to China government was

39 million USD

Including:

- State taxes (Corporate income tax)
- Local taxes (Real estate tax, Land use tax, Environmental protection tax, Stamp duty and Local levies)
- Customs duty on imported materials and equipment
- Individual income tax and social security contributions for UPM China employees
- (indirect contributions through employment)

UPM Changshu Mill's power plant is a combined heat and power (CHP) plant. It is equipped with two coal fueled boilers rated at 241t/h each and four gas boilers rated at 56t/h each. The power plant produces electricity and steam for paper production. In supplement to the in-house capacity, external electricity and steam are occasionally purchased to cover any shortages. The gas boilers are only used occasionally for steam production during the overhaul of the coal-fueled boilers.

The coal-fueled boiler's flue-gas is purified through denitrification, desulphurization and particulate removal processes.

Two package-boilers had been successfully completed super-low NOx emission modification in late 2021 to ensure the emission can reach standard during coal-fueled boiler shut down. Nine diesel forklifts were replaced with electric forklift and others were installed the dust catcher to reduce air pollution.

In China, local and national authorities limit air pollutant emissions for industrial enter-

prises by the total volume and unit concentration, as specified in the table below. The emission quotas were based on the mill's existing boiler capacity and authority permitted limits of pollutant concentration.

Air emission quota permits 2021 (t/a)

Nitrogen oxides, NOx	435.1
Sulphur dioxide, SO ₂	217.6
Particulates	86.9

Super-low air emission Permit (*mg/nm³)

Nitrogen oxides, NOx	50
Sulphur dioxide, SO ₂	35
Particulates	10

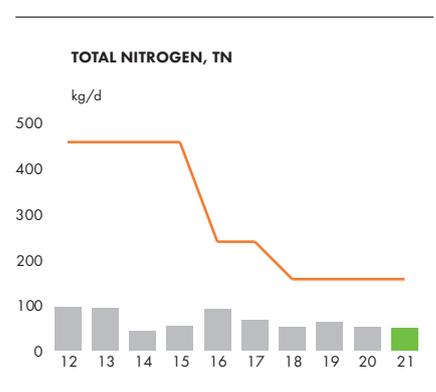
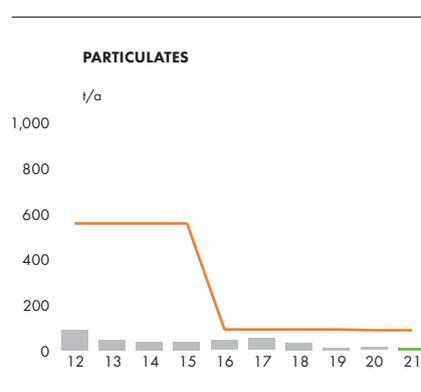
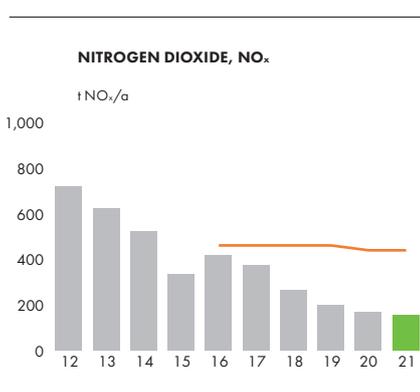
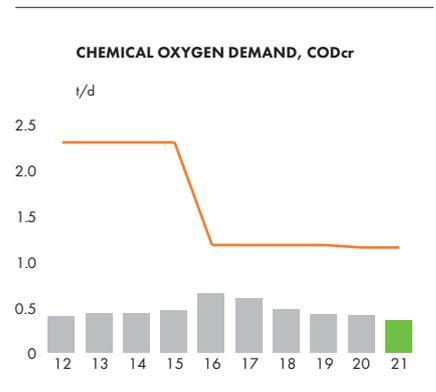
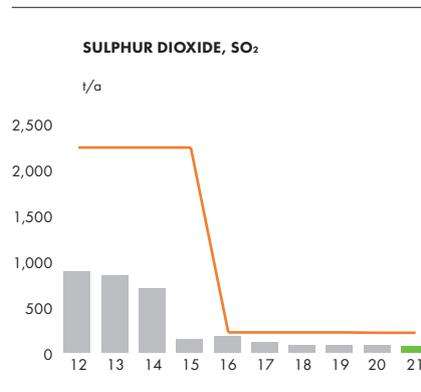
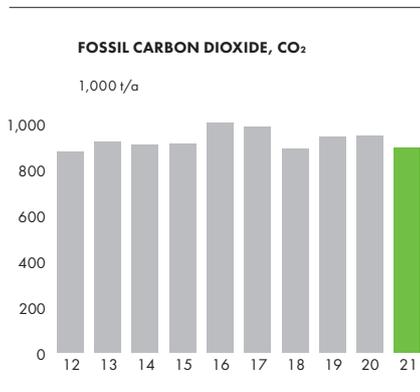
**Hourly limit values for thermal power plant emissions required by government*

The designed capacity of the mill's wastewater treatment plant (WWTP) is 26,400 m³/d. The processes mainly consist of pre-sedimentation, bio-activated sludge stage, anoxic denitrification and finally the disc filtration processes.

The wastewater treatment plant continues to maintain excellent operation throughout the year, and most of the wastewater pollutant indicators were significantly lower than the permit values in 2021.

Online monitoring measures was installed in paper machine 3 rainwater outlet to monitor COD and pH in real-time. In addition, an investment of WWTP optimization for low COD load was implemented successfully to keep effluent plant flexible for constant low COD load and ensure effluent stable performance.

Limits for both the quantity and the concentration of the water pollutants for industrial enterprises are set by local and national Chinese authorities (quantity is set by local authority on bases of production capacity and concentration is specified in the table



Remark 1: Above measurements are done according to Chinese standards which are derived from ISO standards, but they might not be fully comparable.
 Remark 2: NOx are monitored by measuring NO and calculated into NO₂

— Permit limit



Waste

of "Discharge Standard of Water Pollutants for Pulp & Paper Industry", standard code GB3544-2008).

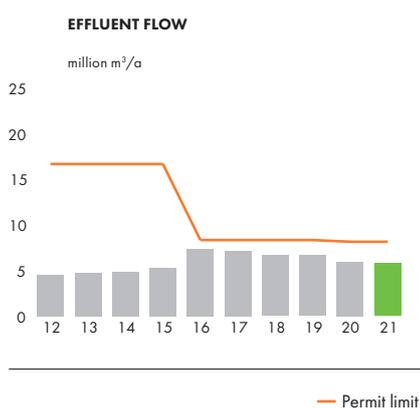
Water pollutant quota permits (t/a)

Chemical oxygen demand, COD _{Cr}	408.18
Total suspended solid, TSS	81.64
Total nitrogen, TN	54.63
Total phosphorus, TP	2.732

Water pollutant concentration permits (* mg/l)

Chemical oxygen demand, COD _{Cr}	50
Total suspended solid, TSS	10
Total nitrogen, TN	10
Total phosphorus, TP	0.5

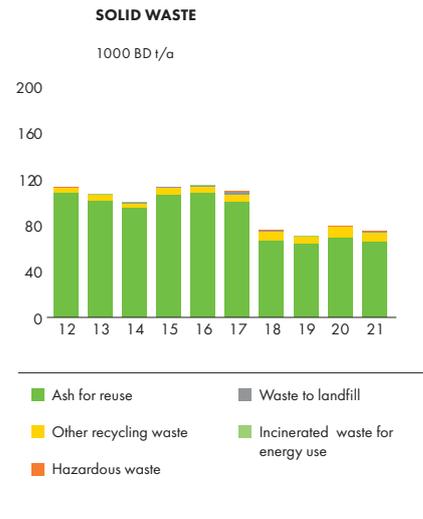
*Hourly average values stipulated in Standard GB3544-2008



— Permit limit

Solid waste from the mill is mainly derived from boiler ashes, waste packaging, maintenance waste and a small amount of non-recyclable waste. Waste is 99.9% recycled or reused. Non-recyclable waste is incinerated or landfilled. The landfill site is located 30 km west of the mill. The site is rented and operated by a private company with a legal license. The combustible non-hazardous waste from the mill is incinerated in an external power plant with energy recovery. A small amount of hazardous waste is treated by qualified environmental companies in compliance with relevant laws and regulations. A majority of effluent sludge is incinerated by the mill's in-house boilers as biofuel. Ash is already used in construction materials and now the trial is continued for using effluent sludge to make construction material.

For better management of hazardous waste, government has launched a new management system: Full life cycle monitoring system in mid-2021. CSU mill implemented the conversion of old and new system timely and smoothly.



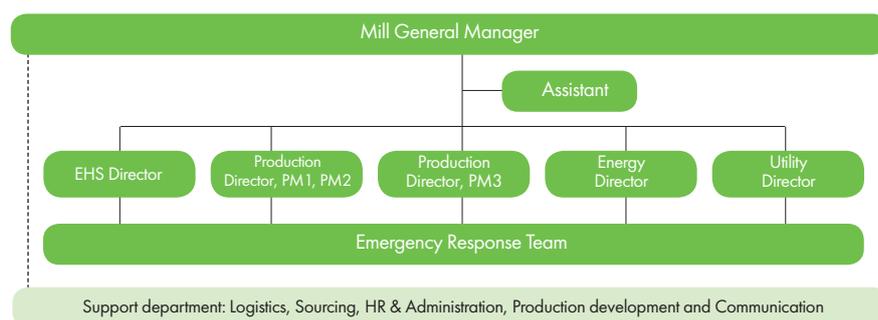
Remark: The weights included in the figures besides hazardous waste. The rate calculation of waste reused, recycled or incinerated with heat recovery has covered all recyclable waste, nonrecyclable waste, hazardous waste and side-product.

Organizational structure and emergency organization

Changshu Mill's organization structure and emergency response team are well defined with responsible persons nominated according to government regulations. Emergency response procedures are also established and communicated with all employees in response to any kind of emergencies such as fire, environmental deviation, safety accident, individual injury as well as natural disaster. The goal is to achieve a quick response and to minimize the losses possibly caused by emergency incidents by means of immediate and well-organized reactions.

Under the mill emergency management organization, there is an emergency response team (ERT) whose members come from each workshop and shift. Annual wastewater emergency drill was carried out to respond to sudden, but unlikely, wastewater deviation.

In addition, there are designated representatives responsible for the integrated management system (occupational health & safety, environment, quality and energy).



UPM Changshu Social Responsibility

UPM places emphasis on economic, social and environmental responsibility in its daily operations, and aims to be a leader in sustainable development. UPM Changshu Paper Mill attaches significant importance to social responsibility.

In 2021, the global pandemic is still raging and raising challenges to businesses. With decisive measures we ensured the safety of UPM employees and the satisfactory performance of the company.

Occupational health and safety

The UPM Changshu Paper Mill is committed to developing a world-class safety culture and being a safe, fair and responsible employer. Safety is the priority of our daily work, and is put in the first place in any UPM Changshu Social Responsibility circumstances any time. In 2021, UPM Changshu Paper Mill has 7 total injured incidents, total injured incidents frequency is 3.5, less than UPM group target 4.2. All UPM employees, suppliers, contractors and visitors are required to strictly comply with UPM safety standards. Rigorous management and trainings are conducted to avoid accidents and to provide a safe working environment.

Since 2012, UPM Changshu mill has been organizing Health and Safety Week activities for 10 consecutive years, the 2021 "Health and Safety Week" was successfully held in June. Employees, contractors and third-party personnel actively participated in 13 online and offline activities. The "Dynamic Safety Analysis Tool" was launched to encourage employees to use STAR (Stop, Think, Act, Review) mode at work, to identify potential risks or hidden dangers at different

stages of the operation, make correct judgments and decisions according to own experience and skills, and continue to ensure everybody's safety. It is particularly worth mentioning that as of June 13, 2021, PM 1 has set a new record of 5,000 safety days with no accident.

In October, the second "Environmental Week" was organized to enhance the Clean Run and environmental protection awareness of UPMers, aiming higher in improving energy efficiency and reducing carbon emissions, and ensure the attainment of group 2030 goals.

In 2021, UPM was awarded as the "Top Employer in China" for the tenth time. This is a recognition of UPM's long-term commitment to developing a safe, healthy and inspiring working environment in which people can participate and grow as professionals.

UPM focuses on long-term career development, emphasizing performance and employee engagement. The smooth two-way communication stimulates staff professionalism, 47.5% of employees in China have worked for UPM for more than 10 years, while more than 18.6% of employees in China have been with the company for more than 20 year.

In order to enrich employees' spare time, employee clubs have organized team building activities and public welfare activities, such as tree planting, poetry recitation and hiking trips in order to continuously improve the physical and mental health of employees and enable them to enjoy a high quality life.

Contribution to local society

In 2021, UPM was awarded as the "Top 100 Taxpayers in 2020" in Changshu, ranked ninth. In the same year, we also won the "Outstanding Tax Contribution Award for Foreign-invested Enterprises".

UPM has successfully carried out school-enterprise cooperation with local vocational and technical schools in Changshu for more than ten years. UPM Changshu Mill has become an off-campus training base for Binjiang Vocational and Technical School, providing students with strong career support.

In October 2021, UPM actively supported the "Healthy Jiangsu – Environment and Health" Science Popularization Program in Changshu, to popularize environmental knowledge among local residents and improve public health awareness.

Stakeholder engagement

UPM's compliance with laws and regulations - in particular, competition and anticorruption laws - lays a solid foundation for us as a trusted business partner, and our responsible



UPM actively supported the "Healthy Jiangsu – Environment and Health" Science Popularization Program



In 2021, UPM was awarded as the "Top Employer in China" for the ninth time.

SUPPLIER MANAGEMENT INFORMATION

Total number of contracted suppliers	322
– Direct raw material suppliers	54
– Other material and service suppliers	236
– Transportation service providers	15
Number of suppliers been audited on-site in 2021 (including TFS* audit)	13
Number of suppliers to be audited in 2022	22

*TFS: Together for Sustainability (TFS), a joint initiative and global network of chemical companies, delivers the de facto global standard for environmental, social and governance performance of chemical supply chains. UPM joined TFS initiative in 2018 and scaled up the supplier evaluation with TFS network in 2020.



UPM Changshu mill holds the second "Environmental Week"

and ethical practices create long-term value for both UPM and its stakeholders.

Supplier audits are an integral part of responsible sourcing. UPM requires its suppliers to adhere to the "Supplier and Third-Party Codes" that defines the minimum compliance requirements for suppliers in terms of responsibility including environmental impact, human rights, labour practices, health and safety, and product safety. Suppliers' environmental and social performance is monitored through regular data collection and analysis.

As the pandemic is normalizing today, the entire supply chain shoulders arduous responsibilities. At the UPM Supplier Conference in 2021, we shared our corporate strategy and future vision with suppliers, to jointly respond to the challenges of the new normal. In the same year, UPM Specialty Papers APAC Sourcing team was awarded "Sustainability for the Future Award" for the TOP Procurement Success Initiative in the Procurement Success Summit (PSS).

In 2021, UPM Specialty Papers announced its new customer promise, "Special by

Nature", hoping to make sustainability as competitive advantage for customers and meet consumer demand for better and more responsible products.

In the context of global warming and China's "3060 dual-carbon" strategy, in 2021, UPM and China's paper industry jointly launched the "Dual Carbon Action", to promote a green, low-carbon and sustainable future for China's pulp, paper, and paper packaging industry.

In 2021, the new UPM Asia Biofore Base® (renewed Asia R&D Center) started up in Changshu. In the future, it will cooperate closely with customers, universities, research institutions and suppliers, to provide innovative and sustainable solutions.

UPM promotes responsible practices throughout the value chain and is actively finding sustainable solutions in co-operation with its customers, suppliers and partners. Guided by the new brand promise "Beyond Fossils", inspired by the new many opportunities of the bio-economy, UPM is delivering renewable and responsible solutions, and innovating for a future beyond fossils.



UPM Specialty Papers APAC Sourcing team was awarded TOP Procurement Success Initiative for the Sustainability for the Future Award

Environmental parameters 2021

The figures related to production as well as raw material and energy consumption are published as aggregated figures on group level in the UPM Corporate Environmental Statement.

		2019	2020	2021
Production capacity	Wood-free fine and specialty paper	1,400,000 t	1,220,000 t	1,220,000 t
Raw materials and additives	Pulp Fillers and coating pigments Chemicals for paper production Others	See UPM Corporate Environmental and Societal Responsibility Statement for more information		
Energy	Fossil and biomass-based fuels Purchased power	See UPM Corporate Environmental and Societal Responsibility Statement for more information		
Emissions to air	Particulates	11 t	13 t	12 t
	Sulphur dioxide, as SO ₂	86 t	81 t	69.4 t
	Nitrogen oxide, as NO _x	201 t	166 t	154.7 t
	Carbon dioxide, as CO ₂ (fossil)	946,342 t	950,868 t	895,182 t
Water intake	Process and cooling water including power plant use	11,133,921 m ³	10,273,704 m ³	9,949,225 m ³
	Municipal water	372,491 m ³	107,550 m ³	61,233 m ³
Discharges to water	Clean cooling water	237,250 m ³	237,900 m ³	237,250 m ³
	Process effluent volume	6,636,141 m ³	5,911,987 m ³	5,768,894 m ³
	BOD ₅	33.4 t	40.4 t	29.7 t
	COD _{cr}	147 t	143 t	126.1 t
	Solids	47 t	44 t	46.2 t
	Phosphorus, P	0.4 t	0.4 t	0.2 t
	Nitrogen, N	22 t	18 t	17.5 t
Side-product	Ammonia sulfate	3,684 t	4,336 t	4,030 t
Non-hazardous waste ¹⁾	Waste to recycling, energy recovery and or composting (see below for breakdown)	71,312 t	78,676 t	74,124 t
	– Boiler ash	63,952 t	68,865 t	65,143 t
	– Sludge	778 t	3,263 t	3,962 t
	– Wood waste	259 t	262 t	260 t
	– Paper and board	2,841 t	2,142 t	1,825 t
	– Metals	2,567 t	2,533 t	1,933 t
	– Other recycling waste	620 t	1,159 t	854 t
	– Domestic waste	295 t	245 t	147 t
	Waste to landfill	157 t	30 t	72 t
	– Construction and maintenance waste	157 t	30 t	72 t
	– Production process waste	0 t	0 t	0 t
Hazardous waste		159 t	177 t	133 t
Size of mill area	Total use of land	184.5 ha	166 ha	166 ha
	Total sealed area		52 ha	52 ha
	Total nature-oriented area		114 ha	114 ha

¹⁾ All waste are dry weight



Performance against the targets in 2021

TARGET	ACHIEVEMENT	COMMENTS
1 Clean Run deviations - Category 5 (severe) = 0 - Category 4 (major) = 0 - Category 3 (medium) = 0 Clean Run observations \geq 150 reports	Yes Yes Yes Yes	Actual results 0 0 0 180 reports achieved
2 Occupational, health and safety - Number of total recordable injuries (TRI) \leq 2	No	TRI=7
3 Low incoming COD load debottleneck project implemented at WWTP	Yes	Project was completed in December 2021
4 Mill-wide energy and water saving targets versus 2020 results - Electricity reduction by 0.5% per unit product - Steam reduction by 0.5% per unit product - Water usage reduction by 2% per unit product	No Yes No	Energy and water saving target were not realized due to PMs low efficiency. 1.6% actual increased 1.6% cut because of less heating steam using by optimizing paper content. 1.0% consumption increased

Targets for year 2022

TARGET	MEASURES	RESPONSIBLE PERSON
1 Clean Run deviations - Category 5 (severe) = 0 - Category 4 (major) = 0 - Category 3 (medium) = 0 Clean Run observations \geq 141 reports	Improving all employees' environmental awareness by annual trainings and launch of "Environmental Week" activities.	All employees
2 Occupational, health and safety Number of total recordable injuries (TRI) \leq 4	- Management of change (MOC) training and implementation - Dynamic risk assessment implementation (e.g. mobile vehicle, work at height) ones per month for each employee. - Operation process safety risk recognition & mitigation	Mill EHS director and Dept. head
3 Power Plant gas boilers low NOx emission project completed	To modify gas boilers' burners to reduce NOx emission.	Energy & Utility manager and project manager
4 Mill-wide energy and water saving targets versus 2022 results - Total energy consumption reduction by 1.5% - Process wastewater usage reduction by 10% per unit product	- Water and energy saving teams has meeting every 2 months to discuss possibilities and decide on actions on the energy and process waste waters saving potentials.	Production managers



VALIDATION STATEMENT

As an accredited environmental verifier (FI-V-0001), Inspecta Sertifiointi Oy has examined the environmental management system and UPM Mill name Environmental and Societal Responsibility 2021 statement as well as the information concerning UPM Mill name in the Updated UPM Corporate Environmental and Societal Responsibility Statement 2021.

On the basis of this examination, the environmental verifier has herewith confirmed on 2022-04-29 that the environmental management system, the UPM Mill name Environmental and Societal Responsibility 2021 statement and the information concerning UPM Mill name in the Updated UPM Corporate Environmental and Societal Responsibility Statement 2021 are in compliance with the requirements of the EMAS Regulation (EC) No 1221/2009.



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