

**UPM Changshu**

# ENVIRONMENTAL AND SOCIETAL RESPONSIBILITY 2018



# UPM Changshu

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

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 addition, in fine paper production, calcium carbonate is used as a filler of paper and kaolin is applied for coated paper as a pigment. In specialty paper production, filler is not used.

The mill is also equipped with auxiliary facilities including an in-house thermal power plant, a fresh water plant and a waste water treatment plant. These facilities supply electricity, steam and fresh water for paper-making and purify the waste water and other wastes from the production processes. Water used for paper production is taken from and discharged after purification to the Yangtze 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. UPM Raflatac label plant is excluded in the scope of this report.



UPM Changshu Environmental and Societal Responsibility 2018 is a supplement to the Corporate Environmental and Societal Responsibility Statement of UPM's pulp and paper mills (available at [www.upm.com](http://www.upm.com)) and provides mill-specific environmental and societal performance data and trends for the year 2018. 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 UPM Corporate Environmental and Societal Responsibility Statement and also this supplement will be published in 2020.



UPM leads the forest-based bioindustry into a sustainable, innovation-driven, and exciting future beyond fossils. We deliver renewable and responsible solutions to the growing global consumer demand across six business areas: UPM Biorefining, UPM Energy, UPM Raflatac, UPM Specialty Papers, UPM Paper ENA and UPM Plywood. We serve our customers worldwide. The group employs around 19,000 people and its annual sales are approximately EUR 10.5 billion. UPM shares are listed on NASDAQ OMX Helsinki. UPM – The Biofore Company – [www.upm.com](http://www.upm.com)

<b>Production capacity</b>	1,400,000 tonnes		
<b>Personnel</b>	1,267		
<b>Products</b>	Office Paper Products: UPM Jetset UPM Copykid Yes Future	UPM Office SOHO Horizon Excellent Print	Graphic Paper Products: UPM Finesse Classic Matt UPM Finesse Classic Gloss UPM Fine
			Specialty Paper Products: UPM Blue UPM Brilliant
<b>Certificates</b>	EMAS – EU Eco Management and Audit Scheme ISO 14001 – Environmental Management System ISO 9001 – Quality Management System OHSAS 18001 – Occupational Health and Safety System ISO 50001 – Energy Management System PEFC™ Chain of Custody – Programme 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 All certificates can be found from UPM's Certificate Finder (available at <a href="http://www.upm.com/responsibility">www.upm.com/responsibility</a> ) >Principles and Performance > Certificate finder		
<b>Environmental labels</b>	China Green Label for copy paper Singapore Green Label for copy paper		
<b>Awards</b>	Jiangsu provincial energy saving company Jiangsu Provincial Smart Factory - PM1 workshop		



The mark of responsible forestry

For FSC products, visit [www.fsc.org](http://www.fsc.org)



For PEFC products, visit [www.pefc.org](http://www.pefc.org)



Cert. No.: 05508P1054001R1M



国家环境友好企业  
China Environment Friendly Enterprise

# Review of year 2018

The UPM Changshu paper mill is committed to the continuous improvement of its environmental and societal performance. During the past year, the mill has made good development in sustainability by optimising management systems and by investing in best available technologies.

## Achievement of targets

The mill reached all Clean Run targets for 2018. The Clean Run targets include zero Clean Run deviations, completion of environmental improvement projects, as well as the water and energy reduction targets. In addition, the mill's safety and societal targets were also fulfilled with good results.

## Improved results in 2018

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 2018 in order to further reduce emissions as well as water and energy consumption. As a result, the consumptions per tonne of paper were decreased by 6.9% for water, 3.2% for electricity and 2.8% for heat year-on-year. Reduction in fresh water consumption has consequently reduced the mill's total wastewater flow by 6% year-on-year, which can be considered a significant improvement. Meanwhile, most of water related pollutants discharge had been reduced as well. The successful operation of super-low emission project has brought significant reduction of acidic gases and particulates in boilers' flue-gas.

## Environmental investments continued

Changshu mill's coal-fueled boiler's flue-gas super-low emission project, which started in 2017, was finished successfully on schedule in November 2018. The test report has shown a significant reduction of air pollutants emitted. After modification the emissions are now clearly below super-low emission levels, the lowest air emission permit limits in China to be effective for the mill in the beginning of 2019, which will bring a further 50% reduction in nitrogen oxides and total particle solids, and 30% reduction for sulfur dioxide.

The first pilot of water recycling at the effluent plant was carried out; the results of the pilot were good but not all criteria were fulfilled. The second pilot is ongoing, with a target to recycle 5,000m<sup>3</sup> of wastewater a day using Ultra filtration and Reverse Osmosis.

In addition, some other water and energy reduction projects are already under construction. In particular, the construction of PM3 white water recirculation workshop project has already started and will be completed in June 2019. The PM1 vacuum system modification project is on-going and will contribute 1% total mill energy reduction after its completion in May 2019.

## Awards and recognitions

In addition to the provincial level awards for energy reduction and smart factory of PM1, the mill was also recognized as an Environmental Frontrunner by Changshu Economic & Technological Development Zone. Annual environmental dialog was held with the nearby villages' representatives, and all feedback was positive.

## Environmental Monitoring

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

A. Bi-monthly test of Yangtze River water quality nearby the mill by Changshu Water Resource Bureau

B. Measurement of mill waste water

- pH, COD, TSS, BOD<sub>5</sub>, P, N, NH<sub>4</sub>-N (Daily by mill laboratory)
- flow, pH, COD, NH<sub>4</sub>-N, TN and TP (24h-7d/w non-stop by on-line meters)
- pH, COD, TSS, BOD<sub>5</sub>, P, N, NH<sub>4</sub>-N, AOX, and colour (Monthly by third party)
- All above data are quarterly tested by the authority
- Mill area rainwater is tested by third party quarterly

C. Air emission (mill boiler stack)

- SO<sub>2</sub>, NOx, particulates and CO (24h-7d/w non-stop measurement)
- SO<sub>2</sub>, NOx, and particulates (Quarterly sample tested by third-party and randomly by authority)

D. Quarterly test was done for mill border noise by a third party

E. Monthly site inspections are done by the local authority



王志强

Mr. Steven Wang  
Mill EHS Director



Jukka Saarelainen

Mr. Jukka Saarelainen  
Mill General Manager

# Responsibility figures 2018

## Waste



99.6%

of mill solid wastes are reused or recycled with heat recovery.  
30% of total solid waste was reduced comparing with previous year 2017, mainly due to use of less ash-content coal and boiler modification shut-downs.

## Energy



Specific energy consumption per tonne of paper was reduced by

2.9%

in 2018, the reduction was mainly achieved thanks to the energy saving project covering our three paper machines.

## Certified Fibre



82%

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

## Air



Mill air emission reduced

37% for SO<sub>2</sub>

and

30% for NO<sub>x</sub>

respectively in 2018 comparing to last year. There was also a 40% reduction of particulates and 8% cut of CO<sub>2</sub> emission from coal-fueled boiler flue-gas.

## Water



Total wastewater flow was reduced by

6%

in 2018 compared to 2017.

## Employment



1,267 personnel

directly employed by UPM Changshu mill. In addition, there were 387 full-time service people from contractors and 31 interns working at the UPM Changshu mill site.

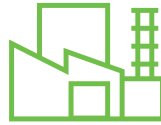
## Supply chain



**99.6%** of raw material

spend qualified against UPM Supplier and Third Party Code.

## Community



**103** UPM volunteers

provided environmental, safety and health information to

**880** students.

And our social welfare activities covered

**2,000** local citizens in 2018.

## Health



Annual health check covered

**100%** of mill employees

and zero occupational illnesses were reported in 2018.

## Safety



**38%** decrease of TRI\* rate

was achieved comparing to 2017.

And

- 98% of safety incident handled within 6 weeks from initial reporting.
- 94% actions closed where proactive actions were required as a result of all incidents, safety walks etc. carried out in 2018.

\*TRI: Total Recordable Injures

## Taxes



Annual contributions to China government was

**42** 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)

# Air



UPM Changshu 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 its in-house capacity, external electricity and steam are occasionally purchased to cover any shortages. The gas boilers are only used for producing steam during the overhaul of the coal-fueled boilers.

The coal-fueled boiler's flue-gas is purified through denitrification, desulphurization and particulate removal processes. The rebuild of the flue-gas purification system started in October 2017 and was successfully completed in November 2018. The test run of the new system has clearly showed that the

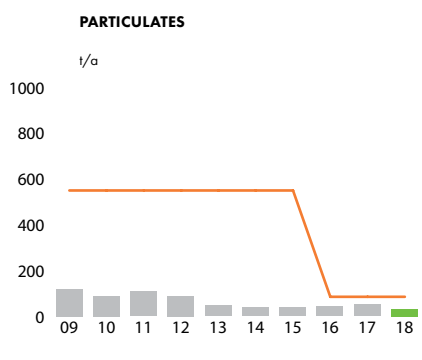
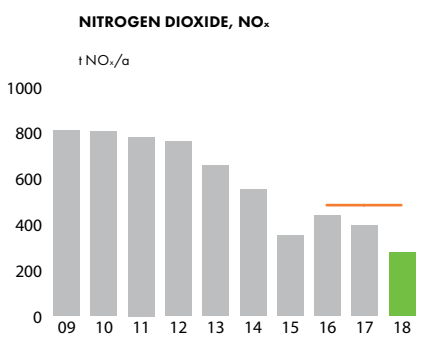
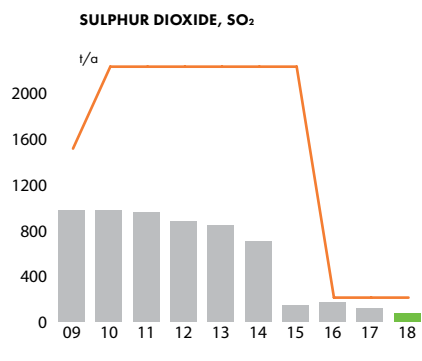
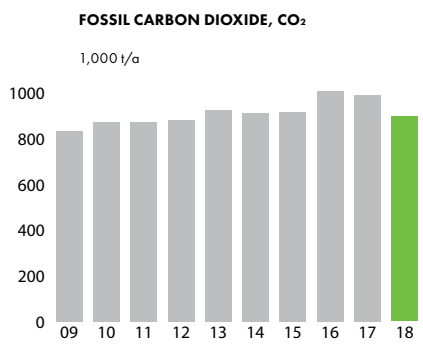
boiler can reach super-low emission levels, the strictest permitted level in China.

In China, local and national authorities limit air pollutant emissions for industrial enterprises by the total volume and unit concentration, as specified in the table below. The Changshu mill's air pollutants emission quota was cut significantly in late 2016; the emission quota were based on the mill existing boilers' capacity and authority permit limits of pollutant concentration.

## MILL AIR POLLUTANT EMISSION PERMITS 2018

Item	Quantity (t/a)	Concentration* (mg/nm <sup>3</sup> )
Sulphur dioxide, SO <sub>2</sub>	221.88	50
Particulates	90.16	20
Nitrogen oxides, NO <sub>x</sub>	456.37	100

\*Hourly limit values specified by national standard GB13223-2011 for thermal power plant emissions



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: NO<sub>x</sub> are monitored by measuring NO and calculated into NO<sub>2</sub>

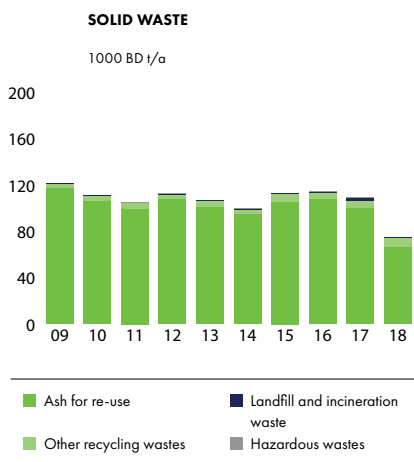
— Permit limit

# Waste



Solid wastes from the mill are mainly derived from boiler ashes, waste packaging, maintenance wastes and a small amount of non-recyclable waste. Waste is 99.6% recycled or reused. Non-recyclable waste is disposed by incineration or landfilling. The landfill field is located 30km west of the mill. The site is rented and operated by a private company with legal license. The combustible non-hazardous waste from the mill is incinerated in an external power plant with heat recovery. A small amount of hazardous waste is treated by qualified environmental companies in compliance with relevant laws and regulations. Effluent sludge is incinerated in mill boilers as biofuel so it is excluded from waste statistics.

Mill total waste generation had a reduction of 30% comparing to the amount in the year 2017. The reduced part of the waste is mainly the boiler ashes due to use of low ash content coal and boiler modification shutdowns.



Remark 3: The weights included in the figures are dry weights.

# Water

The mill's wastewater treatment plant (WWTP) designed capacity is 26,400 m<sup>3</sup>/d. The processes mainly consist of pre-sedimentation, bio-activated sludge stage, anoxic denitrification and finally the disc filtration process. The performance of the WWTP has been excellent over the year.

The wastewater treatment plant continues to maintain excellent operation throughout the year, and the most of wastewater pollutant indicators were significantly lower than the emission permit values in 2018. However preventive measures, such as wastewater accident drills, were also implemented to respond to sudden, but unlikely wastewater deviations. The newly built rainwater and fire water collection system adds another measure to ensure the safety of wastewater in the mill area. Tests regarding water reduction at the paper machines and the reuse of purified wastewater were continued; a conclusive summary is expected by the end of 2019.

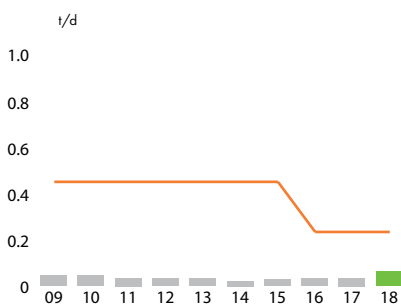
Limits for both the quantity and the concentration of the water pollutants for industrial enterprises are set by local or national Chinese authorities (quantity: local permit; concentration: by table 3 in "Discharge Standard of Water Pollutants for Pulp & Paper Industry", standard code GB3544-2008. The table below shows the strictest limit in

China. Total nitrogen, ammonia nitrogen and total phosphorus emission quota have been reviewed in 2018 based on the mill production capacity and permitted limits of pollutant concentrations.

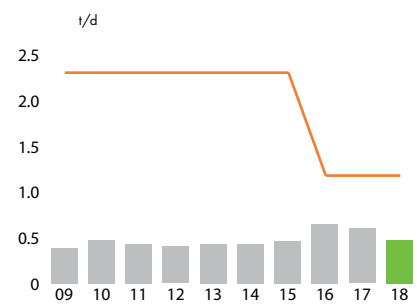
MILL WATER POLLUTANT DISCHARGE PERMITS 2018		
Item	Quantity (t/a)	Concentration* (mg/l)
Chemical oxygen demand, COD <sub>Cr</sub>	417.56	50
Total suspended solid, TSS	83.52	10
Ammonia nitrogen, NH <sub>4</sub> -N	27.32	5
Total nitrogen, TN	54.63	10
Total phosphorus, TP	2.732	0.5

\*hourly average values

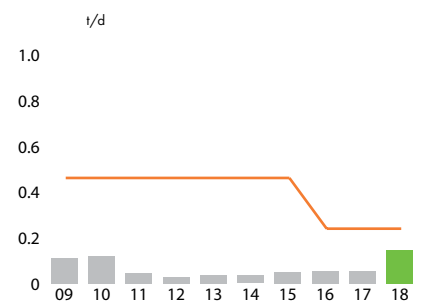
**BIOLOGICAL OXYGEN DEMAND, BOD<sub>5</sub>**



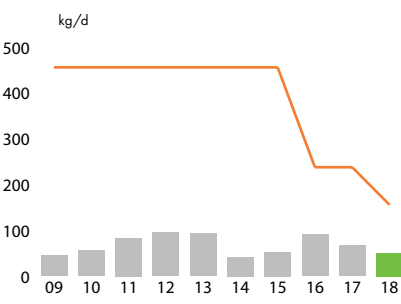
**CHEMICAL OXYGEN DEMAND, COD<sub>Cr</sub>**



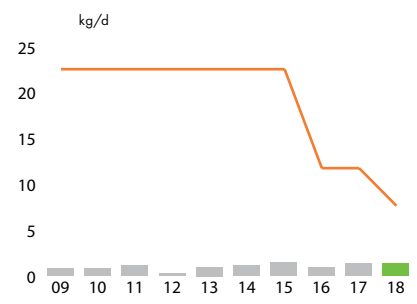
**TOTAL SUSPENDED SOLIDS, TSS**



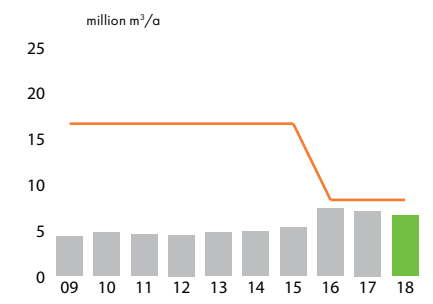
**TOTAL NITROGEN, TN**



**TOTAL PHOSPHORUS, TP**



**EFFLUENT VOLUME**



Remark 1: Above measurements are done according to Chinese standards which are derived from ISO standards, but they might not be fully comparable.

— Permit limit

# Societal Responsibility

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

In 2018, UPM Group launched its new brand promise "UPM Biofore – Beyond fossils", guided by the brand promise, we are going to utilize the limitless opportunities of the bio-economy to promote the development of circular economy and create value to our stakeholders.

The year 2018 also marked 20 years since UPM's first investment in China. During the first China International Import Expo (CIIE), UPM celebrated its 20th anniversary at the Finnish national booth. Government officials from both China and Finland, as well as partners and clients of UPM, witnessed this vital and exciting moment. UPM also showcased its Biofore concept car at CIIE. The car symbolizes our "Beyond fossils" brand promise by integrating sustainability and innovation, exploiting renewable bio-materials and bio-diesel.

## 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. 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. In 2018, Changshu mill has achieved a 38% reduction of Total Recordable Injuries. The mill was awarded the Safety Frontrunner recognition by Changshu Economic & Technical Development Zone.

In 2019, Changshu mill will focus on updating its safety instructions to create a standard approach to safety and to encourage all employee to proactively report safety ob-

servations and help others to correct unsafe behaviour. The objective is to build an interdependent safety culture on the long term.

In response to the safety requirements of UPM Group and in line with the national initiative of "Safety Production Month" in June, Changshu Mill regularly holds "Week of Safety and Health" activities each year, reviewing safety performance and positive development, organizing various activities, and encouraging every employee to participate, in order to learn from each other, share practice and better strengthen safety and health awareness, while continuously improving safety performance in all working areas of the mill.

In 2018, UPM was awarded as the "Top Employer in China" for the seventh time, and continue to be awarded the "Best Practices for Healthy Employers in China". This is a recognition of UPM's long-term commitment to developing a safe 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, 42% of employees in China have worked for UPM for more than 10 years, while more than 15% of employees in China have been with the company for more than 20 year.

To celebrate UPM's 20 years in China, a series of activities have also been organized for employees and their families who have been with UPM for 20 years.

In order to enrich employees' spare time, clubs of staff committee have organized team building activities or public welfare activities to continuously improve the physical and mental health of employees and enable them to enjoy a high-quality life.

## Contribution to local society

Building and maintaining good relations with



UPM IN CHINA 20 YEARS



## SUPPLIER MANAGEMENT INFORMATION

Total number of contracted suppliers	145
Direct raw material suppliers	45
Other material and service suppliers	88
Transportation service providers	12
Number of suppliers been audited on-site in 2018	18
Number of suppliers to be audited in 2019	17





**Pupils in UPM Green Future summer camp**

local communities close to our operations are essential for ensuring our business success. Our environmental volunteer teams co-operate with the local government as well as local communities and schools in an effort to improve people's environmental awareness.

The "Green Future" project is a partnership between the Changshu Environmental Bureau, Changshu Education Bureau and UPM to support interactive education programs. "Green Future" aims to provide environmental education in order to evoke students' sense of shared responsibility from an early age, include habits that advance energy saving and environment protection. Since the program was established in 2010, more than 255 UPM volunteers have been working with 59 local schools in Changshu city, Shanghai and Jiangxi province. The program has been effective and well received by students, teachers and parents. The program has also been recognized by the Changshu government and local media.

"Green lifestyle" information sharing has been another volunteer campaign organized by UPM and Changshu Environment Bureau for several years. Activities have been held in many local communities to encourage people to take action in order to protect the environment. During the past six years' time, more than 4,000 local citizens in different communities in Changshu city have received our training and support.

Under the guidance of UPM Group's "Biofore Share and Care" program, in 2018, UPM China formally joined the "Green

Bookshelf" environmental education program by donating books of environmental science, environmental education and ecological protection to schools. This program will help strengthen basic environmental education, promote the concept of ecological civilization, cultivate students' environmental awareness and contribute to the "Reading Green, Green Reading" initiative.

Other departments and clubs also organized volunteer activities for social activities that promote public good, such as UPM share and care "Reading" activity and caring activity for autistic children. Both programs aim to contribute to the environmental protection and social welfare in Changshu.

### **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 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 supplier to adhere to the "UPM Supplier Code and Third Party Code" 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.

At UPM's 2018 supplier day, UPM actively

shared its continuous development work of improving efficiency, transparency and responsibility. UPM firmly believes that a long-term responsible partnership with suppliers is critical to ensure responsible sourcing throughout the entire supply chain.

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 limitless opportunities of the bioeconomy, UPM is delivering renewable and responsible solutions, and innovating for a future beyond fossils.

# Environmental Parameters 2018

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.

<b>Production capacity</b>	Wood-free and specialty paper	1,400,000 t
<b>Raw materials and additives</b>	Pulp Fillers and coating pigments Chemicals for paper production Others	See UPM Corporate Environmental Statement for more information
<b>Energy</b>	Fossil and biomass-based fuels Purchased power	Fossil 99%, biomass-based 1% See UPM Corporate Environmental Statement for more information
<b>Emissions to air</b>	Particulates Sulphur dioxide, as SO <sub>2</sub> Nitrogen oxide, as NO <sub>x</sub> Carbon dioxide, as CO <sub>2</sub> (fossil)	31 t 76 t 263 t 911,715 t
<b>Water intake</b>	Process and cooling water including power plant use Municipal water	10,583,540 m <sup>3</sup> 331,387 m <sup>3</sup>
<b>Discharges to water</b>	Clean cooling water Process effluent volume BOD <sub>5</sub> COD <sub>cr</sub> Solids Phosphorus, P Nitrogen, N	237,250 m <sup>3</sup> 6,653,232 m <sup>3</sup> 22.9 t 165 t 52 t 0.5 t 18 t
<b>Side-product</b>	Ammonia sulfate	3,138 t
<b>Waste to recycling, energy recovery *</b>	Boiler ash Sludge Wood waste Waste paper and board Metals Other recycling waste	66,202 t 1,128 t 255 t 3,876 t 2,389 t 929 t
<b>Waste to landfill *</b>	Construction wastes Production process wastes	303 t 20 t
<b>Hazardous waste</b>		105 t
<b>Size of mill area</b>		184.5 ha

\* Dry weights



# Performance against the targets in 2018

TARGET	ACHIEVEMENT	COMMENTS
<b>1 Clean Run deviations</b> – Category 5 = 0 – Category 4 = 0 – Category 3 = 0	Yes Yes Yes	Actual results 0 0 0
<b>2 Clean Run observations ≥ 120 reports /year</b> – Encourage employees to report Clean Run observations	Yes	162 observations reported, including reports by staff from global function
<b>3 Coal-fueled boilers' super-clean</b> – emission modification project implemented timely	Yes	Finished one month earlier than scheduled
<b>4 Mill-wide energy and water saving versus 2017 results</b> – Electricity reduction 0.5% per unit product – Steam reduction by 0.5% per unit product – Water usage reduction 0.3m <sup>3</sup> per tonne product	Yes Yes Yes	Energy reduction target exceeded thanks to Energy Saving project. Water reduction target of 0.5m <sup>3</sup> per ton of paper achieved thanks to improvements at PM3.

## Targets for 2019

TARGET	DEPARTMENT RESPONSIBLE
<b>1 Clean Run deviations</b> – Category 5 = 0 – Category 4 = 0 – Category 3 = 0 <b>Clean Run observation report ≥ 150</b>	All personnel
<b>2 Occupational, health and safety</b> – Number of lost time accident (LTA) = 0 case	All personnel
<b>3 Solid waste management</b> – Landfill waste cut 20%	Environmental manager and all personnel
<b>4 In-house jetty floor washing water collection project implementation plan ready</b>	Mill logistics manager and environment manager
<b>5 Achievements in reducing mill-wide energy and water consumption (compared to 2018)</b> – Electricity consumption reduced by 1% per unit product – Steam reduction by 0.5% per unit product – Water consumption reduction by 2% per unit product	Production managers



### VALIDATION STATEMENT

As accredited environmental verifier (FI-V-0001), Inspecta Sertifiointi Oy has examined the environmental management system and the information of UPM Changshu mill Environmental and Societal Responsibility 2018 report and of UPM Corporate Environmental and Societal Responsibility Statement 2018.

On the basis of this examination, the environmental verifier has herewith confirmed on 2019-05-08 that the environmental management system, this UPM Changshu mill Environmental and Societal Responsibility report and the information concerning UPM Changshu mill of UPM Corporate Environmental and Societal Responsibility Statement are in compliance with the requirements of the EMAS Regulation (EC) No 1221/2009.

We reduce the world's reliance on fossil-based materials by developing renewable and responsible products and solutions in all our businesses. **UPM Biofore – Beyond fossils.**



[www.upm.com](http://www.upm.com)

**UPM (China) Co., Ltd.**

No. 2 Xingye Road, Changshu  
Economic and Technological  
Development Zone, Jiangsu Province,  
China 215536  
Tel. +86 512 5265 1818  
Fax +86 512 5265 2300

**For further information, please  
contact:**

Jin Lisheng  
Environment Manager  
Tel. +86 512 5229 5997  
[Jin.lisheng@upm.com](mailto:Jin.lisheng@upm.com)

Wang Jue  
Senior Environmental Specialist  
Tel. +86 21 6448 5205  
[jue.wang@upm.com](mailto:jue.wang@upm.com)