



The Biofore Company **UPM**

ENVIRONMENTAL AND SOCIAL RESPONSIBILITY performance in 2016



UPM Changshu



Through the renewing of the bio and forest industries, UPM is building a sustainable future across six business areas: UPM Biorefining, UPM Energy, UPM Raflatac, UPM Specialty Papers, UPM Paper ENA and UPM Plywood. Our products are made of renewable raw materials and are recyclable. We serve our customers worldwide. The group employs around 19,300 people and its annual sales are approximately EUR 10 billion. UPM shares are listed on NASDAQ OMX Helsinki. UPM - The Biofore Company - www.upm.com

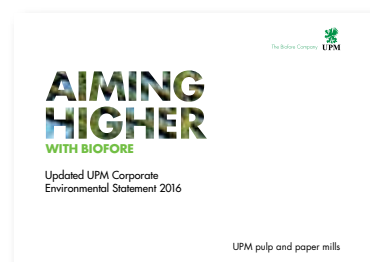
UPM Changshu

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, calcium carbonate is used as a filler of paper and kaolin is applied for coated paper as a pigment.

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 Social Responsibility Performance in 2016 is a supplement to the Corporate Environmental Statement of UPM's pulp and paper mills (available at www.upm.com) and provides mill-specific environmental performance data and trends for the year 2016. The annually updated mill supplements and the UPM Corporate Environmental Statement together form the joint EMAS Statement of UPM Corporation. The next updated Corporate Environmental Statement and also this supplement will be published in 2018.

Production capacity	1,400,000 tonnes		
Personnel	945 excluding global function staffs		
Products	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
Certificates	EMAS – EU Eco-Management and Audit Scheme ISO 14001 – Environmental Management System Standard ISO 9001 – Quality Management System Standard OHSAS 18001 – Occupational Health and Safety System Standard PEFC™ Chain of Custody – Programme for the Endorsement of Forest Certification FSC® Chain of Custody – Forest Stewardship Council Certificate for Measurement Assurance of Jiangsu Province <i>All certificates can be found from UPM's Certificate Finder (available at www.upm.com/responsibility)</i> <i>>Principles and Performance > Certificate finder</i>		
Environmental labels	China Green Label for copy paper		



The mark of responsible forestry
For FSC products, visit www.fsc.org



For PEFC products, visit www.pefc.org



Cert. No.: 05508P1054001R1M

Environmental year 2016

2016 was the first year the mill started full-year run with three paper machines in parallel successfully, and the production volume broke the historical record.

Focuses in 2016

During the whole year the mill has put great efforts in identifying and controlling the environmental risks that might be brought about by the newly-started paper machine (PM3). As a result of this risk assessment, the operating instructions for waste water handling were updated to cope with the increased complexity of the water treatment process for the whole mill.

Results in 2016

After a few months' trial run, the new paper machine (PM3) project successfully passed the official environmental impact test and its operation was approved by authority in late summer of 2016. Meanwhile, the mill's annual Clean Run targets were also fulfilled by the year-end.

Another clear achievement of the year was the excellent control on the air emission of the mill's coal-fueled boilers where all pollutants concentration and the amount of emissions were kept far below the permit limits. Mill waste water treatment plant (WWTP) has been running smoothly over the year, with all pollutant indicators maintained in a satisfactory level on monthly average. Unfortunately, however, two deviations were identified on February 18th and August 31st respectively, when the chemical oxygen demand (COD) concentration in the purified waste water slightly exceeded the permitted level.

Most of the mill's environmental param-

eters were within the optimum ranges indicated in the Best Available Techniques (EU BAT BREF 2014). Despite the good results, however, new efforts are being planned for the further reduction of water and energy usage. An ambitious program is already on the way as the "Clean and Resource Efficient Paper-making" project was launched in late 2016.

No environmental complaint was received in 2016 from any related parties.

Environmental Monitoring

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

- A. Bi-monthly test Yangtze River water quality nearby the mill by Changshu Water Resource Bureau
- B. Measurement of mill waste water
 - pH, COD, TSS, BOD₅, P, N, NH₄-N

- (Daily by mill laboratory)
 - flow, pH, COD and NH₄-N (24h-7d/w non-stop by on-line meters)
 - pH, COD, TSS, BOD₅, P, N, NH₄-N, AOX, and colour (Monthly by third party)
 - All above data are quarterly tested by the authority
 - Mill area rainwater is sample-tested by third party in dry and rainy seasons
- C. Air (mill boiler stack)
 - SO₂, NOx, particulates and CO (24h-7d/w non-stop measurement)
 - SO₂, NOx, and particulates (Quarterly sample-tested 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

Pentti Putkinen

Mr. Pentti Putkinen
Mill General Manager

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 56 t/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 the shortage. 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. This flue-gas treatment system has been running excellent

in 2016, without any air emission deviations over the year.

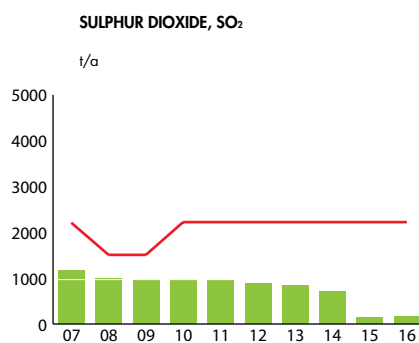
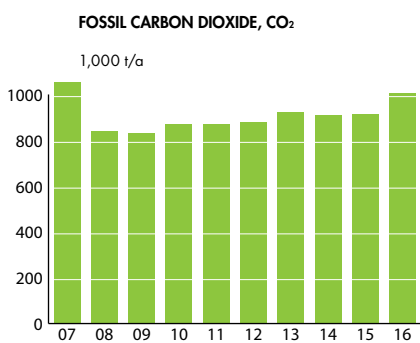
After the PCC plant was built in 2015, part of the purified flue gas (CO₂) is used to produce precipitated calcium carbonate (PCC), the main filler for fine paper production. This is a good example where a waste stream can be utilized to make useful product and reduce carbon emission.

Air pollutants emissions for an industrial enterprise are limited both by the total volume and unit concentration specified in the tables below by the local and national authorities.

Air Pollutant Emission Permits 2016

Items	Quantity (t/a)	Concentration* (mg/nm ³)
Sulphur dioxide, SO ₂	2,238	50
Particulates	554	20
Nitrogen oxides, NO _x	Not defined	100

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

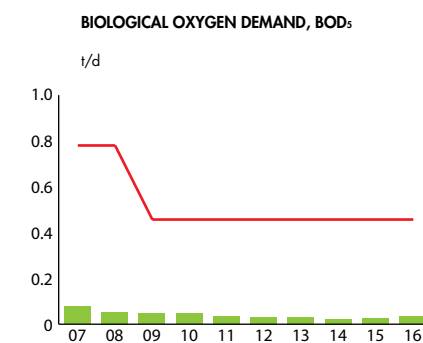
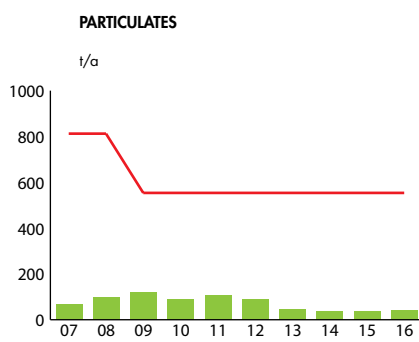
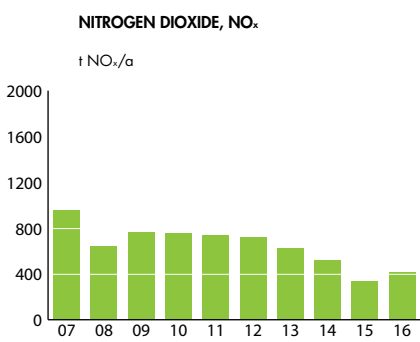


Water

The mill waste water treatment plant (WWTP) designed capacity is 26,400m³/d. The processes mainly consist of pre-sedimentation, bio-activated sludge stage, anoxic denitrification and finally disc filtering process.

Despite the increased complexity in the treatment process due to the newly-started machine (PM3), the WWTP has been performing well most of the time of the year. Two deviations, however, were observed, in which the COD concentration was slightly over the permitted limit for a short period. The followings are the details of the deviations.

A latex leakage happened on February 18th when a bottom valve of the receiving tank of a truck unloading the latex was opened by mistake. The leaked latex flew soon into WWTP, imposing an extra COD load and causing the COD concentration to exceed the permit limit (50mg/l) slightly for



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_x are monitored by measuring NO and calculated into NO₂

— Permit limit

Waste

Mill solid wastes are mainly boiler ashes, waste packaging, maintenance wastes and a small amount of non-recyclable waste. Wastes are 99% recycled or reused. Non-recyclable waste is disposed by landfill in a site located 30 km west of the mill. The site is rented and operated by a private company with legal license. The burnable non-hazardous waste from the mill is incinerated in an external power plant. There was also a small amount of hazardous wastes which were treated by qualified environmental companies in compliance with the relevant laws and regulations.

Effluent sludge is incinerated in mill boilers as biofuel so it is excluded from waste statistics.

A set of mill solid waste instructions and the collection facilities were updated and implemented in 2016.

five hours. In late August, abnormal foaming phenomenon was observed at the aeration basin of WWTP. The foaming developed further on August 31st and finally resulted in an above-limit COD concentration for a couple of days.

The root causes for above mentioned deviations were analyzed, and the corrective actions have been in place. At the same time, more actions are being taken to study the foaming mechanism, with an effort to eliminate, on the long term, the abnormal foaming to the WWTP.

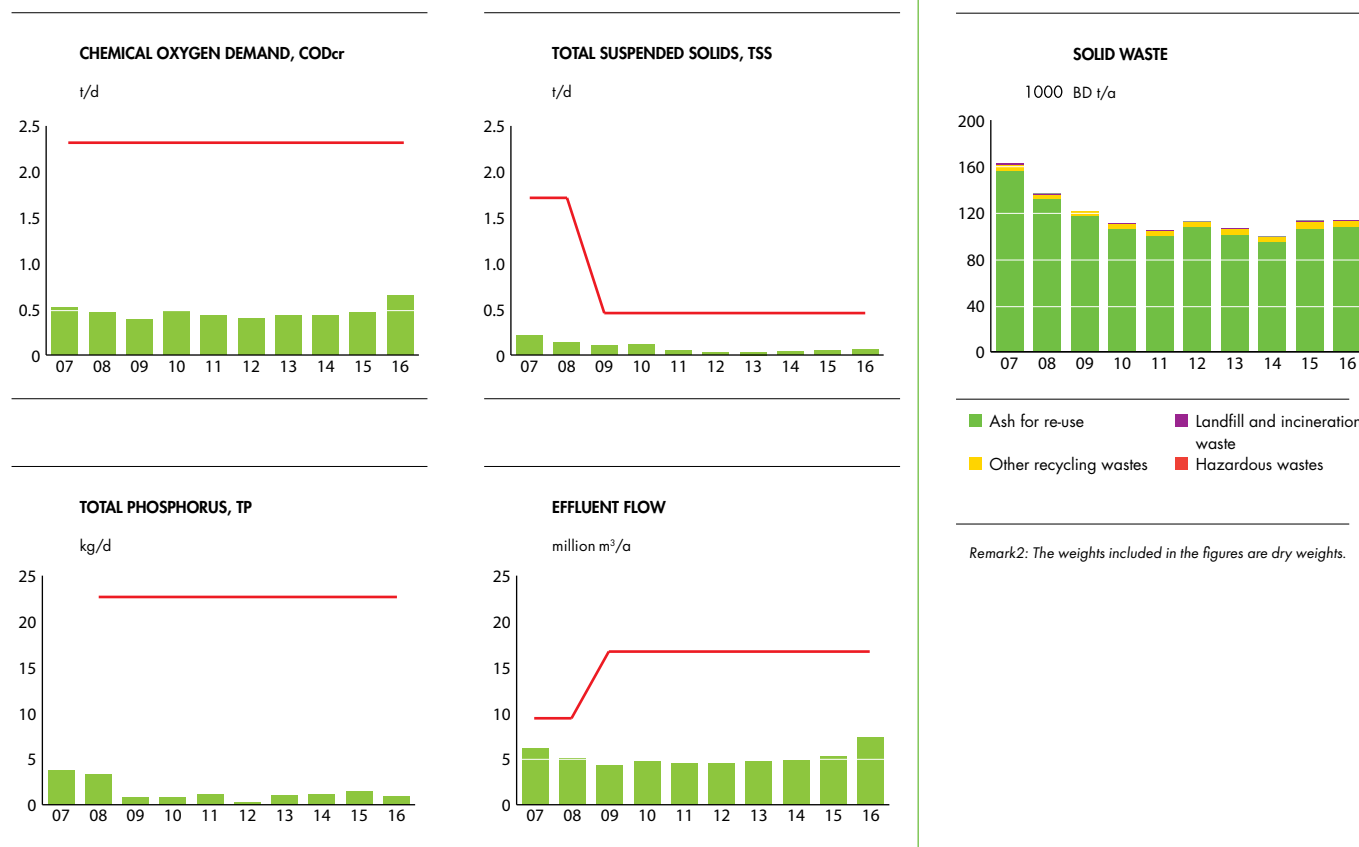
In 2016, the total discharged effluent flow and COD were increased due to more production from the new machine line PM3.

The limits of both the quantity and the concentration of the water pollutants of an industrial enterprise is mandatorily set by the local or national authorities (quantity: by local permit; concentration: by table 3 in "Discharge Standard of Water Pollutants for Pulp & Paper Industry", standard code GB3544-2008. Table 3 is in China the strictest limit currently.

Water Pollutant Discharge Permits 2016

Items	Quantity (t/a)	Concentration* (mg/l)
Chemical oxygen demand, COD _{Cr}	834.0	50
Total suspended solid, TSS	166.7	10
Ammonia nitrogen, NH ₄ -N	83.3	5
Total nitrogen, TN	Not defined	10
Total phosphorus, TP	8.3	0.5

*hourly average values



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: The weights included in the figures are dry weights.

— Permit limit

Environmental Parameters 2016

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.

Production capacity	Woodfree Fine and Specialty Papers	1,400,000 t
Raw materials and additives	Pulp Fillers and coating pigments Chemicals for paper production Others	See UPM Corporate Environmental Statement for more information
Energy	Fossil and biogenic fuels Purchased power	Fossil 99%, biogenic 1% See UPM Corporate Environmental Statement for more information
Emissions to air	Particulates Sulphur dioxide, as SO ₂ Nitrogen oxide, as NO _x Carbon dioxide, as CO ₂ (fossil)*	43 t 169 t 415 t 1,008,000 t
Water intake	Process and cooling water including power plant use Municipal water	11,274,000 m ³ 274,000 m ³
Discharges to water	Clean cooling water Process effluent volume BOD ₅ COD _{cr} Solids Phosphorus, P Nitrogen, N	237,000 m ³ 7,339,000 m ³ 12 t 238 t 20 t 0.4 t 33 t
Waste to landfill**	Construction and production wastes	480 t
Waste for incineration	Domestic waste	310 t
Waste to recycle**	Boiler ash Wood waste Waste paper and board Metal Other recycling waste	107,475 t 397 t 3,088 t 2,149 t 170 t
Hazardous waste		113 t
Size of mill area		184.5 ha

* CO₂ consumed for PCC production was not deducted from this figure

** Dry weights



Waste water treatment plant operators are taking water samples

Performance against the targets in 2016

TARGET	ACHIEVEMENT	COMMENTS
1) Clean Run deviations Category 5 = 0 Category 4 = 0 Category 3 ≤ 2	Yes Yes Yes	Actual results 0 0 2
2) Clean Run observations - Encourage employees to report Clean Run observations (≥ 60 reports/year)	Yes	- 95 observations reported
3) PM3 operation optimization - Following the start-up curve and reaching the water and energy consumption targets	Yes	- PM3 operation efficiency and consumptions have been improving as expected
4) Mill waste handling - Fully implement the new waste handling instructions and improve waste collection facilities	Yes	- Waste handling instructions were updated and communicated; waste facilities were renewed
5) Mill-wide energy and water saving versus 2015 results - Electricity reduction 0.5% per unit product - Steam reduction by 0.5% per unit product - Water usage reduction 0.2m ³ per unit product	No Yes No	- Electricity saving target not reached due to PM1 and PM2 lower runnability - 2% steam saving realized - Water usage maintained flat as 2015

Year 2017 targets

TARGET	DEPARTMENT RESPONSIBLE
1) Clean Run deviations Category 5 = 0 Category 4 = 0 Category 3 ≤ 1	All
2) Clean Run observations ≥ 100 reports/year - Encourage employees to report Clean Run observations	All
3) Waste water - Foaming mechanism study and long-term solution proposal	Project manager
4) Mill-wide energy and water saving versus 2016 results - Electricity reduction 1% per unit product - Steam reduction by 0.5% per unit product - Water usage reduction 0.2m ³ per unit product	Paper production managers



REVALIDATION STATEMENT

As an accredited environmental verifier (FHV-0001), Inspecta Sertifiointi Oy has examined the environmental management system and updated UPM Changshu Environmental and Social Responsibility Performance 2016 report as well as the information concerning UPM Changshu in the Updated UPM Corporate Environmental Statement 2016. On the basis of this examination, the environmental verifier has herewith confirmed on 2017-04-07 that the environmental management system, the updated UPM Changshu Environmental Performance report and the information concerning UPM Changshu in the Updated UPM Corporate Environmental Statement are in compliance with the requirements of the EMAS Regulation (EC) No 1221/2009.

UPM Changshu Social Responsibility

UPM takes into account economic, social and environmental responsibility in its daily operations, and aims to be the leader of sustainable development. UPM Changshu Paper Mill attaches great importance to social responsibility.

In 2016, UPM Code of Conduct has been revised to respond to the ever faster evolving business environment and regulatory framework. Ethical practices, legal compliance and work safety are foundation of all UPM businesses. The Chinese version of UPM Code of Conduct - "Every Choice Matters" has been delivered to every employee; discussions and trainings are organized to make sure that everyone make the right choices in our everyday work.

Occupational health and safety

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

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 the past few years, Changshu mill has achieved excellent safety performance, and has been awarded with the "Safety Management Leading Mill" title by UPM Group. The monthly "Safety Talk" is a new way of communication, to encourage all employees to communicate and discuss safety issues based on monthly theme and daily practice.

In 2016, UPM was certified as the "China's Outstanding Employer" for the fifth year, and was awarded the top ten "Best Practices for Healthy Employers in China". This is a recognition of UPM's long-term commitment on developing a safe and inspiring working environment in which people can participate and grow as professionals.

UPM focuses on long-term career development, emphasizing on performance and

employee engagement. The smooth two-way communication stimulates staff professionalism, 35% of employees in China work for UPM for more than 10 years.

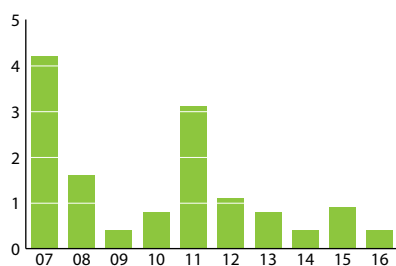
Contribution to local society

Our environmental volunteer teams co-operate with local government, energize local communities and schools improving people's environmental awareness.

"Green Future" project is a new model of school-company interactive education program. Co-hosted by Changshu Environment Bureau, Changshu Education Bureau and UPM, Green Future is aiming to further deepen environmental education, to activate students' sense of responsibility, so that they can wake environmental awareness from an early age, and develop good habits of energy saving and environment protection. It has been 7 years since its startup in 2010 and more than 120 UPM volunteers have been working in 42 local schools. They are warmly welcomed by students,

LOST TIME ACCIDENT (LTA) FREQUENCY

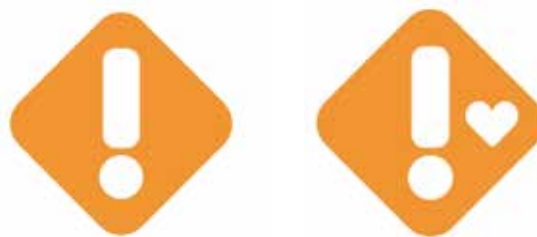
number of LTA/million working hour



Remark: figures including sub-contractors worked for UPM paper production but excluding other on-site and off-site service contractors

UPM SAFETY PRINCIPLE

Safety first!
Safety starts with me.
We can prevent all accidents.



UPM safety and health logo

teachers and parents and good effect has been achieved. Changshu government and media has given high attention to the project.

“Green lifestyle” info-sharing has been another volunteer campaign organized by UPM and Changshu Environment Bureau for years. Activities have been held in many local communities to evoke people to protect the environment. In four years’ time, more than 200 local citizens have received our training and supports.

Besides, other departments and clubs also organized their volunteers to help old people in nursing homes, to clean the Yushan Mountain, and to plant trees.

Promote sustainable economic development

UPM’s compliance with laws and regulations – in particular, competition and anti-corruption laws – founds a solid ground as a trustworthy business partner, and our responsible and ethical practices create

long-term value for both UPM and its stakeholders.

At the end of 2016, UPM Changshu Mill had 1177 employees (global function departments included), 15 trainees, and 158 on-site contractor employees, including IT service, security, catering, cleaning personnels which work 8 hours per day.

In 2016, UPM Supplier and Third Party Code has been renewed. The structure of the new Code follows the structure of UPM Code of Conduct.

Supplier audit is part of responsible sourcing, aiming to audit their performance in environment, occupational health and safety, as well as corporate social responsibility.

UPM promotes responsible practices throughout the value chain and is active in finding sustainable solutions in co-operation with its customers, suppliers and partners. Creating value for society both as a company and through our products is an essential part of the Biofore Strategy.

Supplier management information

Total number of contracted suppliers	185
Direct raw material suppliers	46
Indirect raw material suppliers	134
Transportation service providers	5
Number of suppliers been audited in 2016	18
Number of suppliers to be audited in 2017	15



Students in Green Future activity

UPM Changshu 2016 Social Responsibility Milestone

JANUARY

UPM Changshu Mill trade union info-sharing meeting and club member enrollment

In order to enrich people's life, continuously improve employees' physical and mental health and to enjoy life of high quality, the six clubs, established by trade unions, organized exciting activities all the year round.

01

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06

FEBRUARY

Mill Employee Engagement Survey

MARCH

On March 22, 2016, the "The Fifth My Heaven My Water UPM Cup Article Competition" was officially launched.

This is the first cooperation project between UPM and Suzhou Water Resources Bureau to promote water culture and strengthen water education for social welfare purposes, during which 3,850 articles were collected from local schools. By supporting such competition in Suzhou, UPM wants to further establish a good company image on water protection and water efficiency. Meanwhile, UPM hopes to call on all primary, middle and high school students as well as general public to cherish water resources, and get into a habit to save water.

MAY

Green Future Project activities

Knowledge about environmental protection, water and energy saving, waste sorting, forest and ecosystem, etc were shared with students.

APRIL

"Green lifestyle" volunteer info-sharing on the "Earth Day"

In the Earth Day on April, UPM volunteers shared environmental protection, first aid and well-being knowledge in Bao Bei community.

JUNE

Safe and Healthy Week activities

In June, in order to tally with the theme of 15th national safety production month "Strengthen safety development, enhance people's safety", UPM Changshu mill organized the "Safe and Healthy Week". Events with special themes were organized every day, full participation were encouraged to further improve safety awareness.

"Protect blooming flower" UPM Volunteer activity

JULY

"Green Future"
summer camp



SEPTEMBER

UPM "Ulympic" - UPM 5th Staff Games.

In September, UPM Changshu Mill organized "Ulympic" - UPM 5th Staff Games. UPM advocates healthy life, improve team cohesion, so that our staff could commit into work and life more energetic.

NOVEMBER

UPM Fire-fighting Olympics

In November, the 16th Fire-fighting Olympic was held to make fire-fighting knowledges and improve employees' safety awareness. In addition, fire-fighting knowledge seminars and first aid trainings were organized.

Supply Chain nursing house volunteer activity

07

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AUGUST

UPM Code of Conduct training

OCTOBER

UPM awarded the top ten "Best Practices for Healthy Employers in China"

DECEMBER

UPM was certified as the "China's Outstanding Employer" for the fifth year



MORE WITH BIOFORE

UPM leads the integration of bio and forest industries into a sustainable future. Biofore stands for innovation, responsibility and efficiency.
www.upm.com



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