The Biofore Company UPM

ENVIRONMENTAL
performance in 2014

UPM Jämsä River Mills

UPM in the Jämsä River Valley

UPM's Jämsä River Mills, Jämsänkoski and Kaipola, are located in the Jämsä River Valley in Central Finland. The Jämsänkoski Mill is on the banks of the Jämsä River, and the Kaipola Mill is on the edge of Lake Päijänne. Since the mills are located in the immediate vicinity of residential areas and watercourses, special attention is paid to environmental aspects during all of their operations.

The units form a single entity, with the SC production unit in Jämsänkoski manufacturing uncoated magazine paper and the Label Papers production unit producing label paper for labels and packaging. The Kaipola unit manufactures coated magazine paper, directory paper and newsprint.

The main raw material for the magazine paper manufactured at Jämsänkoski is mechanical pulp made from spruce pulpwood. The main raw material for the label papers is chemical pulp from the company's partner mills. The main raw materials used at Kaipola are spruce sawmill chips, recovered paper from households and varying quantities of spruce pulpwood.

There are a total of seven paper machines at the Jämsä River Mills, four of them at Jämsänkoski and three at Kaipola. In November 2014, UPM announced plans of a permanent closure of PM 5, a paper machine manufacturing SC paper at Jämsänkoski mill.

Both of the mill sites include a debarking plant, a TMP plant, a water station and a biological effluent treatment plant. In addition to these, Kaipola also includes an de-inking plant for recovered paper from households. In both mill sites, the heat required for the process and a small portion of the electricity are produced by the mill's own power plant. In addition, heat is recovered from the TMP plants.

Production capacity	1,600,000 tonnes of paper		
Employees	983		
Products	**Magazine papers** SC production unit UPM Max UPM Cat UPM Smart UPM Impresse	**Newsprint and magazine papers** Kaipola production unit UPM News UPM Brite UPM Book UPM EcoLite UPM EcoPrime UPM Opalite UPM Cote UPM Ultra UPM Ultra silk UPM Valor	**Label papers** Label paper production unit UPM Label Papers UPM Packaging Papers
Certificates	EMAS – EU Eco-Management and Audit Scheme ISO 14001 – Environmental Management System Standard ISO 9001 – Quality Management System Standard PEFC™ Chain of Custody – Programme for the Endorsement of Forest Certification FSC® Chain of Custody – Forest Stewardship Council® *All certificates can be found from UPM's Certificate Finder (available at www.upm.com/responsibility)*		
Environmental labels	EU Ecolabel		

FSC www.fsc.org FSC® C014719
The mark of responsible forestry
For FSC products, visit www.fsc.org

PEFC PEFC/02-31-80 Promoting Sustainable Forest Management www.pefc.org
For PEFC products, visit www.pefc.org

EU Ecolabel www.ecolabel.eu FI/11/001

EU Ecolabel www.ecolabel.eu FI/37/001

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 Paper Asia, UPM Paper Europe and North America and UPM Plywood. Our products are made of renewable raw materials and are recyclable. We serve our customers worldwide. The group employs around 20,000 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

The water used by the Jämsänkoski Mill is taken from Koskikeskinen and Iso-Ryöni. The Kaipola Mill uses water piped from Arvajankoski. Both mills use the Vierelä landfill site for the intermediate storage of power plant ash.

The environmental impact of the mills, in terms of watercourses and fishery, is being monitored by Nab Labs Oy in Jyväskylä, Finland (formerly the Institute of Environmental Research at the University of Jyväskylä). There is also a monitoring programme, which is approved by the Centre for Economic Development, Transport and the Environment and is managed in co-operation with the Water Supply Company owned by town of Jämsä. Air quality is being monitored in co-operation with Jämsän Aluelämpö Oy and the town of Jämsä.

UPM Jämsä River Mills Environmental Performance in 2014 is a supplement to the Corporate Environmental of UPM's pulp and paper mills (available at www.upm.com) and provides mill-specific environmental performance data and trends for the year 2014. The annually updated mill supplements and the UPM Corporate Environmental Statement together form the joint EMAS Statement of UPM Corporation. The next Corporate Environmental Statement and also this supplement will be published in 2016.

Environmental year 2014

In 2014, the Jämsä River Mills continued to further develop their operations in a sustainable manner. Key goals were to both improve the cost-efficiency of production, and to further develop the culture of occupational safety. The environmental performance campaign Clean Run continued as part of production activities. The importance of detecting minor environmental deviations as part of daily work routines was particularly emphasised.

In terms of occupational health and safety, the Jämsä River Mills focused on proactive methods. A new risk assessment method was introduced over the course of the year, which systematically covers all the mill activities. To support the safe starting and completion of jobs, a procedure called 'Check for hazards' was introduced. This involves a checklist that employees use to verify all safety issues immediately before starting work. High-risk works have been identified and a written work permit procedure is in use.

The annual production volume of the mills was lower than in the previous year. The continual decrease in global demand for printing papers has resulted in variations in the utilisation of machine lines. The demand for label paper remained stable. The rebuild of paper machine PM 4 at Jämsänkoski mill in the autumn of 2014 has enabled a more extensive label paper product portfolio.

The mills operated within the limits of their environmental permits. Emissions from the power plants into the air remained within the permit limits. Continuous improvement of environmental performance proved a challenge due to the fact that the production lines were operated in a flexible manner. However, the mills succeeded in decreasing the water consumption compared to the previous year.

Disturbances quickly addressed

An overflow at an effluent pumping station at the Kaipola mill caused a short-term disturbance in January. Around 252 cubic metres of untreated effluent ended up in Lake Päijänne due to a malfunction in the surface level measuring system. The disturbance did not have any impact on the condition of the waterways.

There was a disturbance in the sludge treatment process at Kaipola mill in April. This resulted in the effluent from the mill, which contains solids, overloading the preliminary sedimentation system at the biological treatment plant. The preliminary sedimentation system was partially drained by pumping some effluent into an earth basin. The earth basin is a natural basin in which the effluent is filtered by several layers of soil before it reaches Lake Päijänne. The partial draining of the pre-sedimentation system was a highly exceptional action that was necessary in order to keep the biological treatment plant in operation. No untreated effluent was released directly into the waterway. A statutory permit was granted for the use of the earth basin under these exceptional circumstances. The cause of the disturbance was studied by means of a root cause analysis and the necessary corrective actions were implemented. The event was classified as a major environmental deviation in the Jämsä River Mills Clean Run procedure.

A malfunction at one of the secondary sedimentation basins at the Kaipola biological treatment plant caused some biosludge to release into treated effluent in June. The malfunction became apparent during maintenance. In the siphon system of a scraper that removes biosludge from secondary sedimentation had failed and some of the biosludge did not sedimentate. The scraper's siphon system was supported by a suction truck until the situation returned to normal. It was a short-term malfunction and the monthly mean value of treated effluent complied with the permit limits.

A separate treatment process for the filtrates from the sludge treatment system at the Kaipola mill was launched towards the end of summer 2014. Solids can now be effectively recovered from the filtrates. The quantity of solids and COD loads in the effluent that is taken to the treatment plant has decreased and the fluctuation in effluent quality has lessened. Furthermore, the treated effluent's COD load has slightly decreased and fluctuation has evened out.

Environment-related feedback gets processed

In January, UPM was informed of noise caused by the processing and transportation of forest residue for the Jämsänkoski power plant at Olkkola in Kaipola late at night. Dust generated during transport has also caused intermittent inconvenience. UPM Forest is in charge of these activities. For some years, forest residue has been transported during the summer and chipped during the winter at the industrial area in question. It has been agreed with local residents that the chipping and crushing will take place on weekdays during normal working hours and timber trucks will transport raw material to the area on weekdays only. Trucks transporting wood chips are permitted 24/7.

Other feedback submitted to the mills on environmental issues involved complaints of an unpleasant odour coming from the Kaipola wastewater treatment plant, a disturbing alarm sound at the Kaipola mill, a grey film on the water of the Jämsä River and an unpleasant dust created by ash deliveries at the Jämsä River Mills. In the summer, the local newspaper Vekkari published an article by a reader about an unpleasant odour from the wastewater treatment plant and the speed of heavy traffic at the Kaipola residential area.

Short-term unpleasant odour has continued, on occasion, to spread from the biological treatment plant at Kaipola due to the variable operating periods of the paper machines. The experimental addition of good microbes has reduced long-term odours at the wastewater treatment plant, but the unpleasant odours have not been completely eradicated.

In July the local residents complained about an alarm sounding at night at the Kaipola mill. The source of the sound was investigated and found to be the alarm sound made by a bark conveyor when switched on. However, the alarm was erroneous,

as the conveyor is almost always switched on, and it was therefore eliminated.

In August, UPM was informed that there was a grey film on the water of the Jämsä River close to the downtown area of Jämsä. It was suspected that the film was caused by oil. The cooling water from the Jämsänkoski mill had not introduced any impurities in the river at that time. The nature and origin of the grey film remain unclear.

Dust from ash being transported from the Jämsänkoski mill's power plant to intermediate storage caused temporary harm in the immediate vicinity of the Vierelä landfill site in September. The instructions for covering the loads of ash have been reviewed together with the carrier in charge of transportation. Furthermore, the road leading to the landfill site through residential areas was cleaned and dust was removed.

The police is in charge of the supervision of traffic on public roads, while UPM is in charge of the supervision of traffic in its fenced-in mill areas. UPM has occasionally asked the police to heighten their supervision efforts in the area.

Other enquiries on environmental issues were regarding product safety, the origins of the wood, forest certification schemes and the use of ecolabels. Product safety is especially important in the case of label papers that are used by the food industry. A guarantee for use involving contact with food was obtained for the label papers. It guarantees that the products comply with the German BfR recommendation no. XXXVI and the US FDA regulation 21 CFR, parts 170–189.

Stakeholder co-operation and external assessments

Co-operation with stakeholders was less active this year than during the previous year. The party convention of the Greens was arranged in Jämsä in June. The programme included a visit to the Kaipola mill.

Our operations are evaluated by the authorities and independent external environmental specialists. In May a customer conducted an extensive audit of Kaipola which included environmental issues, chemicals and waste management. No non-conformances were observed in an external audit of the ISO 14001 environmental management system in the autumn.

The Finnish Safety and Chemicals Agency (Tukes) inspected the Jämsä River Mills in June 2014. The inspection focused on industrial processing and storage of hazardous chemicals (Government Decree 855/2012) and safety requirements (Government Decree 856/2012). Another Government Decree applied to the Jämsä River Mills is Government Decree 858/2012 on the Safety Requirements for Liquefied Petroleum Gas Plants.

A safety audit that took place at the mills in August also involved chemical safety. As part of the mill safety practices an extended major sulphur dioxide accident drill took place in March at Kaipola. In addition to the mill personnel and the Central Finland Rescue Services the police participated in the drill.

An external party verified the environmental, personnel and safety data given in the responsibility section of the UPM Annual Report in December. The procedures will be further developed based on the feedback given.

Small observations used as the basis of development

UPM has determined financial, social and environmental responsibility principles and targets for its business. Sustainable products, the climate, the utilisation of forests and waterways, and the waste management are the key focus areas in terms of environmental responsibility.

UPM's goals for 2020 were included in the Jämsä River mills' updated vision for 2017.

The Clean Run procedure has improved the procedures applied to environmental observations and deviations: now the mills are also able to efficiently process any minor observations made. Major non-conformances are systematically processed and agreed corrective measures are implemented to prevent reoccurrence.The goal is that no environmental permit limits will be exceeded 2015 onwards.

A new risk assessment method was introduced as part of the UPM standards, which is also applied to the assessment of environmental risks. The risk assessments used for effluent treatment were updated based on the new method.

The Kaipola Mill received a decision on its environmental permit review application in November 2012. Complaints have been filed against the permit, and these complaints are currently being processed by Vaasa Administrative Court. The review application for the Jämsänkoski Mill and power plant is still being processed by the Regional State Administrative Agency. A review application for the Vierelä landfill site in Jämsänkoski was submitted to the Regional State Administrative Agency of Western and Inland Finland in September.

Phosphorus nutrients at the biological treatment plant were adjusted to better correspond to the wastewater treatment plant's organic load, based on the results of a thesis completed by a student at Jämsänkoski. The results of the thesis can also be used to make further, more advanced controls to the plant.

Pia Siirola-Kourunen, Environmental Manager

Markku Taavitsainen, General Manager

Air

The air emissions of the power plants were below the permit limits. Total emissions of fossil carbon dioxide increased compared to the figures of the previous year at both power plants. The forest energy stocks were lower than in the previous years and peat was used as an alternative fuel. Other emissions remained at about the same level as in previous years.

Fuel demand decreased at the Jämsänkoski power plant. The decreased fuel demand was mainly due to the fact that less paper was produced than during the previous year.

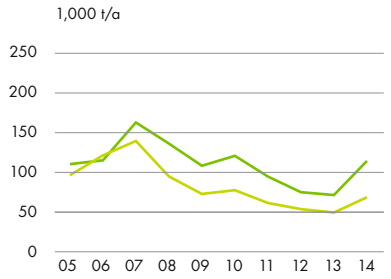
The amount of biofuels – forest energy, bark and sludge – used at the power plants decreased and the amount of peat used increased when compared to the previous year.

When the air quality in the town of Jämsä has been studied by means of particle measurements, the results have been good or satisfactory on average. The key sources of particulates in the air are traffic, heating of buildings and a variety of other, more minor sources. According to the results, industry and energy production plants generate very few particle emissions.

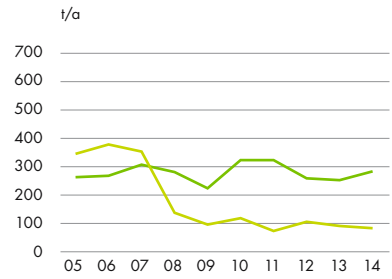
Most nitrogen emissions in the Jämsä region come from road traffic and the production of energy. The nitrogen oxide content measured in the downtown area remains below the guideline value.

In June an environmental permit review application for large power plants in compliance with the Environmental Protection Act was submitted to the Regional State Administrative Agency. The application is for both of the Jämsä River power plants.

FOSSIL CARBON DIOXIDE, CO_2



SULPHUR DIOXIDE, SO_2



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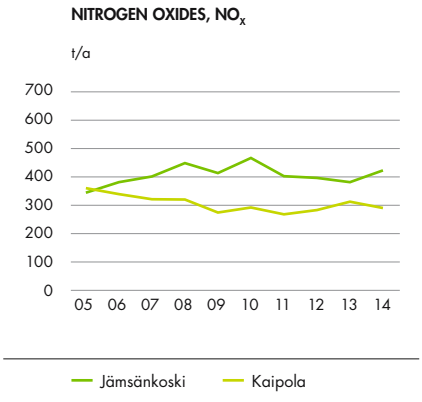
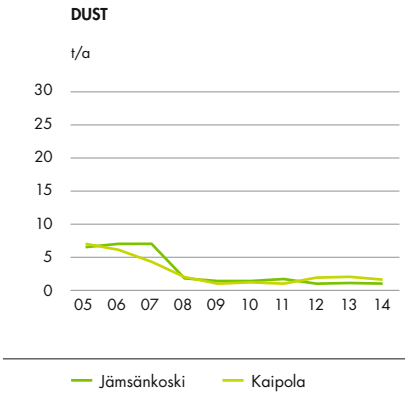
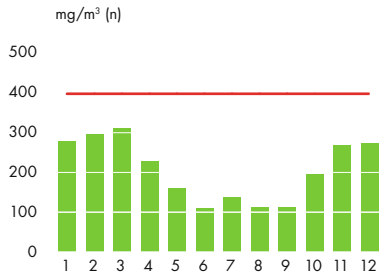


DUST



SPECIFIC EMISSIONS FROM THE POWER PLANT'S MAIN BOILER, JÄMSÄNKOSKI

SULPHUR DIOXIDE, SO_2



SPECIFIC EMISSIONS FROM THE POWER PLANT'S MAIN BOILER, KAIPOLA

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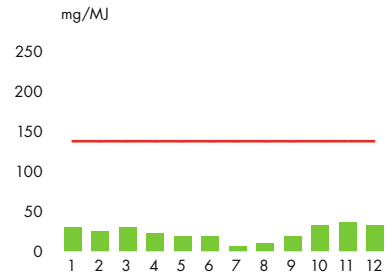

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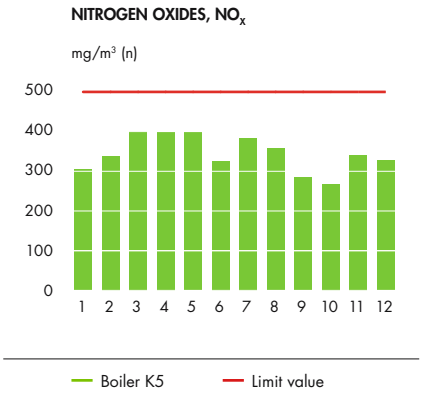

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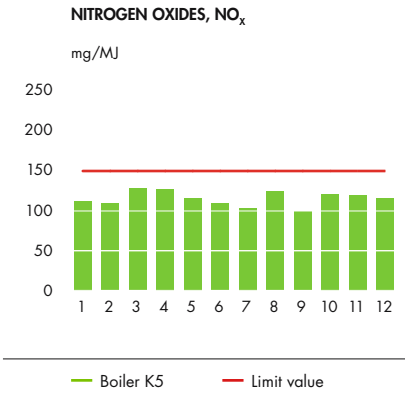


Water

In compliance with the UPM environmental principles, the mills use water responsibly. The target is to minimise the impact of the operations on the local waterways. In a monitoring programme of central Lake Päijänne, it has been noted that most of the nutrient load is caused by scattered loading from forestry and agriculture. The water quality in the monitored area does not limit the occurrence of any demanding fish species.

The amount of process water used per one tonne of paper produced slightly decreased from the previous year.

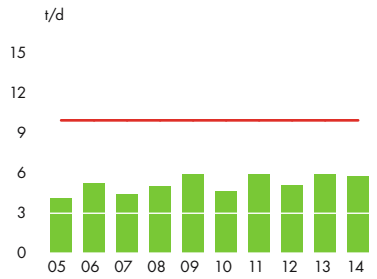
The amount of process water used complied with the target level and the best available technology (BAT ref 2014) level.

The mills' effluent loads remained within the permit limits. The mills' environmental permits specify emission limits for chemical oxygen demand (COD) and phosphorus. The effluent load at the Jämsänkoski mill slightly increased from the previous year in terms of solids, phosphorus and nitrogen. COD remained at the same level as the previous year. The effluent load at the Kaipola mill slightly increased from the previous year in terms of solids and phosphorus. COD decreased and nitrogen load remained at the same level as the previous year.

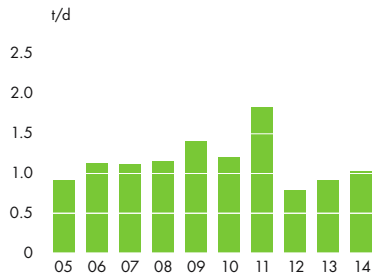
In terms of both COD and phosphorus, the mills' effluent loads complied with the BAT levels (BAT ref 2014). The Commission approved the BAT conclusions for the production of pulp, paper and paperboard in the autumn of 2014. In the future, the permit regulations used in the environmental permit review procedure must be based on the BAT conclusions.

JÄMSÄNKOSKI

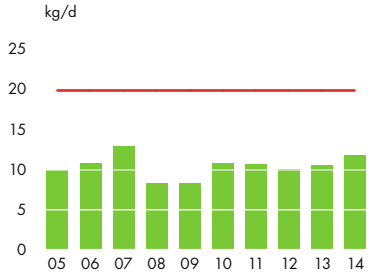
CHEMICAL OXYGEN DEMAND, COD



TOTAL SUSPENDED SOLIDS, TSS



PHOSPHORUS, P



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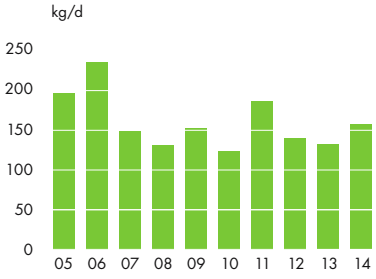
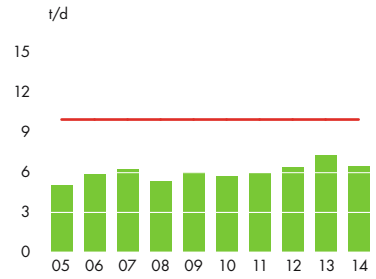


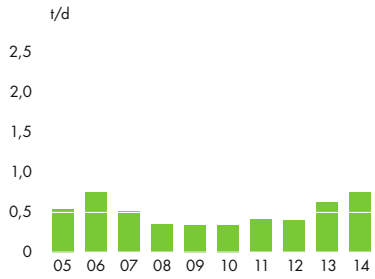
Limit value

KAIPOLA

CHEMICAL OXYGEN DEMAND, COD



TOTAL SUSPENDED SOLIDS, TSS



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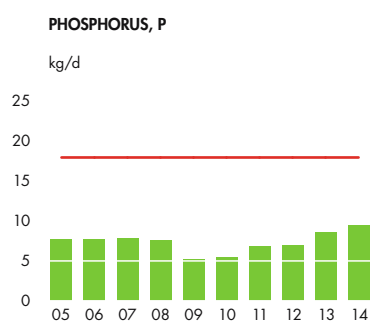

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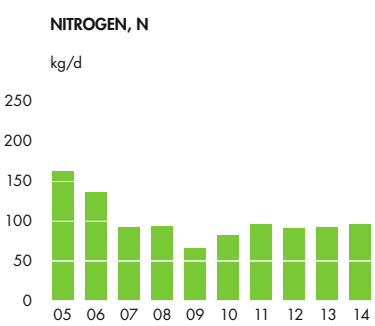


— Limit value

The new chemical water treatment plant at Kaipola being commissioned in the spring of 2015.

Waste

The amount of waste slightly decreased year-on-year at the Jämsä River Mills. The mills were able to reuse all the waste generated during production.

The largest waste fraction at both sites is ash from power plants, which remained at around the same level as in 2013. All of the ash was reused. A significant share of the ash was used for soil improvement, mainly in fields and as a binding material in biowaste composts.

The Finnish Food Safety Authority Evira has approved the use of ash from the Jämsä River Mills in agriculture. The ash has been proven to be highly suitable for improving the soil in fields and forests because it contains high amounts of calcium and important trace elements, such as magnesium and potassium. The ash complies with the requirements of the Finnish Fertiliser Product Act and its properties are reviewed annually.

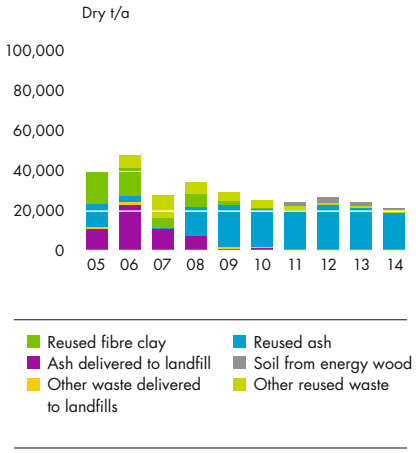
A record amount of ash was used in the reconstruction of forest roads. The ash road service for private forest owners that was launched by UPM Forest two years ago has proven very effective. Ash is used instead of stone material in the construction of forest roads. Ash has been observed to improve both the carrying capacity and the frost heaving resistance of roads.

Part of the Vierelä landfill site at Jämsänkoski was closed down using the ash from the power plants. The construction works to modify the area for the intermediate storage and treatment of waste to be utilised will be completed in the spring of 2015.

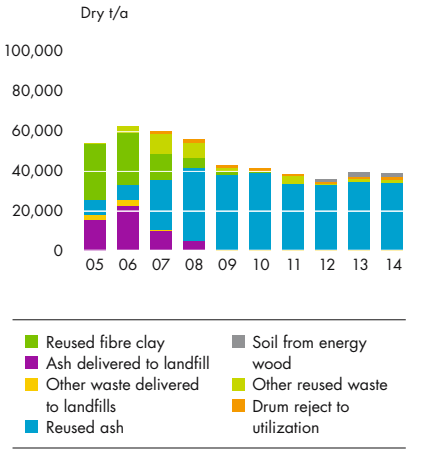
In addition to ash, the most important waste fractions were soil from forest energy and drum reject from the de-inking plant. The deinking reject contains mainly wood fibres and plastic, and it was sent to a local waste management company to be used as raw material for recovered fuel. The soil was reused in the Himos area. Development projects to reduce the amount of soil included in forest energy were continued in 2014.

The mills' waste oils were sent to regeneration plants for reuse.

PROCESS WASTE, JÄMSÄNKOSKI



PROCESS WASTE, KAIPOLA



Environmental parameters 2014

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	Paper	1,600,000 t
Raw materials	Wood Recovered paper Chemical pulp Fillers and coating pigments Process chemicals	See UPM Corporate Environmental Statement for more information. Share of certified fibre at the Jämsä River Mills (PEFC and/or FSC) total 86%.
Energy	Biofuels and fossil fuels Purchased energy	Biofuels 71%, fossil fuels 29% See UPM Corporate Environmental Statement for more information.
Emissions to air	Particulates Sulphur dioxide, SO_2 Nitrogen oxides, NO_2 Carbon dioxide, CO_2 (fossil)	2.6 t 365 t 711 t 182,331 t
Water intake	Process and cooling water	26,780,000 m^3
Discharges to water	Cooling water Effluent volume Chemical oxygen demand, COD Biological oxygen demand, BOD_7 Phosphorus, P Nitrogen, N	9,851,000 m^3 16,879,000 m^3 4,454 t 150 t 7.8 t 92 t
Waste	Waste to landfill	64 t
	Reused waste – Ash – De-inking reject – Soil – other	60,236 t 52,642 t 1,372 t 2,646 t 3,576 t
	Intermediate storage	0 t
	Hazardous waste – of which recyclable waste oil	172 t 71%
Size of mill area	Jämsänkoski and Kaipola	120 ha

The printing papers manufactured at the Jämsä River Mills are used for a variety of purposes, such as product catalogues.

Performance against targets in 2014

TARGETS	TARGET ACHIEVED?	COMMENTS
Reducing water consumption Amount of process water used per one tonne of paper, less than 13 m^3	Yes	Decreased to target level but the flexible operation of paper machines remains a challenge.
Improving energy management Electricity consumption per one tonne of paper less than 2.1 MWh	Yes	Energy-saving projects have been successfully concluded.
Reducing solid losses Solids losses of the paper machines/kg/tonne of produced paper below 20 kg	No	Solid losses at the Jämsänkoski mill decreased from the previous year to the target level.
Ensuring re-use of waste	Yes	100% of the process waste was reused.
Taking care of the environment	Yes	Increasing environmental awareness with the Clean Run procedure. UPM's goals for 2020 were included in the Jämsä River mills' updated vision for 2017.

Environmental targets 2015

TARGET AND INDICATOR	RESPONSIBILITIES BY DEPARTMENT
No Clean Run class 3–5 deviations	Stable operation of the treatment plant. No disturbance emissions from the production lines. Fast reaction, using root cause analysis.
Reducing process water consumption at Kaipola by 3%	Efficient monitoring of consumption and quick reaction to changes.
Reducing the amount of energy used to heat process water at Kaipola by 3%	Efficiently utilising warm cooling water in the manufacture of process water.
Taking into account changes in production at Jämsänkoski in environmental protection	Taking into account new wastewater treatment plant operating methods.

EMAS
Verified environmental management
REG.NO. FI - 000058

VALIDATION STATEMENT

As an accredited environmental verifier (FI-V-0001), Inspecta Sertifiointi Oy has examined the environmental management system and the information of UPM Jämsä River Mills Environmental Performance 2014 report and of UPM Corporate Environmental statement 2014. On the basis of this examination, the environmental verifier has herewith confirmed on 2015-04-01 that the environmental management system, this UPM Jämsä River Mills Environmental Performance report and the information concerning UPM Jämsä River Mills of UPM Corporate Environmental statement are in compliance with the requirements of the EMAS Regulation (EC) No 1221/2009.

MORE WITH BIOFORE

UPM leads the integration of bio and forest industries into a sustainable future characterised by innovation, responsibility and resource efficiency. **www.upm.com**

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