

ENVIRONMENTAL performance in 2015



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 mill units form a single entity, with the Magazine Papers Production Unit producing uncoated magazine paper in Jämsänkoski and coated magazine paper in Kaipola, the Newsprint Production Unit producing directory paper and newsprint in Kaipola, and the Label, Pack & Release Business Unit producing label and packaging paper in Jämsänkoski.

The main raw materials used in paper production at Jämsänkoski are mechanical pulp made of spruce pulpwood for the magazine

papers, and chemical pulp sourced from UPM's own mills and markets for label and packaging paper. 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 six paper machines at the Jämsä River Mills: three at Jämsänkoski and three at Kaipola.

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	1,370,000 tonnes of paper		
Employees	866		
Products	Magazine papers UPM Max UPM Max Lite UPM Max Silk UPM Cat UPM Impresse UPM Impresse Plus UPM Cote UPM Silk UPM Ultra UPM Valor	Newsprint UPM News UPM Brite UPM Book UPM Color UPM EcoBasic UPM EcoLite UPM EcoPrime UPM Opalite UPM Opalite Plus	Label papers UPM Label Papers UPM Packaging Papers
Certificates	EMAS – EU Eco-Management and Audit Scheme ISO 14001 – Environmental Management System Standard EES+ – Energy Efficiency System ISO 9001 – Quality Management System Standard PEFC™ Chain of Custody – Programme for the Endorsement of Forest Certification FSC® Chain of Custody – Forest Stewardship Council® <i>All certificates can be found from UPM's Certificate Finder (available at www.upm.com/responsibility)</i>		
Environmental labels	EU Ecolabel		



The mark of responsible forestry

For FSC products, visit www.fsc.org



For PEFC products, visit www.pefc.org



EU Ecolabel : FI/011/001



EU Ecolabel : FI/037/001

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 19,600 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 at the Jämsänkoski mill is sourced from Lake Koski-Keskinen and the Iso-Ryöni ravine, while the water source for the Kaipola mill is the Tiirinselkä basin in Lake Päijänne. 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 2015 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 2015. 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 2017.

Environmental year 2015

In 2015, 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 procedure Clean Run continued as part of the daily operations.

The Clean Run environmental procedure has increased environmental awareness among personnel, and UPM has continued its work to advance the sharing of best practices within the Group. The UPM-level themes of the Clean Run procedure focused on chemical safety and waste management. The waste sorting guidelines were reviewed at the mills. The waste collection points were also reorganised to better suit their intended purposes, especially at the Jämsänköski mill. As for chemical safety, particular areas of focus include the use of personal protective equipment when handling chemicals, knowledge of the new hazard labels for chemicals, and selecting process chemicals that cause as little harm to the environment as possible.

Although the Step Change in Safety 2012–2014 project ended at the beginning of last year, safety issues still remain equally important. Safety culture and performance at Jämsä River Mills continued to improve, with extremely positive results. In 2015, we finished the work on developing common safety processes, such as the 'Reporting of Process Maintenance Work' method and the associated monitoring model, as well as the revised 'Induction and Guidance Model' for the personnel. A total of over 2100 observations related to improving safety were made by as many as 600 different people. The 'Check for hazards' procedure, implemented to promote safe commencement and completion of work, was expanded.

As part of the regular rescue drills, a major disaster drill simulating a peroxide spill was organised at Jämsänköski in September 2015. The main focus of the drill was on personal safety, the emergency

plan and crisis communication; the possible environmental effects of the chemical on the waterways were also assessed.

The global demand for printing papers continues to decline. The annual production volume of the Jämsä River Mills was lower than in the previous year, and paper machine 5 at Jämsänköski was permanently closed in March 2015. Preparations for the dismantling project of paper machine 5 started in May, and dismantling will be finished by autumn 2016. The demand for label and packaging papers remains steady.

UPM's initiative process was updated by introducing a new method and application. By making the initiative process more active, the company also aims to find initiatives that support a reduction in energy and water consumption, among other things.

In spring 2015, the water intake at the Kaipola mill was moved to the Tiirinselkä basin in Lake Päijänne. The goal of the project is to secure the mill's water supply and to sustain the availability of sufficiently low-temperature cooling water in the summer. This change reduces the use of process water and improves thermal energy efficiency at the mill. Used, warm cooling water is collected and used to produce process water at the chemical water treatment plant. The heat recovery solutions realised as part of the water supply project also reduce the thermal stress conveyed to the biological treatment plant.

Disturbances quickly addressed

An overflow at an effluent pumping station at the Kaipola mill caused a short-term disturbance in January. Around 415 m³ of untreated effluent ended up in Lake Päijänne due to a malfunction of the effluent pumps. The malfunction was caused by the ending of the sealing water which is necessary for pumps. The necessary corrective actions were implemented in the system. The disturbance did not have any impact on the condition of the waterways.

The deviation was classified as a major environmental non-conformance in accordance with the Jämsä River Mills Clean Run procedure. The environmental risk assessment of the pumping station was reviewed as a result of the disturbance.

Environment-related feedback is processed

On some occasions, short-term unpleasant odours have continued to spread from the biological treatment plant at Kaipola. The experimental addition of beneficial microbes has reduced long-term odours at the treatment plant, but the unpleasant odours have not been completely eradicated. Local residents in the nearby areas have also complained about the odours from time to time. The composition of the forest industry effluent varies due to different production situations, and there is no single method that will completely eradicate the unpleasant odours. The chemical phenomena behind the formation of the unpleasant odours are known, and the measures implemented have succeeded in significantly reducing the odours. Feeding liquid oxygen into the effluent piped to the treatment plant has proved the most effective way of reducing the odours. Both mills have been employing this method for several years. Further investigation is still being carried out to find other feasible alternatives.

In March, a local resident in Kaipola complained about a squeaking noise coming from the mill. The issue was investigated and the noise was traced back to a broken roller in a wood chip conveyor. The fault was corrected immediately after the correct source was identified.

A local resident living close to the Kaipola mill voiced concerns about the noise emissions, vibrations and exhaust gases caused by railway traffic to the mill. The fleet employed by the Finnish national railway company VR is considered suitable for rail transport and local needs, and approved by the relevant authorities. Only diesel-powered locomotives can be used

for traffic on the mill site, as the tracks to the mill are not electrified.

Similarly, a local resident living close to the Jämsänkoski mill contacted the company about the noise caused by railway traffic to the east of the mill. Train wagons arrive at and depart from the mill less than ten times per day. This is when regular noise from railway traffic occurs. In the case of both mills, the schedule for replacing the trains is based on VR's railway traffic plan and the framework of the national-level schedule.

In the autumn, a local resident living close to the Jämsänkoski mill reported an unusual noise. Investigations revealed a faulty bearing in a fan located on the mill roof as the source of the noise. The fan was serviced.

It was discovered during UPM's own monitoring process that the ash transported from the Jämsänkoski mill power plant to intermediate storage caused temporary harm in the form of dust and soiled roads on the way to the Vierelä landfill site. The instructions for covering the loads of ash were reviewed, as was the carrier in charge of transportation. The road leading to the landfill site through residential areas was also cleaned and dust was removed.

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 and packaging papers used by the food industry. A certification for use involving contact with food was obtained for the label papers. It guarantees that the products comply with German BfR recommendation no. XXXVI and US FDA regulation 21 CFR, parts 170 to 189.

Continuous improvement while making operations more effective

Our operations are evaluated by the authorities and independent external environmental specialists. No non-conformances related to quality or environmental management were observed in the external audit of the ISO 14001 environmental management system and the ISO 9001 quality system, performed in the autumn.

To improve energy efficiency, UPM introduced a national energy efficiency system (EES+) in Finland. At the Jämsä River Mills, the EES+ system was audited during the aforementioned external audit. The energy consumption per tonne of paper produced has decreased at both mills, especially as a result of the mechanical pulp production development projects carried out in recent years.

As part of the overall safety processes, the occasional soiling of roads caused by the filler sludge during its transport to the mill, was discussed with the external carrier. In addition to the visible nuisance, the filler sludge makes the roads slippery and may pose a risk to traffic safety while contaminating the environment. Neither of these consequences are considered acceptable under any circumstances.

Small observations used as the basis of development

The focus areas, targets and indicators for UPM's responsibility strategy were updated in 2015. The strategy covers financial, social and environmental responsibility. In terms of environmental responsibility, the key focus areas are sustainable products, the climate, the use of forests and waterways, and the waste reduction. Some of the targets are ongoing and have been extended in to 2030. UPM's targets were included in the Jämsä River Mills' updated vision for 2017.

The Clean Run environment procedure has improved the procedures surrounding environmental observations and non-conformances: Even minor observations are now reported and processed more effectively at the mill. Major non-conformances are processed systematically, and agreed corrective actions are implemented to prevent reoccurrence. The goal is to ensure that none of the mill's environmental permit limits are exceeded. Over 100 environmental observations and minor deviations were reported in 2015.

The Vaasa Administrative Court's final decision concerning the Kaipola environmental permit review application arrived in November 2015. A new environmental permit review application for the Jämsänkoski paper mill was submitted at the end of the year. The environmental permits must be reviewed to ensure compliance with any changes in the mill's operations, the BAT conclusions and the new Environmental Protection Act (527/2014). The baseline report for the mill site required by the Environmental Protection Act was also appended to the review application.

An environmental permit review application for the Vierelä landfill site in Jämsänkoski was submitted to the Regional State Administrative Agency for Western and Inland Finland in September 2014. A decision concerning the application has not yet been provided.



Pia Siirola-Kourunen

Pia Siirola-Kourunen, Environmental Manager

Markku Taavitsainen

Markku Taavitsainen, General Manager

Air

Emissions from the power plants were below permit limits. Compared to the previous year, the total fossil carbon dioxide emission levels decreased slightly at the Jämsänkoski power plant and remained at the same level at the Kaipola plant. The forest energy stocks still remained at a relatively low level compared to previous years, and use of peat increased slightly as a result. Other emissions also decreased slightly compared to previous years, especially at Jämsänkoski.

Fuel demand decreased by approximately 17% at the Jämsänkoski power plant. This development is mainly attributable to the reduction in paper production volumes caused by the permanent closure of paper machine 5.

The use of biofuels – forest energy, bark and sludge – remained at the same level compared to the previous year. Their share of the total fuel consumption was approximately 70%. The use of oil amounted to less than 2% of the total at both plants.

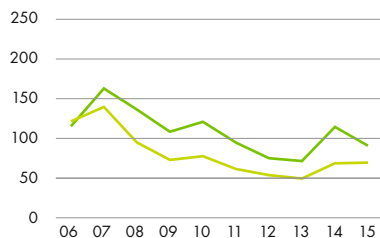
When the air quality in the town of Jämsä has been studied by means of particle measurements, the results have been good or satisfactory on average. The key sources of particulates in the air are traffic, heating of buildings and a variety of other, more minor sources. According to the results, industry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

The Regional State Administrative Agency provided a decision on the environmental permit review application submitted for both of the Jämsä River power plants, concerning large power plants covered by the national transitional plan, in compliance with the Environmental Protection Act.

FOSSIL CARBON DIOXIDE, CO₂

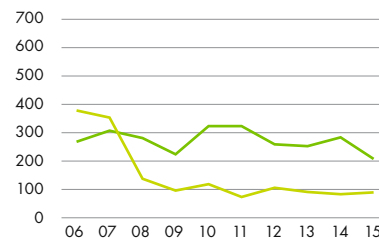
1,000 t/a



Jämsänkoski Kaipola

SULPHUR DIOXIDE, SO₂

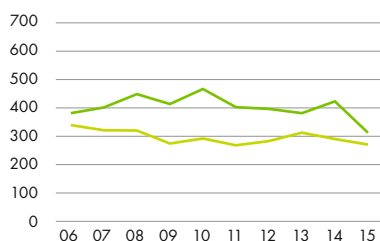
t/a



Jämsänkoski Kaipola

NITROGEN OXIDES, NO_x

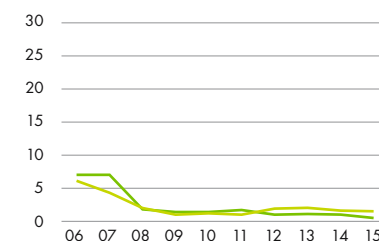
t/a



Jämsänkoski Kaipola

PARTICULATES

t/a

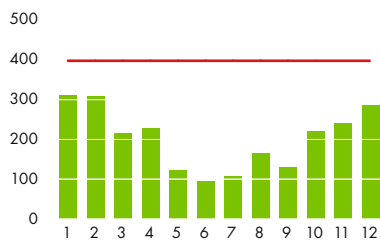


Jämsänkoski Kaipola

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

SULPHUR DIOXIDE, SO₂

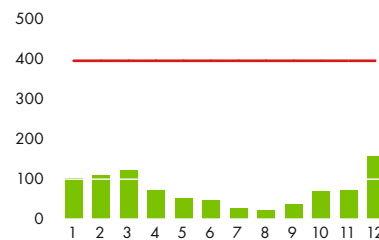
mg/m³ (n)



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

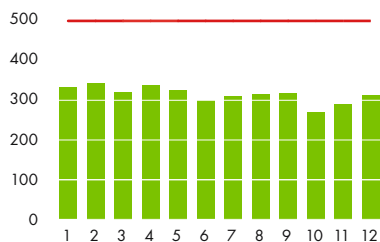
SULPHUR DIOXIDE, SO₂

mg/MJ



NITROGEN OXIDES, NO_x

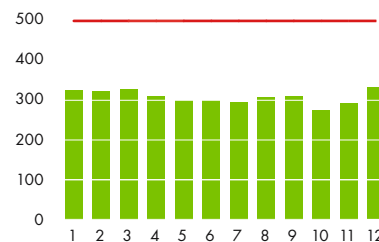
mg/m³ (n)



Boiler K5 Limit value

NITROGEN OXIDES, NO_x

mg/m³ (n)



Boiler K5 Limit value

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

A favourable decrease in the amount of process water used per tonne of paper produced was reported at Kaipola. The amount of process water used complied with the target level and the best available technology level (BAT ref 2014).

The mills' effluent loads remained within the environmental permit limits. In accordance with the new permit decision, tighter limits were set for the chemical oxygen demand (COD) and phosphorus emissions of treated effluent at the Kaipola mill. A new nitrogen emission limit for treated effluent was also set.

Compared to the previous year, the effluent load of the Kaipola mill decreased slightly in terms of phosphorus and nitrogen loads. The effluent COD and suspended solids remained at the same level as the previous year.

The environmental permit for the Jämsänkoski mill includes effluent emission

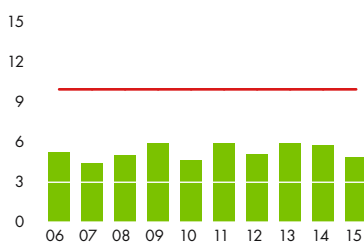
limits for chemical oxygen demand (COD) and phosphorus. Due to changes in production (i.e. the permanent closure of paper machine 5), the effluent load of the Jämsänkoski mill decreased compared to the previous year, in terms of COD, suspended solids, phosphorus and nitrogen.

In terms of COD, nitrogen and phosphorus, the mills' effluent loads complied with the best available technology levels (BAT ref 2014). Operations at the mills comply with BAT conclusions on mechanical pulp and paper production published on 30 September 2014. Techniques representing the best available technology described in the BAT conclusions are employed extensively at the mills. The best available technology requirement is applied to new procurements as well as process solutions.

JÄMSÄNKOSKI

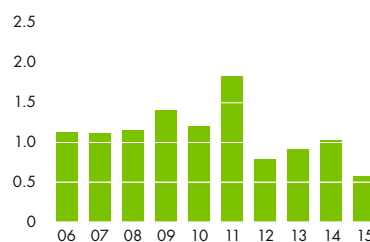
CHEMICAL OXYGEN DEMAND, COD

t/d



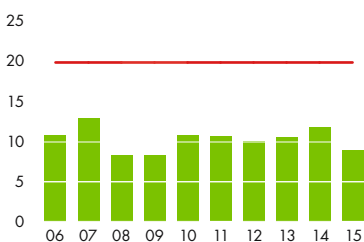
TOTAL SUSPENDED SOLIDS, TSS

t/d



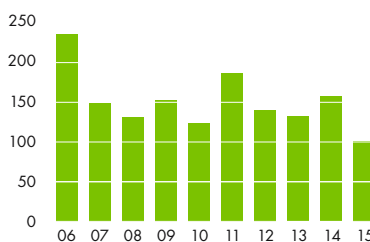
PHOSPHORUS, P

kg/d



NITROGEN, N

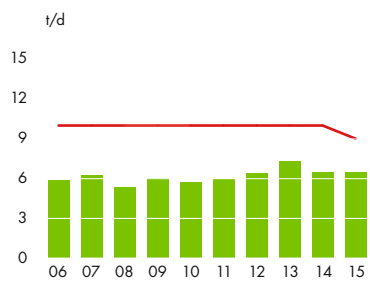
kg/d



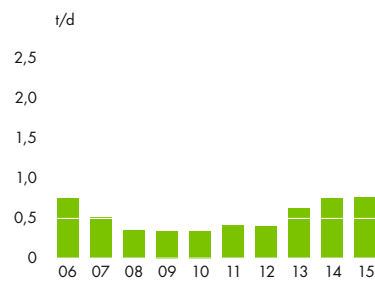
— Limit value

KAIPOLA

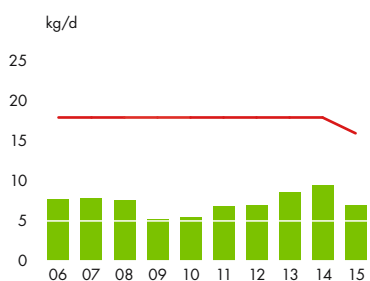
CHEMICAL OXYGEN DEMAND, COD



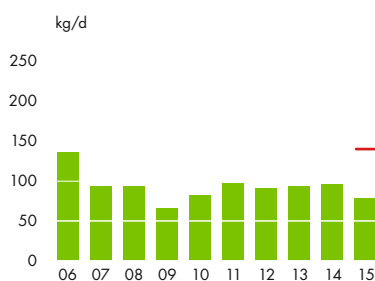
TOTAL SUSPENDED SOLIDS, TSS



PHOSPHORUS, P



NITROGEN, N



— Limit value



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. The amount of ash decreased somewhat compared to the previous year due to the closure of one of the paper machines and a slight decrease in use of recovered paper. All of the ash produced was reused. A significant portion of the ash was used for soil improvement, mainly in fields. Another significant reuse application was reconstruction of forest roads.

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 UPM Forest ash road concept has proved an effective solution. 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 Jämsäkoski was closed down using the ash from the power plants. Construction work to adapt the closed area for temporarily storing and handling of waste to be

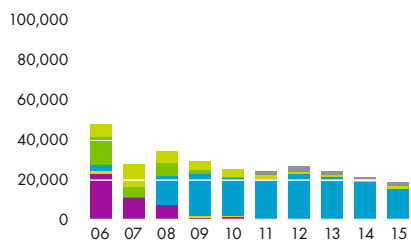
utilised was completed in the autumn of 2015, when the soil layers on the fringe areas were finished.

In addition to ash, the most important waste fractions were soil from forest energy and drum reject from the de-inking plant. As in previous years, the deinking reject mainly containing wood fibres and plastic was sent to a local waste management company to be used as raw material for recovered fuel. The soil was sifted and reused in the Himos area. The wood materials separated in the sifting process were forwarded to the Kaipola power plant for burning. Development projects to reduce the amount of soil in forest energy were continued in 2015.

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

PROCESS WASTE, JÄMSÄNKOSKI

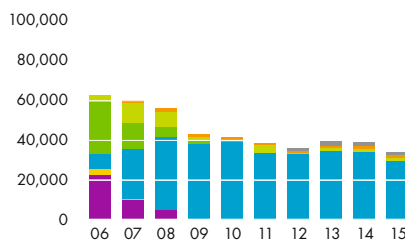
Dry t/a



Reused fibre clay
Ash delivered to landfill
Other waste delivered to landfills
Reused ash
Soil from energy wood
Other reused waste

PROCESS WASTE, KAIPOLA

Dry t/a



Reused fibre clay
Ash delivered to landfill
Other waste delivered to landfills
Reused ash
Soil from energy wood
Other reused waste
Drum reject to utilization



Environmental parameters 2015

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	1,370,000 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 87%.
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)	2.0 t 296 t 581 t 159,553 t
Water intake	Process and cooling water	24,243,000 m ³
Discharges to water	Cooling water Effluent volume Chemical oxygen demand, COD Biological oxygen demand, BOD ₇ Phosphorus, P Nitrogen, N	8,240,000 m ³ 16,003,000 m ³ 4,114 t 164 t 5.8 t 65 t
Waste	Waste to landfill Reused waste – Ash – De-inking reject – Soil – other Intermediate storage Hazardous waste – of which recyclable waste oil	60 t 52,689 t 43,798 t 1,371 t 3,928 t 3,590 t 0 t 188 t 75%
Size of mill area	Jämsänkoski and Kaipola	120 ha



In Jämsä River Mills at Kaipola two-thirds of all paper recovered from households in Finland is used in production of newsprint and directory paper.

Performance against targets in 2015

TARGETS	TARGET ACHIEVED?	COMMENTS
0 piece Clean Run deviations in categories 3 to 5	No	1 piece Clean Run deviation in category 3
Reducing process water consumption at Kaipola by 3%	Yes	Process water consumption at Kaipola reduced by 7% compared to 2014
Reducing the amount of energy used to heat water at Kaipola by 3%	Yes	Heat consumption in production reduced by 7%
Taking changes in production at Jämsänkoski into account in environmental protection	Yes	Environmental permit review application complying with the mill's operations submitted in December 2015

Environmental targets 2016

TARGET AND INDICATOR	RESPONSIBILITIES BY DEPARTMENT
Increasing the reliability of the Kaipola waste water treatment plant	Agreed measures to improve operations implemented No major disturbances from the production lines
Further development of water supply at Kaipola	Summer and winter operation models devised with water use and efficient use of heat energy taken into consideration
Sulphur dioxide no longer used for bleaching at Jämsänkoski	Testing of other methods completed and decisions made
Amount of waste sent to landfill from the Jämsä River Mills reduced from 60 to 40 t/a	Effective sorting of process waste Local waste management company's commitment



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 2015 report and of UPM Corporate Environmental statement 2015. On the basis of this examination, the environmental verifier has herewith confirmed on 2016-04-06 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. Biofore stands for innovation, responsibility and efficiency.
www.upm.com



www.upm.com

UPM-Kymmene Corporation Jämsä River Mills

Tel. +358 2041 6161

Jämsänkoski
Tiilikantie 17/P.O. Box 35
FI-42301 Jämsänkoski, Finland

Kaipola
Tehtaankatu 1
FI-42220 Kaipola, Finland

For further information, please contact:

info.jamsa@upm.com

Pia Siirola-Kourunen
Environmental Manager
Tel. +358 2041 67556
pia.siirola-kourunen@upm.com

Pekka Rantala
Environmental Engineer
Tel. +358 2041 67567
pekka.a.rantala@upm.com