

ENVIRONMENTAL performance in 2015



UPM Kymi



The UPM Kymi mill is located in Kouvola, by the river Kymijoki.

UPM Kymi

The UPM Kymi mill in Kuusankoski, Kouvola, Finland consists of a paper and pulp mill. The Kymi production plants form a modern integrated mill site that produces coated and uncoated fine paper and bleached birch and softwood pulp. In 2015, Kymi employed approximately 700 people.

The paper mill is divided into two production units. Paper machine 8 and the coater form a production line that produces coated fine paper. The high-quality printing paper is delivered in reels and sheets. Paper machine 9 produces uncoated fine paper on reels and in sheets to be used as printing paper, forms and envelopes as well as copier/printer paper. The pulp mill's two fibre lines produce bleached soft-

wood and birch pulp. A sawdust digester is used to cook sawdust pulp that is added to the birch pulp. The majority of the pulp is currently used at the paper mill, but the amount of pulp sold to external customers is growing.

The production plants receive the heat energy and most of the electricity they need from the pulp mill's energy production and Kymin Voima Oy's biofuel power plant located on the mill site. Schaefer Kalk Finland Oy's PCC plant is also located on the mill site.

Kymin Voima Oy's biofuel power plant and the PCC plant are not included in the scope of this report.

Production capacity	800 000 t Coated and uncoated fine paper 700 000 t Birch and pine pulp
Personnel	700
Products	Printing papers: UPM Finesse (gloss, premium silk, matt, silk), UPM Fine Office papers: UPM PreLaser, UPM PrePersonal, UPM Form, UPM Letter, UPM Letter Insert, UPM Office (multifunction, copy/print), New Future (multi, laser), Yes, KymLux (Business, Classic, Premium), KymUltra Digi papers: UPM Digi Fine, UPM Digi Fine Pro Special papers: UPM Jetlabel Pulp: UPM Betula, UPM Conifer Thermal energy and electricity
Residues	Tall oil, turpentine
Certificates	EMAS – EU Eco-Management and Audit Scheme ISO 9001 – Quality Management System Standard ISO 14001 – Environmental Management System Standard ETJ+ – Energy Efficiency System OHSAS 18001 – Occupational Health and Safety System Standard PEFC™ - Programme for the Endorsement of Forest Certification FSC® - Forest Stewardship Council All certificates can be found from UPM's Certificate Finder (available at www.upm.com/responsibility)
Environmental labels	EU Ecolabel UPM pulp products have the approval for use in EU Ecolabel and Nordic Ecolabel paper products.

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



UPM Kymi Environmental performance in 2015 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 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.



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FI/11/001

Environmental year 2015

In paper products, the market situation was slightly weaker in 2015 than in the previous year. In 2015, the paper mill's production volume decreased by around 3% year-on-year. The pulp mill set a new annual production record in 2015. The volume of pulp sold to third parties continued to grow and formed more than 30% of the pulp mill's annual production in 2015.

Environmental protection obligations were systematically covered in compliance with the environmental permit. All mill emissions complied with the permit conditions. We were able to reduce our environmental load to some extent.

The integrated mill site's environmental objectives included: compliance with the Clean Run programme that was launched in 2011, reduction of abnormal emissions, efficient flow of information and use of the Clean Run programme, decrease of water consumption and solid losses, as well as increased reuse of process waste.

The Clean Run programme was part of the Kymi mill site's normal operations

in 2015. All abnormal emissions were recorded with the Clean Run tool and their underlying causes were studied. The Kymi mill site has not exceeded any of its environmental permit limit values since the launch of Clean Run. An environmental review was arranged once a week during the pulp and paper mill morning meeting to review environmental issues and events of the previous week in more detail.

In 2015, environmental training for the personnel focussed on the sorting of waste and the new Waste Act that came into force at the beginning of 2016.

Six pieces of stakeholder feedback were received in 2015. Four stakeholders commented on the unpleasant odour in the vicinity of the mill due to malodorous gases, one commented on lime sludge that was accidentally spilt on the road during transport and one commented on green liquor dregs spilt on the road.

Reform and development projects of the Kymi pulp mill, which are part of the Kymi-700 project, were completed in 2015. Investments included a new debarking

plant, a new drying machine, elimination of bottlenecks from the softwood line, a new oxygen reactor for the softwood line, a new knoter and a new scrubber. These investment projects have already been taken into account in the current environmental permit.

In 2015, the Kymi mill site continued a waste reuse development project that was started in 2013 in cooperation with an external partner. The project aimed at improving the reuse rate of the mill's process waste in preparation for the ban on taking organic waste to landfills that came into force at the beginning of 2016. The project will continue in 2016.

Environmental investments in 2015 included increasing the wastewater cooling capacity to improve the reliability of the wastewater treatment plant, installation of surface aerators for the pre-aeration stage, measures aiming at reducing the natural gas boiler's NOx emissions, improving the runoff water processing system of the yard area and adding another oxygen stage for the softwood line.




Markku Laaksonen
General Manager


Päivi Hyvärinen
Environmental Manager

Air

The mill met all environmental permit limits for air emissions.

The total amount of gaseous sulphur emissions somewhat increased and the total amount of malodorous sulphur compounds somewhat decreased from the previous year.

Total NO_x emissions slightly increased from the previous year due to the high production level of the pulp mill. However, NO_x emissions per one tonne of pulp decreased by almost 6% year-on-year.

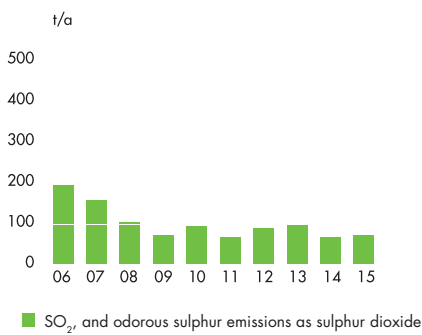
99.5% of weak malodorous gases and 100% of strong malodorous gases were recovered and burned.

TRS emissions at the Kouvola City Environmental Services' measuring station in central Kuusankoski remained very low. The average hourly content did not exceed 5 micrograms/m³ during any hours in 2015. There have been no average hourly content values exceeding 5 micrograms/m³ since 2013.

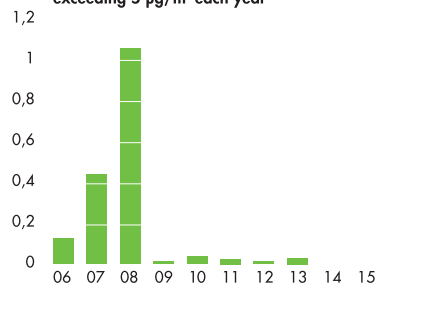
CO₂ emissions increased from the previous year in 2015 because the annual utilisation rate of Kymin Voima was lower than in the previous year and the auxiliary boiler was used to generate energy for the paper mill from natural gas. CO₂ consumed by the PCC plant was no longer deducted from the CO₂ figures since 2013.

The pulp mill's emissions to air complied with the current BAT documentation in all respects.

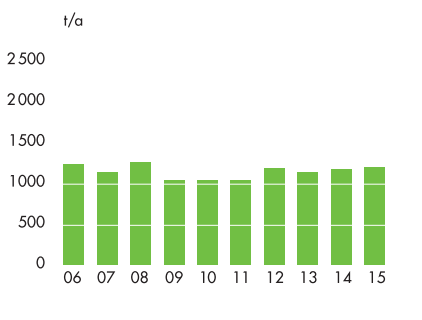
GASEOUS SULPHUR EMISSIONS, SO₂ (*



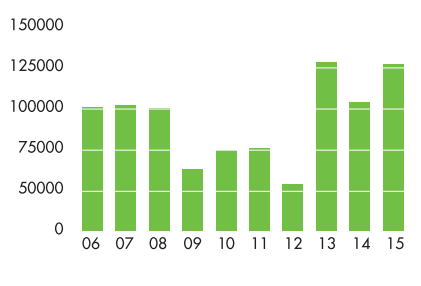
Percentual share of hourly average TRS values exceeding 5 µg/m³ each year



NITROGEN OXIDES, NO_x (*



**FOSSIL CARBON DIOXIDE
*PCC-related carbon dioxide decreased until 2012**



* Includes Kymin Voima Oy's emissions with regard to the energy consumed by Kymi.

Waste

The total amount of waste for 2015 was approximately 25,200 tonnes, of which approximately 6,900 tonnes was taken to a landfill (the municipal landfill or the Lamminmäki landfill). In 2015, 6,516 tonnes of waste (as dry matter) was taken to the Lamminmäki landfill, which means that the amount of waste taken to the landfill was reduced by around 3% year-on-year. The amount of green liquor dregs reduced from the previous year, mainly because more than 2,600 tonnes of green liquor dregs was used in structures needed when closing down the Sulento landfill. Furthermore, 902 tonnes of green liquor dregs were combusted in the Kymi Voima Oy boiler during a test.

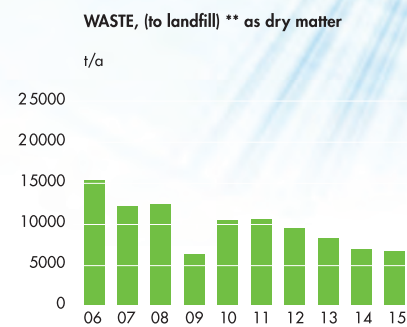
Nevertheless, green liquor dregs produced in the recovery process still formed the most significant waste component taken to the Lamminmäki landfill. No continuous solution has been found for the recycling of green liquor dregs, but one of the mill's key objectives is to find permanent recycling options in the future.

Around 5,600 tonnes of ash was reused in 2015. As before, ash created during the generation of bioenergy was delivered for granulation, after which it was applied to forests owned by UPM. The idea is to recycle nutrients brought to the mill in the wood back into the forest. Other important uses for recycled ash in 2015 were structures used when closing down the landfill and earthwork. Furthermore, a small amount of ash was temporarily stored at the Kymi mill area in 2015.

Around 2,000 tonnes of bark and wood waste was delivered to be reused as culture medium raw material in 2015.

UPM's Zero Solids Waste project started in 2015. The project's long-term goal is finding reuse applications for all of the mill's process waste types by 2030. The plan is to not take anything to a landfill at that time, as all of the materials can be reused. UPM Kymi has been selected as the project's pilot mill.

** Includes Kymi Voima Oy's ash corresponding to the energy used by Kymi



The amount of waste taken to landfill decreased last year. Reducing waste is one of UPM's continuous targets. Teija Ahola, environmental technician at the Kymi mill, and Marko Hjelt, sales negotiator at Lassila & Tikanoja, say that for example the sorting of energy waste has improved at the Kymi mill.



The New Future office paper communicates UPM's Biofore-thinking through the Responsible Fibre ingredient brand which verifies that the fibres used in the product comply with the industry's most demanding responsibility criteria as defined by UPM. The Kymi paper mill produces the New Future Multi and New Future Laser papers.

Water

Performance of the biological treatment plant was good. The reduction levels indicating the efficiency of the treatment plant were 99% for biological oxygen demand (BOD) and 74% for chemical oxygen demand (COD). The solids reduction rate was 98%. The effluent load to the river remained below all the environmental permit limits throughout the year.

The COD and AOX loads (t/d) remained at the same level as in the previous year even though the pulp mill achieved a new annual production record in 2015. This means that the COD and AOX loads decreased year-on-year. The nitrogen and phosphorus loads were lower than during the previous year. The amount of solids from the biological treatment plant clearly decreased from the previous years

due to good sedimentation of the sludge and steady operation of the treatment plant.

The paper mill's solids loss remained at the same level as in 2014. The goal is to further decrease the amount of solids being released from the paper mill to the treatment plant.

In 2015, the Kymi mill site used a total of 83 million cubic metres of water. The consumption of water increased year-on-year because the pulp mill's production volume was almost 10% higher than in 2014.

Process water consumption per one tonne of paper produced remained at the same level as in the previous year, whereas the pulp mill's water consumption per one

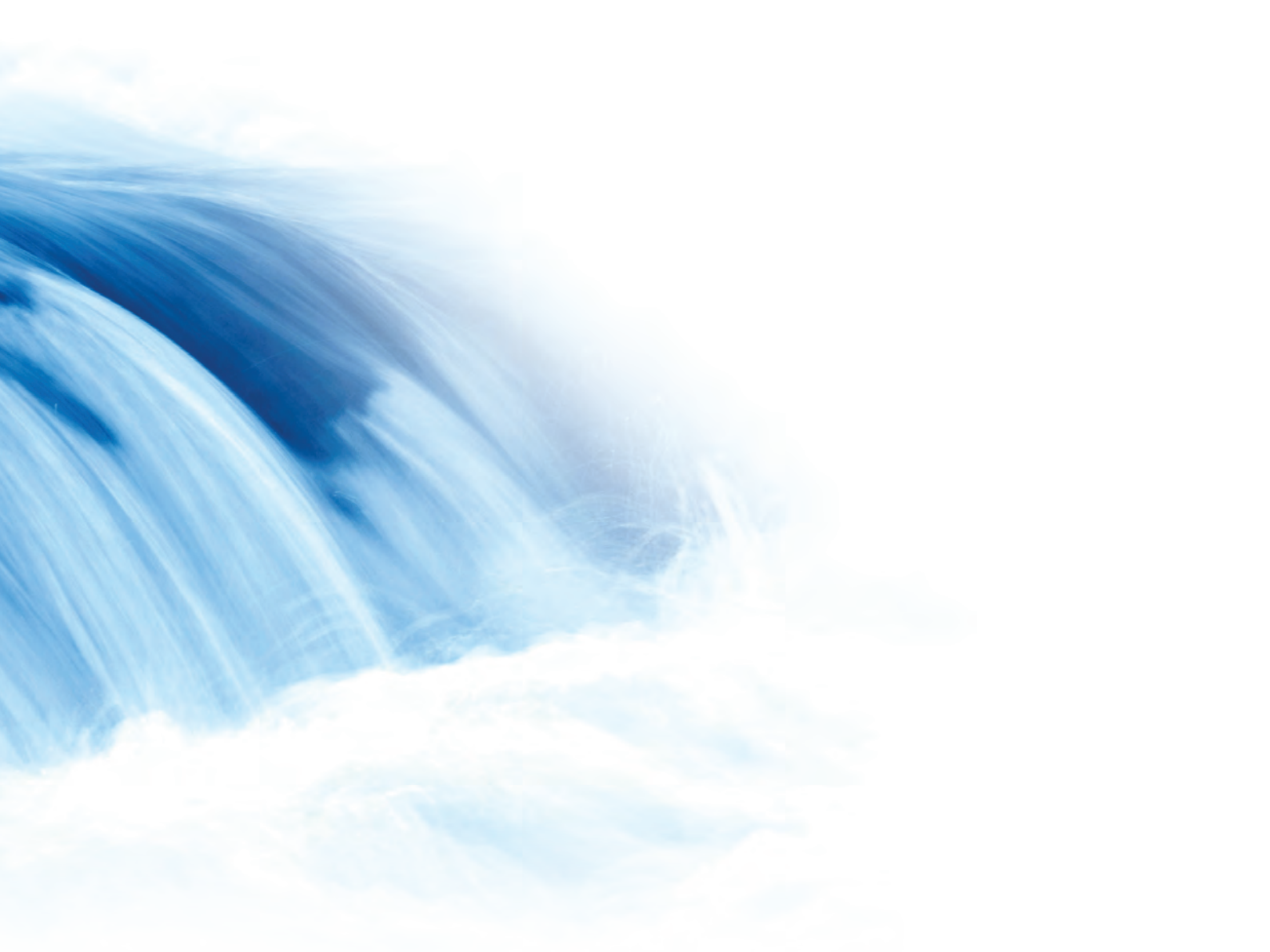
tonne of pulp produced slightly decreased year-on-year. However, the mill's internal goals of <math><10\text{ m}^3</math> per tonne of paper and <math><45\text{ m}^3</math> per tonne of pulp were not reached. Nevertheless, the results achieved by both the pulp and the paper mill remain below the upper effluent limit of the BAT (Best Available Techniques) reference.

In summary, the effluent load of the pulp and paper mill remained at or below the BAT reference limit throughout 2015.

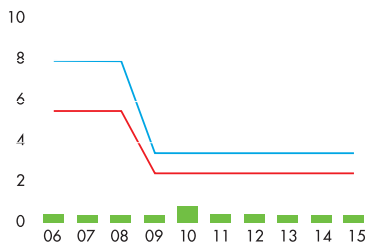
Construction of cooling towers started in 2015 in order to improve the cooling capacity of the wastewater going to the effluent treatment process and thus improve operational reliability of the wastewater treatment plant.



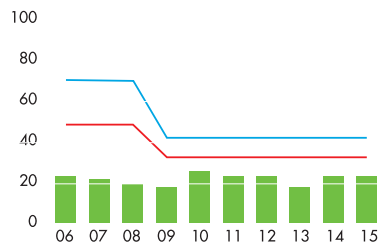
The construction of cooling towers for the biological effluent treatment plant will be completed during the summer. Foundation for the towers was laid in March.



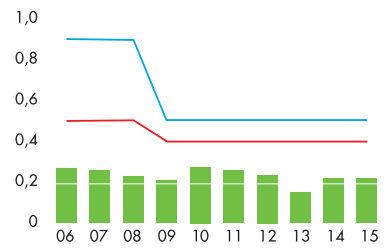
**EFFLUENT LOAD
BIOLOGICAL OXYGEN DEMAND, BOD₅**
t/d



**EFFLUENT LOAD
CHEMICAL OXYGEN DEMAND, COD_{Cr}**
t/d

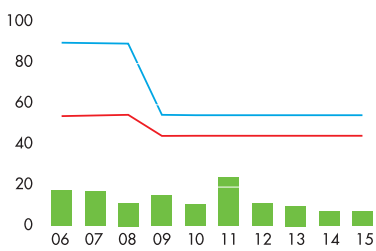


**EFFLUENT LOAD
ORGANIC CHLORINE COMPOUNDS, AOX**
t/d



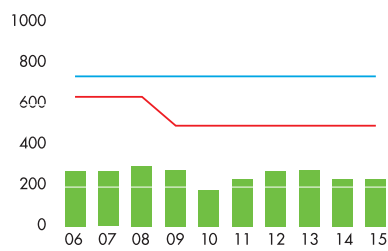
EFFLUENT LOAD, PHOSPHORUS, P

kg/d



EFFLUENT LOAD, NITROGEN, N

kg/d



— Permit limit, monthly mean value

— Permit limit, annual mean value

Environmental parameters 2015

The environmental indicators in this table are based on the total pulp and paper production volume of the UPM Kymi mill. The figures on production and the consumption of raw materials and energy are given as whole figures at group level in the UPM Corporate Environmental Statement 2015.

Production capacity	Coated and uncoated fine paper Pulp	800,000 t 700,000 t
Raw materials	Wood Purchased pulp Chemicals	Please see the UPM Corporate Environmental Statement for information
Energy	Biofuels Fossil fuels	Biofuels 87% Fossil fuels 13% (includes natural gas used for drying in the paper machine)
Emissions into air	Sulphur SO ₂ Nitrogen oxides Carbon dioxide, CO ₂ (fossil) Particulates	82,1 t (SO ₂ and malodorous sulphur emissions as sulphur dioxide) 1 198 t 126 734 t 26 t
Water intake	Process and cooling water	83 035 559 m ³
Discharges to water	Cooling water Effluent COD _{Cr} BOD ₇ AOX Phosphorus, P Nitrogen, N	45 916 680 m ³ 37 118 879 m ³ 8 354 t 103,7 t 80,1 t 2,06 t 81,88 t
Waste	Waste to landfill (as dry matter): Green liquor dregs Slurries Lime, lime sludge Mixed waste Process waste Recycled waste (as dry matter): Slurries Ash Green liquor dregs Lime sludge Bark and wood waste Cores and wrapping Waste paper and cardboard Metal Combustible waste Concrete waste Organic waste Temporarily stored waste intended for reuse (as dry matter): Ash Hazardous waste	4 807 t 640 t 1,061 t 366 t 8 t 640 t 5,610 t 3,513 t 528 t 2,087 t 3,366 t 63 t 1,799 t 765 t 21 t 23 t 263 t 153 t
Size of mill area		250 ha

The figures include Kymin Voima Oy's waste and emissions with regard to the energy consumed by Kymi.

Achievement of objectives for 2015

OBJECTIVES AND INDICATORS	ACHIEVED	COMMENTS
Minimising environmental non-conformances Classes 3 to 5: 0 cases	Yes	None of the permit limits were exceeded.
Efficient use of the Clean Run programme and efficient flow of information	Yes	Internal alarm limits calibrated. Abnormal emissions recorded and discussed in morning meetings.
Processing time of Clean Run notifications less than three months	Yes	Systematically discussed in morning meetings.
Increasing the percentage of waste reuse: Goal: increasing the utilisation rate by 15% from the 2014 level	No	Achieved rate around 9%.
Waste containing more than 10% organic material taken to a landfill 0 t	Yes	Investments made in the sorting of waste.
Finding a reuse application for green liquor dregs	Partially	New test run at Kyrmin Voima completed. Green liquor dregs used in the structures needed when closing down the landfill.
Reducing water consumption	No	Not achieved at the pulp and paper mill.
Reducing solids losses	Yes	Achieved level: 10 kg/t Maintained at the paper mill.
AOX load in the river less than 0.17 kg/t	Yes	The AOX load remained below the EU ecolabel target level.



The pulp mill expansion investment completed in 2015 included for example a new pulp drying machine. The mill has two bailing lines.

Development areas for 2016

OBJECTIVES AND INDICATORS	SCHEDULE	UNITS' RESPONSIBILITIES
Minimising environmental non-conformances Classes 3 to 5: 0 cases	2016	Smooth operation of the treatment plant and control of emissions into the air.
	June/2016	Wastewater cooling tower investment.
	2016	Increasing environmental awareness among employees.
Processing time of Clean Run notifications less than three months	2016	Systematically reviewed in morning meetings.
Efficient use of the Clean Run programme to correspond to the current production level and studying root causes of problems.	2016	Calibration of internal alarm limits
Solid waste to a landfill less than 12.5 kg ka/t of pulp	2016	Kymi as the pilot mill in the Zero Solids Waste project.
Increasing the reuse of waste increasing the utilisation rate by 10% from the 2015 level	2016	Finding new ways to re-use ash and green liquor dregs. Continuing the green liquor dregs tests at Kymin Voima. Studying the opportunity to reduce the amount of green liquor dregs by technical means in the process.
COD from pulp less than 100 t/d	2016	Optimising scrubbing.
Reducing solids losses of pulp and paper	2016	Minimising number of tower overturns. Smooth operation.
Reducing water consumption 10% reduction from the 2015 level	2016	Optimising 0 water in compliance with a water balance survey.
Paper mill's water consumption <10 m ³ /t	2016	Optimising the consumption of water.
CO ₂ emissions less than 100 kg/ADt	2016	Reducing the consumption of gas. Maximal operation without disturbances.
Arranging environmental training for the employees	2016	Incl. One Safety and ETJ+ requirements, among others.



VALIDATION STATEMENT

As an accredited environmental verifier (FI-V-0001), Inspecta Sertifiointi Oy has examined the environmental management system and the information of UPM Kymi 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 Kymi Environmental Performance report and the information concerning UPM Kymi of UPM Corporate Environmental statement are in compliance with the requirements of the EMAS Regulation (EC) No 1221/2009.

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