

# ENVIRONMENTAL performance in 2015





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

## UPM Tervasaari

The Tervasaari mill is situated in the centre of the town of Valkeakoski, below the canal between the Mallasvesi and Vanajavesi lakes. As the mill is located right next to a populated area, careful attention must be paid to environmental issues in every-day operations.

The Tervasaari integrated mill site has three paper machines, a power plant, a hydropower plant and a biological effluent treatment plant. Several businesses also operate onsite as tenants. The environmental load caused by the tenants' effluent emissions is included in the data of this report.

The heat required by the Tervasaari mills is produced by the mills' own power plant, and approximately one fifth of the electricity needed is produced at the mill. Heat is also sold to external users as district heating and steam.

The Suikki industrial landfill at the Tervasaari mill was in use throughout 2015. Closure of the old Kalatonlahti industrial landfill continued according to plan.

UPM Tervasaari is an important centre of expertise in the area of label papers, with a strong focus on the development of existing paper grades and new products.

<b>Production capacity</b>	300,000 t/a	
<b>Personnel</b>	330	
<b>Products</b>	<b>Label papers (Base):</b> UPM Brilliant UPM Brilliant evo UPM Brilliant light UPM Brilliant pro UPM Brilliant duo UPM Honey UPM Honey evo UPM Honey light UPM Golden UPM Blue UPM Pacific UPM SCK UPM SCK light UPM Topaz duo	
<b>Certificates</b>	EMAS – EU Eco-Management and Audit Scheme ISO 22000 – Food Safety Management System Standard 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®  <i>All certificates can be found from UPM's Certificate Finder (available at <a href="http://www.upm.com/responsibility">www.upm.com/responsibility</a>)</i>	



UPM Tervasaari Environmental Performance in 2015 is a supplement to the Corporate Environmental Statement of UPM's pulp and paper mills (available at [www.upm.com](http://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.



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



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

# Environmental year 2015

In 2015, the UPM Paper Asia business area successfully implemented its growth strategy and the new paper machine in Changshu started production at the end of the year. The Tervasaari and Jämsänkoski mills achieved new annual production records.

As part of the cost improvement project undertaken by UPM, the profitability programme continued to produce good results throughout the company. The Tervasaari mill level even managed to exceed saving targets. Energy efficiency continued to provide significant additional savings.

Paper production volumes increased in 2015 compared to the previous year due to the investment implemented. The PM 8 investment enabled the manufacture of thin and environmentally friendly label papers and also improved energy efficiency.

The company-wide Clean Run campaign to further improve the management of environmental issues continued. The goals of Clean Run are to increase environmental awareness among the employees and to reduce abnormal emissions. Clean Run encourages all employees to detect, anticipate and actively prevent non-compliance with environmental policies. In 2015, UPM started planning for the new One Safety system. The implementation of this system at the beginning of 2016 improved the generation and handling of various process development reports.

Tervasaari has been very successful in managing environmental issues during the campaign. It was one of the best mills in terms of non-compliance with environmental Clean Run policies in the global comparison of UPM mills. No major environmental non-compliance took place at the

Tervasaari mill in 2015. The set goals for effluent and emissions into the air were achieved with excellent results. Emissions remained clearly below permitted limits. There have been no problems with the effluent treatment process at Tervasaari.

Tervasaari records all environmental feedback from outside the mill in its feedback system. In 2015, Tervasaari received two pieces of feedback related to the operation of the mill. Crushing operations performed by an external contractor lead to some inquiries about the unusual noise, and the closing of the Kalatonlahti landfill generated one dust-related complaint.

Customers continued to submit a large number of enquiries regarding the products and the environmental impact of the manufacturing process. In particular, the number of enquiries regarding product safety has increased. Tervasaari has therefore begun to introduce an ISO 22000 (food safety management) system

and is aiming to achieve certification in 2016.

Our operations continued to be evaluated by the environmental authorities and independent external environmental specialists in 2015.

The unit's energy efficiency increased significantly. We were able to decrease energy and heat losses in energy production and further improve the production volume and efficiency of the solid fuel boiler. Heat recovery from the flue gas purification unit of the solid fuel boiler produced a large proportion of district heating in the city of Valkeakoski and hot water used at the mill unit.

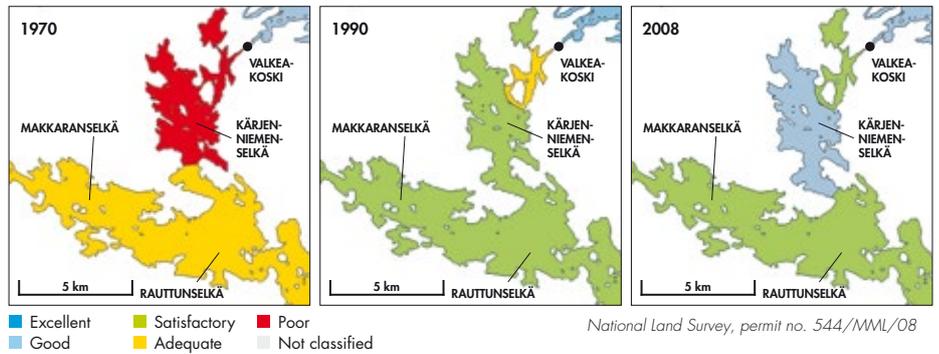
In compliance with its Biofore strategy, UPM is strongly committed to the responsible handling of matters relating to finance, people, society and the environment and to the continuous improvement of its operations at Tervasaari.



  
Harri Hiltunen,  
Manager, Environment and Responsibility

  
Jari Tamminen,  
General Manager

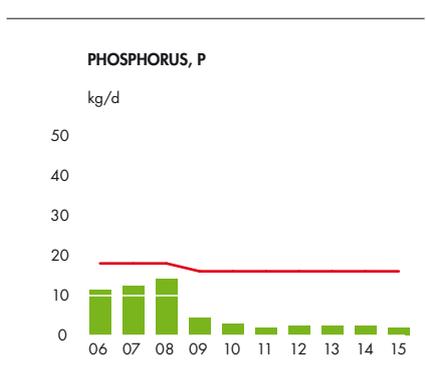
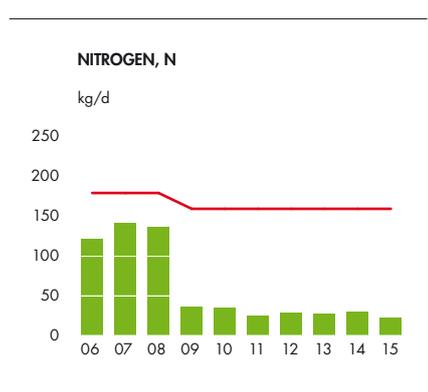
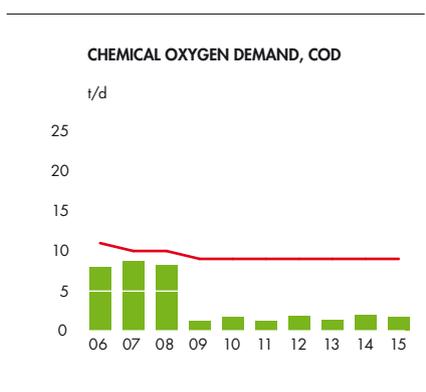
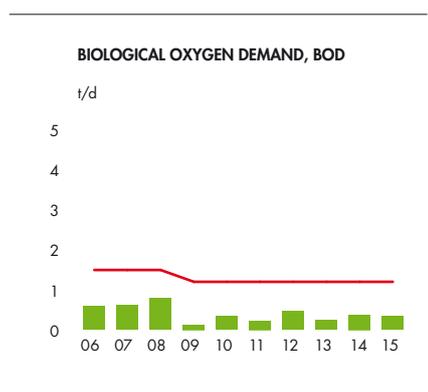
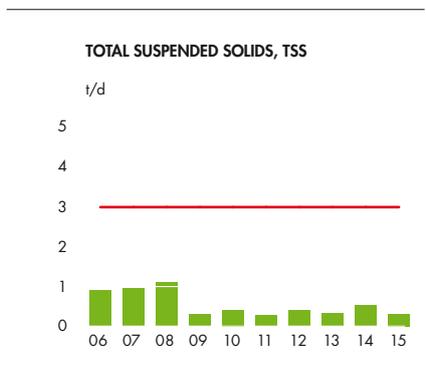
Surface water quality classification for the years 1970, 1990 and 2008 based on samples taken and analysed by the Kokemäki Watercourse Protection Association in the water courses south of Valkeakoski.



## Water

The amount of effluent treated at the Tervasaari effluent treatment plant remained close to the previous year's level, although production volumes at the mill reached a record high. We fell slightly short of the specific water consumption target in production, but reached the target for the amount of solids going to the effluent treatment plant.

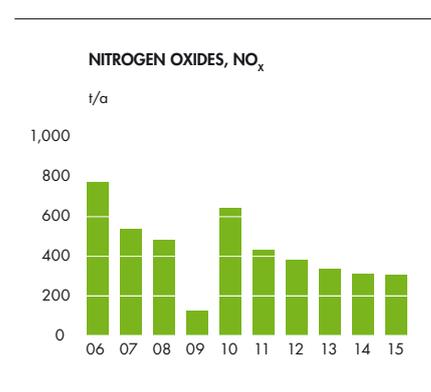
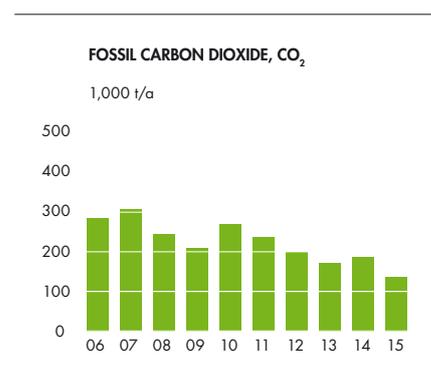
It is also notable that all the measurements related to effluent emissions remained well below the permitted limits, and the internal effluent goals remained below the objectives set for 2015.



## Air

The monitoring of air quality in the urban area continued, similarly to previous years, in co-operation with the town of Valkeakoski and other industrial plants in the region. The community air quality monitoring at Valkeakoski has been carried out according to an agreement between the City of Valkeakoski and six industrial plants whose environmental permits include an obligation to participate in the joint monitoring.

In recent years, the monitoring has followed the levels of sulphur dioxide (SO<sub>2</sub>), nitrogen oxide and inhalable particles (PM<sub>10</sub>) at two measuring stations in downtown Valkeakoski. Environmental protection authorities of Valkeakoski have been in charge of the practical implementation of the monitoring.



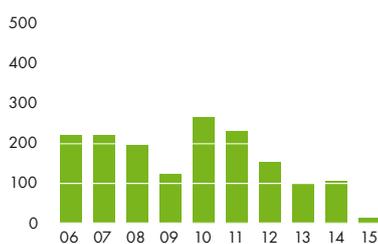
In recent years, industry in Valkeakoski has been through some dramatic changes that have resulted in a decrease in air emissions.

The environmental protection authorities of Valkeakoski requested permission from the authorities overseeing environmental permits to stop monitoring air quality. The Pirkanmaa Centre for Economic Development, Transport and the Environment found that there was no need to continue monitoring community air quality after the current agreement term. Accordingly, monitoring of community air quality was discontinued in Valkeakoski on 31 December 2015.

The summary report for 2015 was not available at the time of writing this report. The quarterly reports show that the limits for nitrogen oxides or sulphur dioxide were not exceeded in 2015 at the health centre measurement point. The daily guideline values for particle concentration in the air (PM<sub>10</sub>), 50 µg/m<sup>3</sup>, were exceeded eight times in the spring and once in the autumn due to dust. According to regulations, the daily guideline values can be exceeded 35 times in a year.

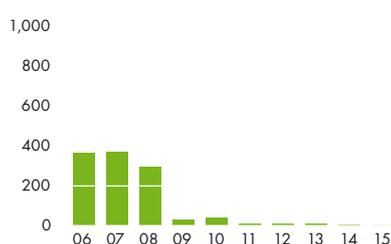
**SULPHUR DIOXIDE, SO<sub>2</sub>**

t/a



**PARTICULATES**

t/a



## Waste

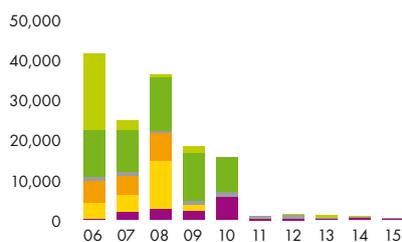
The objective at Tervasaari is to reduce the quantity of waste taken to landfill by minimising waste generated in production and improving waste sorting. Another goal is to find ways to reuse waste – fly ash in particular.

In 2015, bottom ash from a fluidised bed boiler and fly ash were used during the closure of the Kalatonlahti landfill. We were able to maintain the share of reused waste at a high level in 2015: more than 97% of all generated waste was reused. The amount of waste taken to the Suikki landfill decreased significantly compared to the previous year. Leachates from the Kalatonlahti and Suikki landfills are processed at Tervasaari's biological effluent treatment plant.

Tervasaari is involved in UPM's Zero Waste project. One of the targets of the project is to eliminate all solid waste taken to landfills by 2018 by improving the sorting and recycling of waste.

**SOLID WASTE TAKEN TO LANDFILL**

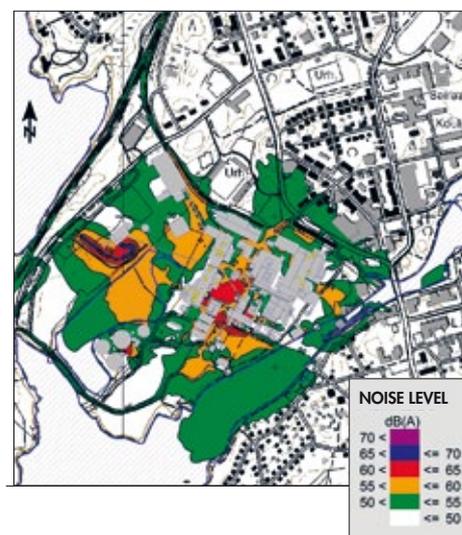
BD t/a



The weights in the image are dry weights.

## Noise

The annual noise measurements defined in the Tervasaari environmental permit were conducted in 2015. The results of the measurements have been reported to the environmental protection authorities of Valkeakoski and the Pirkanmaa Centre for Economic Development, Transport and the Environment.



The noise mapping calculations are based on the Nordic calculation models for road, railroad and industry noise, using the SoundPLAN software solution. The picture represents the average noise level (LAeq7-22) at UPM Tervasaari in the daytime during the summer of 2014.

# Environmental indicators 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.

<b>Production capacity*</b>	Paper	300,000 t
<b>Raw materials</b>	Pulp and chemicals	Information available in the UPM Corporate Environmental Statement.
<b>Energy</b>	Biofuels and fossil fuels	Biofuels 40% Fossil fuels 60%
	Purchased energy	Information available in the UPM Corporate environmental statement.
<b>Emissions to air</b>	Particulates	1.1 t
	Sulphur dioxide, SO <sub>2</sub>	13 t
	Nitrogen oxides, NO <sub>2</sub>	302 t
	Fossil CO <sub>2</sub>	162,400 t
<b>Water intake</b>	Process and cooling water	12,190,800 m <sup>3</sup>
<b>Discharges to water</b>	Clean cooling waters	7,598,000 m <sup>3</sup>
	Process effluent	4,592,800 m <sup>3</sup>
	BOD <sub>5</sub>	121 t
	COD <sub>Cr</sub>	640 t
	Solids	111 t
	Phosphorus, P	0.68 t
	Nitrogen, N	8.2 t
<b>Waste</b>	Landfill waste (dry)	
	– ash	0 t
	– soil and rock	0 t
	– demolition waste	136 t
	– mixed waste (cleaning, gardening etc.)	281 t
	– fibre sludge	43 t
	Reused waste (dry)	
	– metal waste	469 t
	– ash	14,229 t
	– energy waste	1,441 t
	– soil and rock	18.4 t
	– fibre sludge	12.3 t
	– other	86 t
	Hazardous waste	88.8 t
<b>Size of mill area</b>		73 ha



\* The figure does not include the paper production capacity of Billerud-Korsnäs Finland Oy.

The environmental load caused by the operations of the tenants is included in the data of this report.

# Performance against targets in 2015

TARGET(S)	ACHIEVEMENT	COMMENTS
Preventing environmental non-conformances and achieving the Clean Run objectives	Yes	Treatment plant has been reliable. Emissions have been controlled.
<b>Air emissions: Fluidised bed boiler</b> NO <sub>x</sub> , less than 300 mg/m <sup>3</sup> (n) SO <sub>2</sub> , less than 20 mg/m <sup>3</sup> (n) Particulates less than 10 mg/m <sup>3</sup> (n)	Yes	All air emissions were clearly below the target level. Implementation of the new flue gas purification unit had a significant effect on the decrease of the SO <sub>2</sub> and particle emissions.
<b>Reducing water consumption, loss of solids and the amount of solid waste</b> – Water consumption less than 8.2 m <sup>3</sup> /t – Solids loss less than 0.62%	No Yes	Specific effluent consumption on average exceeded the target, but some progress was made in reducing solids loss in paper machines.
Amount of waste taken to landfills less than 500 t/a and improving waste sorting	Yes	Sorting of the types of waste produced by the mill was improved.
Increasing opportunities for reuse of ash	Yes	Fly ash was reused according to plan.
<b>Improving energy efficiency;</b> reduction of natural gas consumption by 100 GWh compared to the 2014 level	Yes	Reduction of the use of natural gas in energy production exceeded the target level.

## Environmental targets 2016

The most significant actions for improving safety and protecting the environment in 2016 will be:

- Preventing environmental non-conformances and achieving the Clean Run objectives: COD less than 1.9 t/d; BOD<sub>7</sub> less than 0.4 t/d, N less than 30 kg/d and P less than 3 kg/d
- Emissions into the air; fluidised bed boiler
  - NO<sub>x</sub> less than 200 mg/m<sup>3</sup>(n)
  - SO<sub>2</sub> less than 20 mg/m<sup>3</sup>(n)
  - Particulates less than 5 mg/m<sup>3</sup>(n)
- Reducing water consumption, loss of solids and the amount of solid waste
  - Water consumption level 8.2 m<sup>3</sup>/t
  - Solids losses 0.62%
  - Amount of taxable waste taken to landfills less than 200 t/a and improving the sorting of waste
- Increasing opportunities for reuse of ash
  - Aim to re-use 100% of fly ash and starting the recycling of bottom ash
  - Participation in one or more ash road projects
- Improving energy efficiency and decreasing fossil CO<sub>2</sub> emissions:
  - Reducing the use of natural gas by 70,000 MWh compared to 2015.



### VALIDATION STATEMENT

As an accredited environmental verifier (FI-V-0001), Inspecta Sertifiointi Oy has examined the environmental management system and the information of UPM Tervasaari Environmental Performance 2015 report and of UPM Corporate Environmental statement 2015. On the basis of this examination, the environmental verifier has herewith confirmed on 2016-04-01 that the environmental management system, this UPM Tervasaari Environmental Performance report and the information concerning UPM Tervasaari 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](http://www.upm.com)



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

## **UPM Tervasaari**

P.O. Box 39  
FI-37601 Valkeakoski, Finland  
Tel. +358 (0)20 416 111

## **For further information, please contact:**

Harri Hiltunen  
Manager, Environment and Responsibility  
Tel. +358 (0)20 416 2643  
[harri.o.hiltunen@upm.com](mailto:harri.o.hiltunen@upm.com)