The Biofore Company UPM

ENVIRONMENTAL
performance in 2014

UPM Tervasaari

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

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 2014. 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.

UPM Tervasaari Environmental Performance in 2014 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 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.

Production capacity	300,000 t/a	
Personnel	330	
Products	**Label papers (Base):**	
	UPM Blue	UPM Honey
	UPM Brilliant	UPM Honey evo
	UPM Brilliant duo	UPM Honey light
	UPM Brilliant evo	UPM Pacific
	UPM Brilliant light	UPM SCK
	UPM Brilliant pro	UPM SCK light
	UPM Golden	UPM Topaz duo
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)*	

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

Environmental year 2014

In 2014, the new UPM Paper Asia business area got up to full speed, and a new strategy was fashioned. The first year was very successful; all mill units in the industry set new production records, and sales increased significantly.

The new short-term profitability programme, along with the EUR 200 million cost-saving programme, was a great success. Saving targets were exceeded both at the company level and at the Tervasaari mill level. We were especially happy to achieve most of the cost savings in Tervasaari by reducing the energy consumption of paper machines and replacing natural gas in energy production with solid fuels, such as logging residue. Some savings were also realised by calculating the paper machines' solids losses.

Paper production volumes increased in 2014 compared to the previous year due to the PM 8 investment implemented in March 2012. 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 the employees to detect and anticipate environmental non-conformances and proactively prevent them.

Tervasaari has been very successful in managing environmental issues during the campaign. It was one of the best mills in terms of environmental Clean Run non-conformances in UPM's global mill comparison. No major environmental non-conformances took place at the Tervasaari mill in 2014. 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. No feedback was received in 2014. Customers continued to submit a large number of enquiries regarding the products and the environmental impact of the manufacturing process. The number of enquiries regarding product safety increased. Our operations continued to be evaluated by the environmental authorities and independent external environmental specialists in 2014.

The unit's energy efficiency increased significantly. We were able to decrease energy and heat losses in energy production and improve the production volume and efficiency of the solid fuel boiler. The monitoring of solid fuel's calorific values was improved by a new sampling process, which provided new information that could be used to address non-conformances in fuel deliveries. Thanks to the modernisation of PM 8, the mill's energy efficiency improved further in 2014; the specific consumption was decreased by approximately 5% from the previous year. At the end of 2014, we made a decision to invest in PM 5's drying unit technology. The investment is expected to decrease steam consumption by almost 10% and it will be implemented in the spring of 2015.

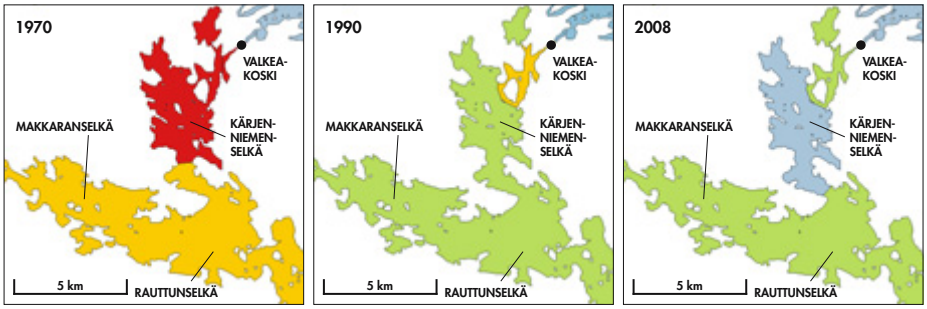
In compliance with its Biofore strategy, UPM is strongly committed to the responsible handling of matters relating to finance, people, society and the environment, and to the continuous improvement of its operations at Tervasaari.

Harri Hiltunen, Safety Manager

Jari Tamminen, General Manager

*) For more information on Clean Run reporting, please see the UPM Corporate environmental statement.

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.



National Land Survey, permit no. 544/MML/08

Water

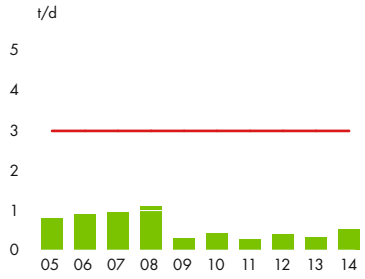
The amount of effluent treated at the Tervasaari effluent treatment plant decreased from the previous year. We fell slightly short of the specific water consumption target in production, but reached the target for the amount of solids going to the effluent treatment plant.

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 2014.

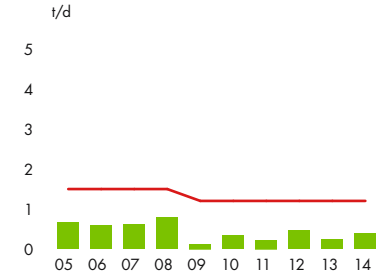
In summary, the mill's effluent load remained at the BAT reference limit throughout the year 2014 (BAT ref 2014).

BAT = Best available techniques

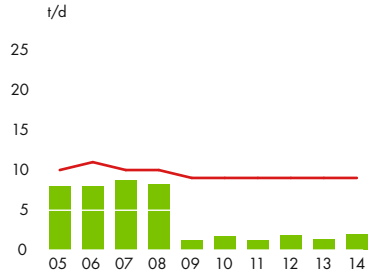
TOTAL SUSPENDED SOLIDS, TSS



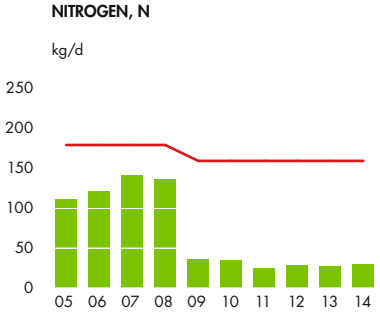
BIOLOGICAL OXYGEN DEMAND, BOD



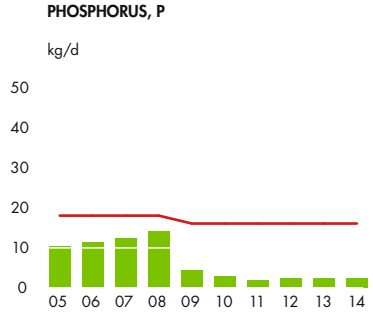
CHEMICAL OXYGEN DEMAND, COD



NITROGEN, N



PHOSPHORUS, P



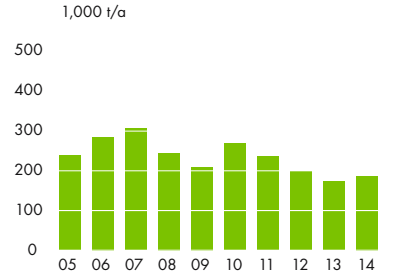
Permit, monthly average

Air

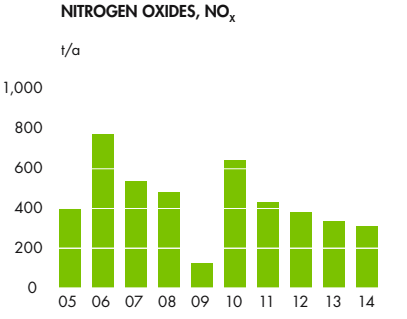
The monitoring of air quality in the urban area continued, similarly to previous years, in co-operation with the town of Valkeakoski and other industrial plants in the region.

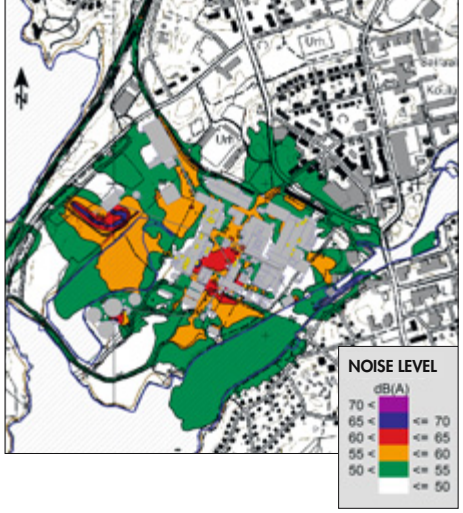
The summary report for 2014 was not available at the time of writing this report. The quarterly reports show that the limits for nitrogen oxides or sulphur dioxide were not exceeded in 2014 at the health centre measurement point. The daily guideline values for particle concentration in the air (PM10), 50 µg/m^3, were exceeded four times due to dust in the spring. According to regulations, the daily guideline values can be exceeded 35 times in a year.

FOSSIL CARBON DIOXIDE, CO_2



NITROGEN OXIDES, NO_x



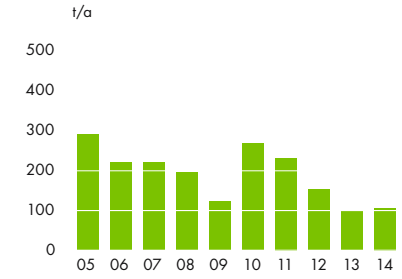


The noise mapping calculations are based on the Nordic calculation models for road, railroad and industry noise, using the SoundPLAN software solution. The picture represents the average noise level (LAeq7-22) at UPM Tervasaari in the daytime during the summer of 2014.

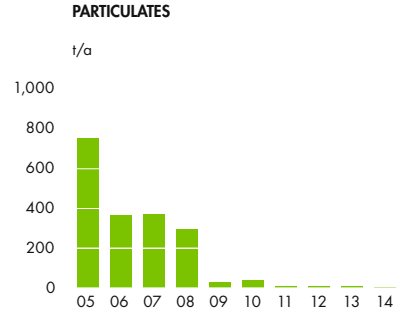
Noise

The annual noise measurements defined in the Tervasaari environmental permit were conducted in 2014. 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.

SULPHUR DIOXIDE, SO_2



PARTICULATES



Waste

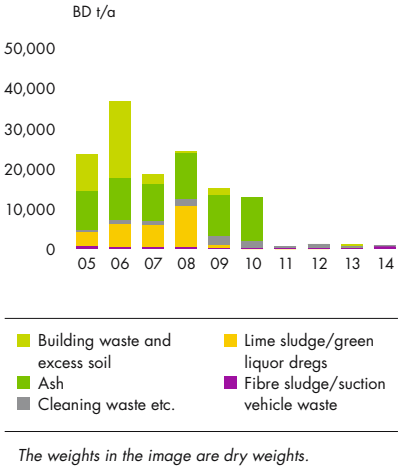
The objective at Tervasaari is to reduce the quantity of waste taken to landfill by minimising waste generated in production and improving waste sorting. Another goal is to find ways to reuse waste – fly ash in particular.

In 2014, 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 2014: more than 87% of all generated waste was reused. The amount of waste taken to the Suikki industrial landfill increased slightly from the previous year due to demolition waste from the mill. Leachates from the Kalatonlahti and Suikki landfills are processed at Tervasaari's biological effluent treatment plant.

Tervasaari has been involved in the local UUMA project in the Tampere Region, associated with the Sustainable Community programme launched by the Ministry of the Environment and organised by the Finnish Funding Agency for Technology and Innovation. The project focuses on promoting the reuse of fly ash and fibre clay from the forest industry in the structural layers of roads, streets and pedestrian and bicycle routes. The use of recycled material saves rock resources but does not completely eliminate the need to use rock material. However, it does save non-renewable gravel resources that are important for water management.

Follow-up surveys on the condition and functionality of the Nokia–Pinsiö road section were performed in 2014. The renovation project was implemented by placing a mixture of fly ash and fibre clay in the lower layer of the gravel road in a 2.7-kilometre section of the road. The amount of fly ash used was approximately one-third of the total amount produced annually in Tervasaari. The survey results show that the road section was clearly in better condition than the comparison structures.

SOLID WASTE TAKEN TO LANDFILL



The weights in the image are dry weights.

Environmental indicators 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	300,000 t
Raw materials	Pulp and chemicals	Information available in the UPM Corporate environmental statement.
Energy	Biofuels and fossil fuels	Biofuels 37.3% Fossil fuels 62.7%
	Purchased energy	Information available in the UPM Corporate environmental statement.
Emissions to air	Particulates	2.5 t
	Sulphur dioxide, SO_2	106 t
	Nitrogen oxides, NO_2	307 t
	Fossil CO_2	186,207 t
Water intake	Process and cooling water	12,451,000 m^3
Discharges to water	Clean cooling waters	7,876,000 m^3
	Process effluent	4,575,000 m^3
	BOD_7	139 t
	COD_{Cr}	712 t
	Solids	191 t
	Phosphorus, P	0.82 t
	Nitrogen, N	10.4 t
Waste	Landfill waste (dry)	
	– soil and rock	9 t
	– demolition waste	24 t
	– cleaning waste	283 t
	– fibre sludge	148 t
	– other	22 t
	Reused waste (dry)	
	– metal waste etc.	784 t
	– ash	12,555 t
	– energy waste	337 t
	– soil and rock	1,871 t
	– demolition waste	433 t
	– fibre sludge	206 t
	Hazardous waste	68 t
Size of mill area		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 2014

TARGET(S)	ACHIEVEMENT	COMMENTS
Preventing environmental non-conformances and achieving the Clean Run objectives	Yes	Treatment plant has been reliable. Emissions have been controlled.
Improving energy efficiency; The mill's condensate return improved by 3 percentage points from the actual value the previous year	No	Controlled process changes in paper production had a negative impact on the amount of condensate return.
Reducing water consumption, loss of solids and the amount of solid waste – Water consumption less than 8.2 m^3/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 landfill less than 1,000 t/a	Yes	Demolition work in the mill site increased the amount of waste slightly. Fly ash was reused according to plan.

Environmental targets 2015

The most significant actions for improving safety and protecting the environment in 2015 will be:

- Preventing environmental non-conformances and achieving the Clean Run objectives: COD less than 2.0 t/d; BOD_7 less than 0.5 t/d, N less than 40 kg/d and P less than 4 kg/d
- Emissions into the air; fluidised bed boiler
  - NO_x less than 300 $mg/m^3(n)$
  - SO_2 less than 20 $mg/m^3(n)$
  - Particulates less than 10 $mg/m^3(n)$
- Reducing water consumption, loss of solids and the amount of solid waste
  - Water consumption level 8.2 m^3/t
  - Solids losses 0.62%
  - Amount of taxable waste taken to landfills less than 500 t/a and improving the sorting of waste
- Increasing opportunities for reuse of ash
  - Aim to re-use 100% of fly ash
- Improving energy efficiency
  - Reduction of natural gas consumption by 100 GWh compared to the 2014 level.

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 Tervasaari Environmental Performance 2014 report and of UPM Corporate Environmental statement 2014. On the basis of this examination, the environmental verifier has herewith confirmed on 2015-03-31 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.

UPM

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
Safety Manager
Tel. +358 (0)20 416 2643
harri.o.hiltunen@upm.com

UPM Fine, 140 g/m^2. Printed in 6/2015.