The Biofore Company UPM

Environmental performance in 2016

UPM Rauma

UPM Paper ENA (Europe and North America) is the world's leading producer of graphic papers, offering an extensive product range for advertising and publishing as well as home and office uses. The high performing papers and service concepts of UPM add value to our customers' businesses, while actively fulfilling demanding environmental and social responsibility criteria. With headquarters in Germany, UPM Paper ENA employs approximately 8,000 people. To learn more about UPM Paper ENA visit: www.upmpaper.com

UPM Rauma

UPM Paper ENA Oy's Rauma mill is located by the sea on the west coast of Finland, near Rauma's city centre. Metsä Fibre Oy's pulp mill, Forchem Oy's tall oil distillation plant and Rauman Biovoima Oy's biofuel power plant are also based at the mill site. UPM Paper ENA Oy produces the raw and chemically treated water used at the site, and is responsible for the treatment of the site's industrial and municipal wastewaters. The companies collaborate closely in energy production, and Rauman Biovoima supplies the district heating power used by the city of Rauma. Rauman Biovoima's operations support the city's Hinku carbon neutrality project.

UPM-Kymmene Oyj changed its corporate structure in summer 2016. The Rauma mill, excluding Rauma Cell, is now part of UPM Paper ENA Oy, which is one of UPM-Kymmene Oyj's subsidiaries. Rauma Cell is still part of UPM-Kymmene Oyj.

The Rauma mill has three paper machine lines, a fluff pulp line, a twin-line debarking plant, two grinderies, two TMP plants, a surface water treatment plant, a biological effluent treatment plant and a landfill site for industrial waste.

The paper machines manufacture magazine papers — one of the machines produces uncoated, supercalendered (SC) paper, while the other two produce lightweight coated (LWC) paper. The paper made in Rauma is used in magazines, sales catalogues and advertising products. In addition to paper, the mill produces fluff pulp for the production of hygiene products and tabletop products.

Also located at the UPM Paper ENA Oy mill site is Rauman Biovoima Oy's biofuel power plant, which procures its operation, maintenance and environmental services mainly from UPM Paper ENA Oy. Approximately 90 % of the energy produced by Rauman Biovoima Oy is produced using renewable fuels. As the power plant is a separate company, its operations have only been included in this annual report with regard to vicarious liability.

Production capacity	960,000 tonnes of paper 150,000 tonnes of fluff pulp
Personnel	520
Products	Uncoated magazine paper: UPM Max, UPM Cat, UPM Smart, UPM Impresse, UPM Impresse plus Coated magazine paper: UPM Star, UPM Ultra, UPM Cote, UPM Valor, UPM Cote silk, UPM Ultra matt Fluff pulp
Certificates	EMAS – EU Eco-Management and Audit Scheme ISO 14001 – Environmental Management System Standard ISO 9001 – Quality Management System Standard OHSAS 18001 – Occupational Health and Safety System Standard PEFC™ Chain of Custody – Programme for the Endorsement of Forest Certification FSC® Chain-of-Custody – Forest Stewardship Council® ETJ+ Energy Efficiency System *The certificates can be found using the Certificate Finder tool at www.upm.com/responsibility*
Environmental labels	EU Ecolabel

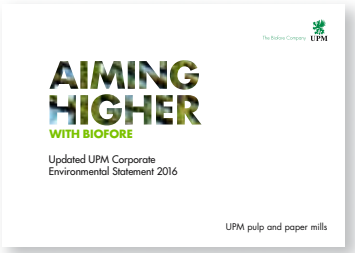
FSC
www.fsc.org
FSC® C014719
The mark of responsible forestry

For more information on FSC products, please visit www.fsc.org

EU Ecolabel
www.ecolabel.eu
EU Ecolabel : FI/011/001

PEFC
PEFC/02-31-80
Promoting Sustainable Forest Management
www.pefc.org

For more information on PEFC products, please visit www.pefc.org



This report on UPM Paper ENA Oy Rauma environmental performance in 2016 is the mill-specific supplement to the UPM Corporate Environmental Statement 2016 for UPM Paper ENA Oy Rauma paper machines and UPM-Kymmene Oyj Rauma Cell. It presents the mill's environmental performance and indicators in 2016. The UPM Corporate Environmental Statement together with the mill supplements comprise the global EMAS statement of the UPM Corporation. The Environmental Statement for UPM pulp and paper mills is available at www.upm.com. The next global EMAS Environmental Statement will be published in spring 2017.

Environmental year 2016

In 2016, further measures were taken to improve cost efficiency at the mill. The reduction of chemical pulp consumption at the paper machines increased the use of mechanical pulp, which increased the electricity consumption per tonne of paper produced. No investments were made at the mill in 2016 to improve the efficiency of the use of energy, but instead, efforts were made to develop processes to use energy more efficiently.

Measures to streamline the use of energy will still be implemented based on suggestions indicated in the energy audit. These measures are related to processes. There are no plans for investments to improve the efficiency of the use of energy.

In paper production, the target set for water consumption remained elusive. Specific water consumption levels increased slightly from those in 2015. Solids loss decreased slightly, but the overall target was not achieved. The specific emissions of the mill were in compliance with BAT levels in all areas.

The production of CTMP pulp was started in spring 2015 by altering the concept of the existing production line of mechanical pulp. The aim is to increase the volume further. In the CTMP process, more organic material ends up in the wastewater than in the production of regular mechanical pulp. This is reflected in an increase of the specific paper load.

Some changes occurred in the amount of chemicals stored at the mill site. The amount of liquid gas stored at the mill was reduced by a third and the use and storage of SO_2 was abandoned. The reporting specifications of the Finnish Safety and Chemicals Agency (Tukes) require an operational principle document to be maintained for chemical procedures. The Rauma mill is committed to maintaining the required level of safety. Chemical safety is based on UPM's internal chemical handling standard.

The company implemented a new system to promote preventive safety and record deviations. More preventive safety work was carried out in 2016 than in 2015. Two environmental deviations with minor environmental impact were recorded in 2016. These were due to overflowing of broke tanks in August and December caused by problems with the runnability of the paper machines and a small amount of the spillage ending up in a rainwater channel.

In 2016, noise prevention work mainly focused on preventive maintenance. Noise caused by the forest industry facilities is below permit limits.

Construction works continued at the Sampaanalanlahti field with the construction of the surface structure. Power plant ash is utilised in the works, improving the reuse percentage of factory waste.

Annual audits in accordance with the ISO 14001 Eco-Management Scheme and the ETJ+ energy efficiency system were conducted in 2016.

Review applications for the environmental permit for the mill, the port and the wastewater co-treatment plant were submitted for processing in 2015. The basis for the review is the requirement in section 80 (1) of the Finnish Environmental Protection Act to apply for the review of the environmental permit due to new BAT conclusions. The environmental permit must also be reviewed due to changes in operation. The processing of the review applications has not yet been completed. The application also included a baseline report on the mill area. In addition, standpipes were installed in the area and environmental measurements of the soil and water were made to evaluate contamination. On the basis of the survey, no restoration measures are necessary.

Continuous improvement while making operations more effective

The mill is constantly developing its processes and operations, providing personnel and partners with training and continuing to minimise risks to the environment. All figures indicate that the mill's operations comply with the Best Available Technology (BAT) criteria. The group-wide Clean Run campaign to avoid environmental deviations continued. Risk mapping documents and risk management plans are kept up to date.

Our operations are evaluated by the environmental authorities and independent external environmental specialists. The mill works in co-operation with various parties on a regional level.

We participate in drawing up regional environmental programmes, analysing the state of waters and planning programmes of measures in compliance with the Water Framework Directive. In particular, we want to take part in projects aimed at improving the state of the Rauma sea area and the Baltic Sea.

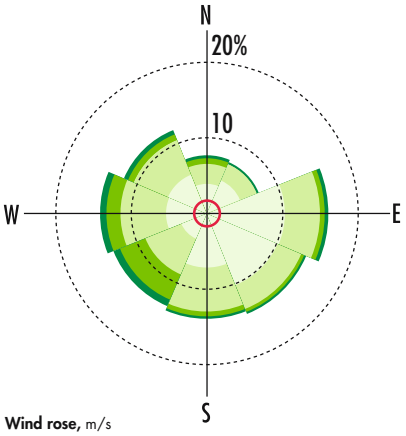
The EU Ecolabel has been awarded to all production at the paper mill. The label shows that a product has been manufactured in a way that saves energy and water, minimises the amount of waste, favours renewable natural resources and uses raw materials that are as environmentally friendly as possible. The EU Ecolabel is the only independent environmental label valid throughout Europe.

Timo Suutarla, General Manager

Eerik Ojala, Environment and Safety Manager

Air

Sulphur emissions decreased slightly compared to the previous year. There were no major changes in the amount of fuels containing sulphur. Nitrogen oxide emissions remained unchanged compared to previous years. Fossil CO_2 emissions have remained low and in fact decreased slightly compared to 2015. Only around 3 % of the total amount of fuels used were purely fossil fuels. Renewable fuels were the source of more than 80 % of all UPM Rauma CO_2 emissions.



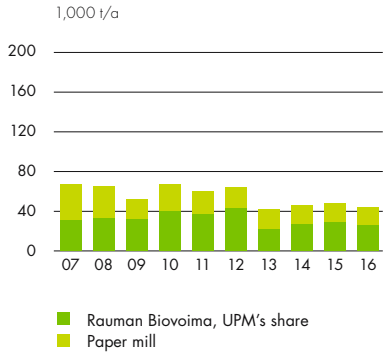
Wind rose, m/s

- Calm
- 0.5–2.9
- 3.0–4.9
- 5.0–6.9
- >7.0

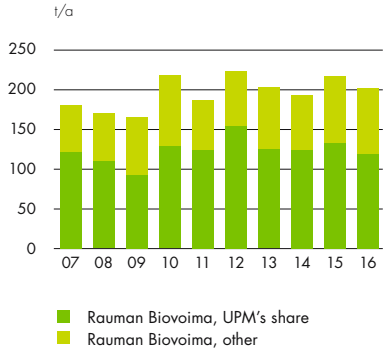
The wind rose shows the direction of the wind. Wind directions and speeds were measured in Sinisaari in Rauma in 2016. The measurement point is approximately 0.5 kilometres from the mill towards the city.

Source: Finnish Meteorological Institute, Monitoring air quality in Sinisaari, Rauma in 2016 (Ilmanlaadun seuranta Rauman Sinisaaressa 2016).

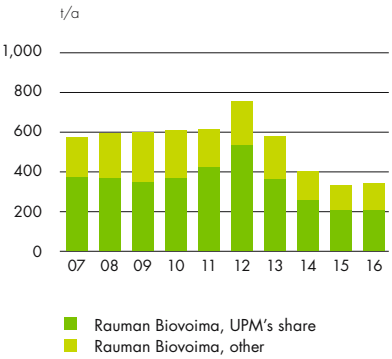
Fossil carbon dioxide, CO_2



Sulphur dioxide, SO_2



Nitrogen oxides, NO_x



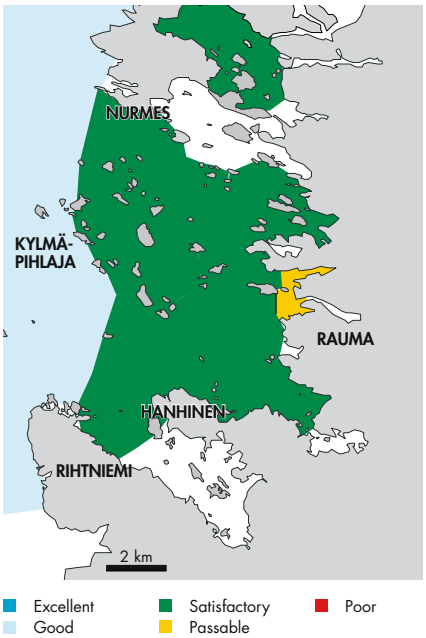
Noise

Previously agreed actions to reduce the noise emissions were completed and the noise distribution model was updated in 2013. Preventive noise reduction activities will be continued.

Water

An operational committee made up of representatives from UPM Paper ENA Oy, Metsä Fibre Oy and the city of Rauma is in charge of developing the co-treatment and monitoring its success. UPM Paper ENA Oy still has the responsibility for wastewater treatment.

Wastewater treatment results were good. Annual total emissions were in compliance with BAT levels. The wastewater effluent load from the forest industry and the joint treatment plant is now so low that the state of the sea water can no longer be significantly improved by making treatment more efficient.

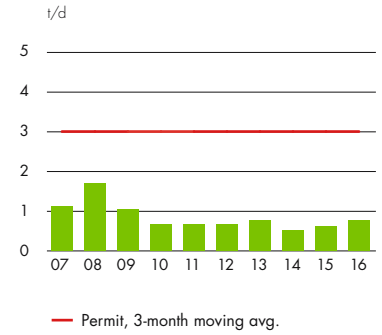


Source: Lounais-Suomen vesi- ja ympäristötutkimus Oy

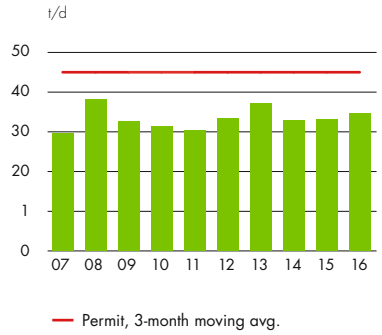
The general usability of the Rauma sea area in 2016.

The usability classification is a classification method used earlier by Finland's environmental administration. The classification is based on the phosphorus and chlorophyll content and the amount of E. coli bacteria in the production layer between June and September. The classification was determined based on the weakest quantity.

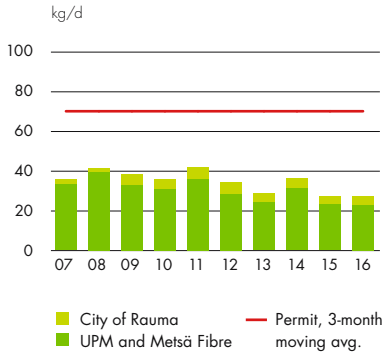
Biological oxygen demand, BOD_7



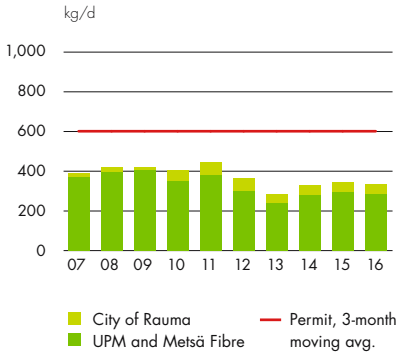
Chemical oxygen demand, COD_{cr}



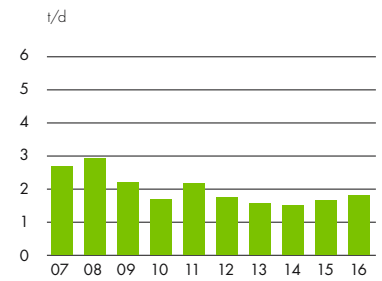
Phosphorus, P



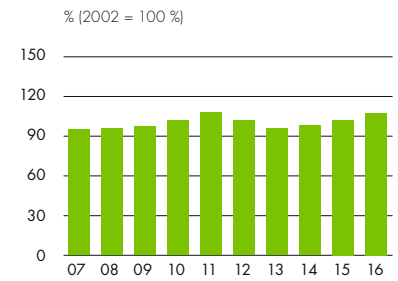
Nitrogen, N



Suspended solids into the sea

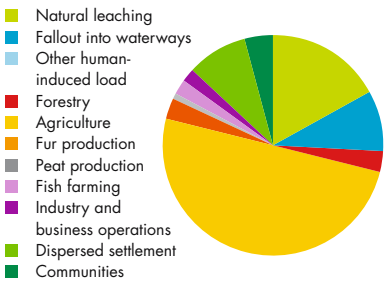


Process water consumption

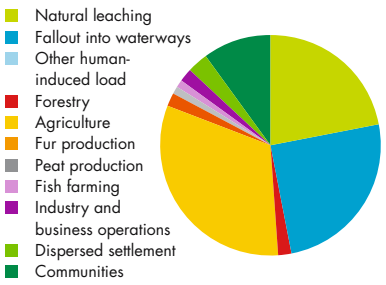


Emissions into waterways in the River Basin District of the Kokemäenjoki River – Archipelago Sea – Bothnian Sea

Phosphorus



Nitrogen



The ecological classification of bodies of surface water within the regional programme of area measures was good in the southern part of the Rauma coast and satisfactory further north. The share of the total nutrient load in surface water produced by industry and businesses was small, at less than 2 %, of which only about 10 % was useful to algae (causing eutrophication).

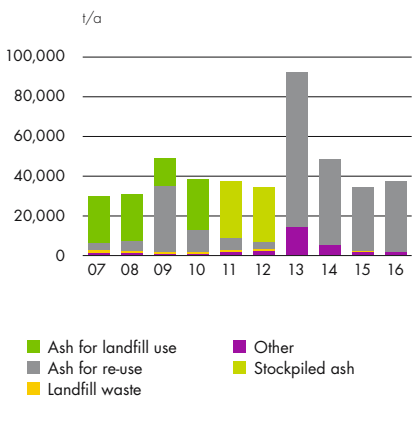
Source: West Finland Regional Environment Centre (Länsi-Suomen ympäristökeskus), River basin management plan for the River Basin District of River Kokemäenjoki – Archipelago Sea – Bothnian Sea until 2015 (Kokemäenjoen–Saaristomeren–Selkämeren vesienhoitoalueen vesienhoitosuunnitelma vuoteen 2015)

Waste

The majority of solid waste can be reused, with the exception of domestic and process waste. Ash is generated at the Rauman Biovoima power plant, but the paper mill organises the disposal of the ash in accordance with a mutual agreement. The landfill area complies with the latest environmental requirements. Different waste types are stored in dedicated areas, which makes it possible to reuse them in the future. In 2017, the aim is to continue using ash and other recycled materials from the forest industry in the surface structures of landfills and in the construction of storage areas. New ways of reusing materials in earthworks are also being looked into. Ash will be used to replace other construction materials. In 2017, the goal is to end the use of the landfill area and stop depositing waste to the landfill. This means that all generated waste is reused.

A total of 35,296 tonnes of power plant ash was reused in the construction works at the Sampaanalanlahti field. The ash was not stored temporarily and no ash was unloaded from temporary storage. A total of 43 tonnes of kaolin was reused. The amount of landfill waste remained very low. The 'Other' waste category consists of domestic waste, process waste, metal waste and hazardous waste. The waste amounts used in the figures have been calculated as dry weights. The landfill monitoring programme is being managed by the authorities.

By-products and waste



Environmental parameters 2016

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 RaumaCell	960,000 t 150,000 t
Raw materials	Pulp and chemicals	See UPM Corporate Environmental Statement for more information.
Energy	Biogenic and fossil fuels Purchased energy (UPM)	Biogenic 81 %, fossil 19 %. Please refer to the UPM Environmental Statement for information
Emissions into air	Particulates Sulphur dioxide, SO_2 Nitrogen oxides, NO_x Fossil, CO_2	2 t 118 t 215 t (205 t + NO_x 10 t from propane) 43,900 t
Water consumption	Process and cooling water	14,154,086 m^3
Emissions to water	Clean cooling water and rainwater in the area Process effluent Biological oxygen demand, BOD_7 Chemical oxygen demand, COD_{Cr} Solids Phosphorus, P Nitrogen, N	1,219,489 m^3 13,307,123 m^3 112 t 3,701 t 259 t 4 t 49 t
Waste	Waste to landfill* – Kaolin – Process waste (UPM) – Process waste (Rauman Biovoima) – Domestic waste (UPM) – Domestic waste (Rauman Biovoima)	 0 t 142 t 17 t 7 t 4 t
	To temporary storage to wait for reuse – Ash – Kaolin	 0 t 0 t
	Reused waste – Ash – Kaolin – Metal waste etc. (UPM) – Metal waste etc. (Rauman Biovoima) – Recycled fibre etc. – Wood waste – Soil (UPM) – Biowaste	 35,296 t 43 t 396 t 542 t 305 t 9 t 4 t 4 t
	Incineration – Energy waste	 1,253 t
	Hazardous waste – UPM – Rauman Biovoima	 47 t 0 t
Size of mill area		198 ha

** Waste amounts given as dry weights.*

Performance against targets in 2016

- No serious environmental non-conformances occurred.
- The solids loss target of the paper machines – less than 1.4 % – was not achieved.
- The water consumption target of the paper machines – less than 10.9 cubic metres per tonne – was not achieved.
- Electricity consumption per tonne of paper increased. This was due to the increase of the share of mechanical pulp in paper. Work to enable the mill to achieve its overall energy consumption goals continues.
- Ash reuse rate was over 70 %.

Environmental targets 2017

The most significant actions for improving safety and protecting the environment in 2017 will be:

- Preventing environmental non-conformances and achieving the Clean Run objectives
- Further reductions of water consumption and solids loss
  – Water consumption less than 10.9 cubic metres per tonne
  – Solids loss less than 1.4 % of production
- Improving energy efficiency
- Ash reuse rate over 70 %
- Stop depositing waste to landfills

EMAS
Verified environmental management
REG.NO. FI - 000058

Verification decision

Accredited verifier DNV GL Business Assurance Finland OY Ab (FI-V-0002) audited in 2016 the UPM Rauma Environmental Management System and the updated information in the UPM Rauma Environmental Performance in 2016 report, as well as the updates made to the UPM Corporate Environmental Statement 2015, insofar as the updated information concerns UPM Rauma. On the basis of this audit, it was stated on 28 April 2017 that the UPM Rauma Environmental Management System, the updated information in this Environmental Performance report and the updated information concerning UPM Rauma in the UPM Corporate Environmental Statement all comply with the requirements of the EU Eco-Management and Audit Scheme (EMAS) Regulation (EC) number 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.
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