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WE LEARN.



**UPM, KYMI**

ENVIRONMENTAL PERFORMANCE IN 2008

## UPM, Kymi

- **Production capacity**

840,000 tonnes of paper

540,000 tonnes of chemical pulp

- **Personnel**

830

- **Products**

Coated and uncoated fine papers

**UPM** Finesse

**UPM** Fine

**UPM** Prelaser

**UPM** Prepersonal

**UPM** Form

**UPM** Letter

**UPM** Office, Future, Yes, KymLux

**UPM** Digi Laser

**UPM** Digi Finesse

**UPM** Jetlabel



## UPM in Kuusankoski

UPM's Kymi production facilities, which comprise the Kymi paper and pulp mills, are located in Kuusankoski, Finland, along the Kymi-joki River. The mills form a modern integrated production site, whose core products are uncoated and coated fine paper.

The paper mill is divided into two production units. PM 8 and coating machine 3 make up a modern coated fine paper production line, whose products include high-quality printing paper reels. PM 9 produces uncoated fine paper on reels and in sheets for printing paper, forms and envelopes as well as for office paper used in copiers and printers.

The pulp mill has two production lines for fibre raw materials used in paper making. The UPM mill site also includes Kymin Voima Oy's power plant, Schaefer Kalk Finland Oy's PCC plant and Kemira's Finnish Chemicals chlorine oxide plant, all of which are directly linked to Kymi's production plants. In addition, Solvay Chemicals Finland Oy's production plant in Kuusankoski provides the peroxide used for bleaching pulp. None of these plants are included in this publication.



This publication, UPM, Kymi Environmental Performance in 2008, together with the joint Environmental Report 2008 of the UPM pulp and paper mills, form the mill's environmental statement. The Environmental Report of the UPM pulp and paper mills is available at [www.upm-kymmene.com](http://www.upm-kymmene.com). The Kymi mill's next environmental supplement will be published in the spring of 2010.

# Achievement of the environmental targets for 2008

The Kymi mill met all environmental permit conditions for both air and water emissions. Waste management met the conditions specified, and there were no significant environmental disturbances. Stakeholders submitted seven queries and feedback items in the course of the year. Customer queries were mostly about eco-labels, the origin of wood and carbon footprint.

The mill continued to work toward its key environmental targets. Positive environmental themes in 2008 were based on the start-up of the pulp mill's new recovery line. Active environmental training and instructions provided for external employees, as well as regular site visits, formed the foundation for minimising the environmental load during the investment project and demolition.

## Investing in the environment

Environmentally speaking, the most significant event was the start-up of the pulp mill's new chemical recovery plant in the summer. The plant replaces two outdated chemical recovery lines with one modern line. The new recovery plant makes it possible to reduce air emissions through the use of equipment based on the latest. The aim is to increase the amount of electricity from biofuels and improve the mill's energy self-sufficiency. New process solutions were implemented to pay special attention to managing the risk of random emissions.

The start-up of the plant went as expected, and no significant environmental load occurred during production trial runs. During the summer, odour emissions were reported to the authorities and announced in local newspapers and the radio. Demolition of the old recovery line began in the summer of 2008 and will continue until the end of 2009. At the start of the demolition, a minor amount of lime sludge ended up in the river, but the impact on the environment was mostly visual.

## Promoting sustainable development

The environmental effects of the integrated Kymi mill and the eco-industrial park created around it were studied as part of the Industrial Symbiosis System Boundaries (ISSB) project of the Finnish Environment Institute (SYKE) and Åbo Akademi University. The purpose of the study was to determine how and in what circumstances a local ecoindustrial park can promote global sustainable development. One of the conclusions from the results was that greenhouse gas emissions would increase by approximately 40 per cent if the plants in the park were not to collaborate on energy acquisition. The study was based on Kymi's environmental reports from 2005.

## Certificates

- Quality Management System ISO 9001
- Environmental Management System ISO 14001 and EMAS
- Occupational Health and Safety Management System OHSAS 18001
- Chain-of-Custody Standards PEFC COC and FSC COC
- European Union Eco-label



**The Independent Assurance for Responsible Forest Management**

SGS-COC 003280

The FSC Logo identifies products which contain wood from well managed forests (Forest Stewardship Council)

FSC Trademark © 1996 FSC A.C. (FSC-SECR-01.56)



PEFC/02-31-80

Promoting sustainable forest management (Programme for the Endorsement of Forest Certification schemes)

For more info: [www.pefc.org](http://www.pefc.org)



[www.eco-label.com](http://www.eco-label.com)



## Paper mill

The paper mill's load to water bodies remained unchanged from the previous year's level. Consequently, it can be stated that investments and improvements in practices have reduced the load permanently. Nevertheless, in accordance with the principle of continuous improvement, the mill will continue to work to decrease the load further.

Investments made to cut the paper mill's solids losses reduced the total amount of solids by five per cent. A new oil separation basin was completed in the cooling water canal, which will improve the mill's oil spill response capability.

The targets set for 2009 include decreasing water consumption as well as reducing the amount of solids per tonne of paper produced.

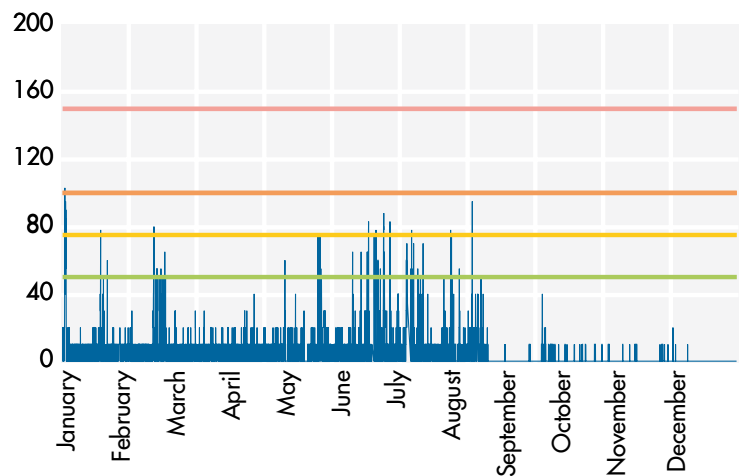
## Pulp mill

The pulp mill's environmental load remained at the same level as in previous years. With respect to air emissions, the load was divided into the emissions of the old and new recovery plant, so annual emissions figures include the combined load of the plants.

Work toward reducing water consumption per tonne of pulp produced continued. No dramatic change was achieved, however. For this reason, the key target for the next couple of years is to cut water consumption.

The focus in the pulp mill's environmental investments was on the construction of the new recovery line. Other significant environmental investments were projects related to abnormal situations and accidental emissions, including the construction of a sedimentation basin for sludge treatment and a sewer system in the yard areas to channel rainwater to the effluent treatment plant.

### AIR QUALITY INDEX, KUUSANKOSKI



Index	Description	Health effects	Other effects
0-50	Good	No observed	Minor environmental impacts in the long term
51-75	Satisfactory	Highly unlikely	Clear impacts on vegetation and materials in the long term
76-100	Passable	Unlikely	
101-150	Poor	Possible in sensitive individuals	
151<	Very poor	Possible in sensitive population groups	

# Air

The mill met all environmental permit limits for air emissions. The commissioning of the pulp mill's new chemical recovery plant made it possible to achieve a permanent reduction in emissions to the air. Substantial improvements were seen in particle, TRS, and sulphur dioxide emissions. In the latter part of the year, when the plant operated at a reduced production capacity, achieving full performance was challenging in some areas. The results were, however, encouraging.

According to continuous measurements performed outside the mill, the amount of odorous sulphur compounds has decreased since the start-up of the new recovery plant.

In the new system, malodorous gases can, in the event of disturbances, be directed straight to a backup system, eliminating any transient emissions. Naturally, this improves the attractiveness of the mill's surroundings.

The production plants are included in the emissions trading system, and an important environmental target is reducing fossil carbon dioxide emissions. The carbon footprint is calculated annually for each production line.

*\* Contains Kymi Voima Oy's emissions with regard to the energy consumed by Kymi.*

# Waste

The demolition of old mill buildings increased the amount of solid waste considerably. On the other hand, the amount of waste to landfill remained at the previous year's level. This was because demolition waste – both metals and crushed concrete and brick – could be reused. Significant uses for crushed concrete and brick included the construction of the new chemical recovery plant and construction in the Port of Hamina.

## Demand for ash

Co-operation for the reuse of ash expanded to cover all ash generated. The most important uses were road and field construction. Ash was also delivered for granulation, after which it was applied as a fertilizer to forests owned by UPM. The idea is to recycle nutrients brought to the mill in the wood back into the forest. Ash is also needed at the mill's landfill for reinforcing landfill structures.

*\*\* Contains the part of Kymi Voima Oy's ash corresponding to the energy used by Kymi.*

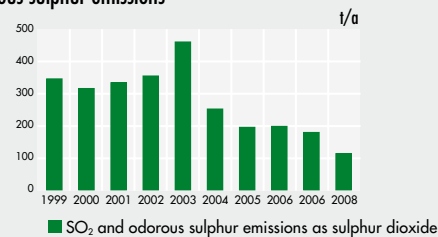
# Water

The effluent load remained at the previous year's level. Phosphorus emissions were reduced slightly, however.

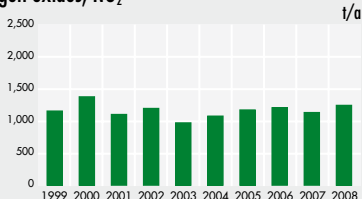
The aim of the EU Water Framework Directive is to prevent the status of surface water and groundwater from deteriorating and to achieve a good status for waters by 2015. According to a draft programme associated with this directive, no special measures are expected from the Kymi production plants. The targets set can be reached by reaching the emission values specified in the permit conditions and complying with the principle of continuous improvement.

## EMISSIONS INTO THE AIR

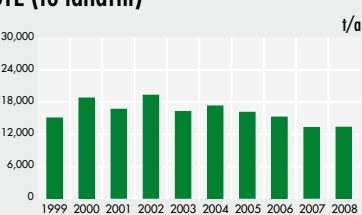
### Gaseous sulphur emissions\*



### Nitrogen oxides, NO<sub>2</sub>\*



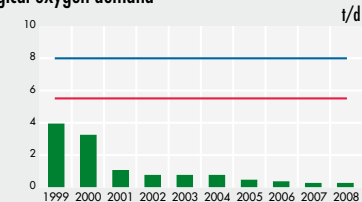
### WASTE (to landfill)\*\*



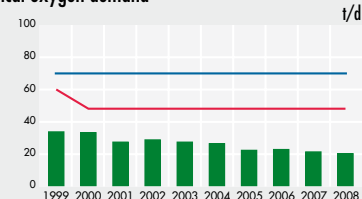
## EFFLUENT LOAD

— Permit limit, monthly average  
— Permit limit, annual average

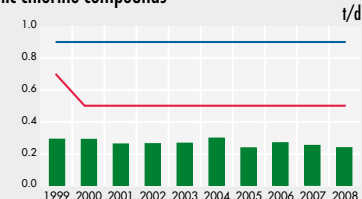
### Biological oxygen demand



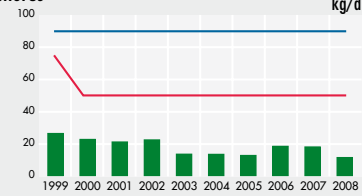
### Chemical oxygen demand



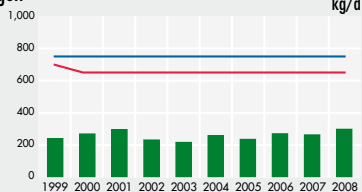
### Organic chlorine compounds



### Phosphorus



### Nitrogen



# Material balance in 2008

## Raw materials

wood	2,188,443 m <sup>3</sup>
purchase pulp	0 t
chemicals	365,813 t

**Electricity** 318,122 MWh

## Fuels

biogenic	85%
fossil*	15%

\* Contains natural gas used for drying in the paper machine

## Emissions into air

sulphur SO <sub>2</sub>	113 t*
nitrogen oxides (NO <sub>2</sub> )	1,247 t
carbon dioxide fos	100,629 t**
particulates	60 t

\* SO<sub>2</sub> and odorous sulphur emissions as sulphur dioxide

\*\* Reduced amount bound to PCC



## Sold products

paper	738,283 t
pulp	2,066 t
turpentine	268 t
tall oil	10,818 t
heat	20,500 MWh
electricity	14,900 MWh
biofuel	219,600 MWh

## Waste (dry weight)

### Reused

ash	6,085 t
metal	9,454 t
waste paper and board	1,199 t
combustible waste	578 t
crushed concrete	13,527 t
other	1,141 t

### To landfills

ash	5,084 t
soda residue	7,015 t
process waste	1,118 t
domestic waste	68 t

## Emission to water

effluent	37,836,348 m <sup>3</sup>
COD <sub>Cr</sub>	7,305 t
BOD <sub>7</sub>	82 t
AOX	87 t
phosphorus	4.1 t
nitrogen	108 t
cooling water	40,500,000 m <sup>3</sup>

Cooling water is used in process sites in which the water is not contaminated. After use, the clean cooling water is returned to the Kymi River at an elevated temperature. The statement also includes Kymin Voima Oy's emissions with regard to the energy consumed by Kymi.



# Key environmental aspects and targets

Key environmental factor	Targets related to this factor
<b>1. Raw materials consumption</b> Use of renewable wood raw materials, chemicals, pigments, and fillers, as well as water.	Use of wood raw materials that is based on sustainable forest management. The target is implemented through the forestry department's targets. Reduction in the use of environmentally hazardous chemicals. The target is to reduce the use of environmentally hazardous chemicals through the approval and procurement procedure associated with the new chemical database.
<b>2. Energy consumption</b> Fuel consumption, purchase electricity consumption.	Energy conservation and effective use of biofuels. The target is to remain within the limits for energy consumption specified in the BAT Reference Document drawn up on the basis of the EU IPPC Directive. Energy consumption will be reduced in accordance with Kymi's Energy Saving Programme, related to UPM's Energy Saving Campaign. The effective use of biofuels will be implemented through Kymin Voima's targets.
<b>3. Effluent load</b> Organic matter dissolved in effluent (measured through COD <sub>cr</sub> and BOD <sub>7</sub> analyses), nutrients (nitrogen and phosphorus). Trace amounts of hazardous substances.	Target: To keep emissions of oxygenconsuming organic materials (COD), nitrogen, phosphorus, and organic halogens (AOX) into water within the limits specified in the BAT Reference Document drawn up on the basis of the EU IPPC Directive. Reduction of water consumption in pulp production to 40 m <sup>3</sup> /t pulp and in fine paper production to 8 m <sup>3</sup> /t paper by 2011. Reducing solids to below one per cent.
<b>4. Air emissions load</b> Emissions from mill energy production and purchase electricity production, nitrogen oxides, sulphur dioxide, carbon dioxide from fossil fuel use, odorous sulphur compounds.	Reduction of odour problems in the mill surroundings. The target is to reduce concentrations measured at the odour measurement point so that there are no hourly average values of odorous sulphur compounds over five micrograms per cubic metre by 2011. The pulp mill's NO <sub>x</sub> emissions will be reduced such that in 2011, the emissions will be 1.7 kg per tonne of pulp produced.
<b>5. Waste</b> The majority of the waste: ash, which requires space for final disposal. Organic waste's emission of methane at landfills.	Improving the efficiency of sorting and reducing the amount of waste for final disposal. The target is to reduce the amount of waste to landfill by 20 per cent from the 2007 level by 2011.
<b>6. Logistics</b> Raw material and product transport based on fossil fuel use; carbon dioxide, sulphur dioxide, and nitrogen oxide emissions; dust and noise pollution.	Implementation of the target through UPM's logistics department targets as related to product transport. The local target is to transport 75 per cent of Kymi products by rail by 2010.

## Kymi's environmental targets and achievements in 2008

Reduction in water consumption m <sup>3</sup> /t			
	2007	2008 target	2008 achieved
Pulp mill	54.2	50	56.5
Reduction in solids losses %			
Paper mill	1.4	1.2	1.3

The achievement of other targets is explained on pages 4 and 5.

## Kymi's environmental targets for 2009

### Reduction in water consumption

Pulp mill 50 m<sup>3</sup>/t, Paper mill 9 m<sup>3</sup>/t

### Reduction in solids losses

Paper mill 1.20%

### Reducing the amount of waste for final disposal

Training and improving waste sorting

### Meeting the obligations of the new environmental permit

### Reducing energy consumption

UPM's Energy Saving Campaign 2009–2010



**EMAS**

**Validated  
information**

REG.NO. FI-000023

Accredited verifier Inspecta Sertifointi Oy (FI-V-0001) has audited the joint Environmental Report of UPM's paper and pulp mills for 2008, the Environmental Management System of the UPM Kymmene Corporation Kymi mill and the updated information for the 2006 EMAS Statement in 2008. On the basis of this audit, it has been stated on 9 June 2009 that the Environmental Management System and the updated information of the EMAS Statement comply with the requirements of the EU's EMAS Regulation (EEC) No. 761/2001.

**For further information, please contact:**

**[info.kymi@upm-kymmene.com](mailto:info.kymi@upm-kymmene.com)**

**Ismo Taskinen**

Environmental Manager

Tel. +358 2041 53662

[ismo.taskinen@upm-kymmene.com](mailto:ismo.taskinen@upm-kymmene.com)

**Irma Niemi**

Communications Manager

Tel. +358 2041 52173

[irma.niemi@upm-kymmene.com](mailto:irma.niemi@upm-kymmene.com)



UPM-Kymmene Corporation  
Kymi

FI-45700 Kuusankoski  
Tel. +358 2041 5121

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