WE LEAD.
WE LEARN.

UPM

UPM, Tervasaari
Environmental Performance in 2006

UPM, Tervasaari

Production capacity
- 460,000 tonnes of paper
- 240,000 tonnes of chemical pulp

Personnel
- approximately 800

Products
- Label papers (Base):
  UPM Blue
  UPM Brilliant
  UPM Brilliant pro
  UPM Honey
  UPM Golden
  UPM Pasific
  UPM SCK
- Envelope and MG papers
  UPM Natura
  UPM Formula
  UPM Strong
  UPM Cream
  UPM Golden
  UPM Shine (MG)
  UPM Swanshine (MG)
- Sack Papers:
  UPM WEX LD
  UPM WEX LDF
  UPM WEX SP
  UPM WEX
  UPM Prime

Certificates
- Quality Management System
  ISO 9001:2000
- Environmental Management System
  ISO 14001:2004
- EMAS Eco Management and Audit Scheme
- Chain-of-Custody Standard
  PEFC COC:2004

UPM, Tervasaari

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

The Tervasaari mill has two pulp mills, a twin-line debarking plant, a power plant, four paper machines, a water power plant and a biological effluent treatment plant. At the sulphate pulp mill, unbleached long-fibre pulp for the paper machine producing sack and packaging papers is the main product. It is also used to produce short-fibre unbleached pulp for the paper machine producing mainly envelope paper. Last year a significant portion of the short-fibre pulp was bleached, together with SAP pulp, using the bleaching line using oxygen and peroxide. This mixed pulp is used for the manufacture of base papers for self-adhesive labels as well as packaging papers.

The heat needed for the mill is produced by the mill's own power plant, and approximately half of the electricity needed is produced at the mill. A small amount of the heat is sold to external users as district heating and steam.

Tervasaari mill has its own landfill for industrial waste. This landfill is also used by a couple of other factories located at Valkeakoski. The use of the landfill will end in 2007, and measures for closing it down already began in 2006, as did the construction work for a new landfill.

In 2006, it was decided that the paper machine PK6 producing sack paper and the SAP pulp line would be closed during the third quarter of 2007. A new, larger bleaching line will be built for the washing, sorting and bleaching of sulphate pulp. This way, the self-sufficiency of pulp for the paper machines will still remain high.

The most significant investment of 2006 was made in paper machine PK8. The TARMO project comprised of renewing the press and dryer sections as well as the automation and electric systems of the machine. This project increased the capacity of PK8 from 130,000 tonnes to 175,000 tonnes per year. This investment, of EUR 60 million, is one of the largest recent UPM investments. To control waste water loading, ultra filtering equipment was already acquired beforehand, effectively reducing both the amount of waste water and the waste water load.

This Publication, UPM, Tervasaari, Environmental Performance in 2006, together with the joint Environmental Report 2006 of the UPM pulp and paper mills form the mills' environmental statement. The Environmental Report of the UPM pulp and paper mills is available at www.upm-kymmene.com. The Tervasaari mill's next environmental supplement will be published in the spring of 2008.

Environmental objectives and achievements in 2006

In 2006, significant, far-reaching decisions were made regarding the future of the Tervasaari mill. The decision to close paper machine 6 and to end the production of SAP pulp during 2007 also means a considerable reduction in the amount of personnel. The decision to build a bleaching line for sulphate pulp and to increase production, on the other hand, creates new hope for the future of Tervasaari.

The sulphate pulp bleaching tests carried out during 2006 were naturally a tough test for the biological effluent treatment plant, but thanks to careful monitoring, the permit conditions were well met. The effluent treatment plant will be easier to manage as the new bleaching line has been taken into use and when it reaches steady production conditions. It is hoped that the new environmental permit that is currently being processed by the authorities will allow higher emission limits than at present, especially with regard to the chemical oxygen demand caused by the effluents in the watercourses. The current limit, 10 t/d as a monthly average, is very tight in comparison with several other plants and might make it difficult to fully utilise the pulp production capacity. Maximal own pulp production is, however, crucial to the profitability of the remaining three paper machines, as well as to the future and continuity of the Tervasaari mill.

The electric filter of the lime kiln that was taken into use at the beginning of this year is working very well, and particle emissions are clearly lower than before. The particle emissions of the soda recovery boiler, however, are very close to the current permit conditions. It is very likely that the emission limits of the pending environmental permit will be significantly tighter than the current ones. This, in turn, will require a very expensive investment in electric filters in the near future.

No recovered fuel has been burned in the solid fuel boiler since the end of 2005 as the combustion technology of the boiler does not meet the combustion conditions required in the waste incineration directive. Surveys relating to what measures are needed in order to restart the use of recovered fuel are in progress.

The measures to close the UPM Kalattomanlahti landfill and build the new Suikki landfill were started in 2006 immediately after receiving the appropriate permits. Approximately 4 hectares of the current landfill will be closed by September 2007. The final closing will take place during the following five years. According to the permit conditions, the landfill will no longer be used after November 1, 2007. The Suikki landfill will be taken into use by October 2007. Its estimated lifespan is approximately 40 years.

The most important environmental actions in the following years will be focused on controlling emissions into the air, decreasing the amount of waste placed in landfills, as well as improving landfill activities. After the restructuring, the possibility to decrease noise nuisance will also be studied.

Lauri Tusa
Environmental Manager

Juhani Alajoutsijärvi
Development Manager

Air

The most relevant change in air protection during 2006 was the implementation of the electrostatic presipitator for the lime kiln. During the installation of the filter, more lime than normal had to be placed in the landfill, which was reflected in the amount of waste placed in landfills.

The permit conditions did not change during 2006. The required emission measurements carried out by an outside expert every three years were carried out at the end of the year.

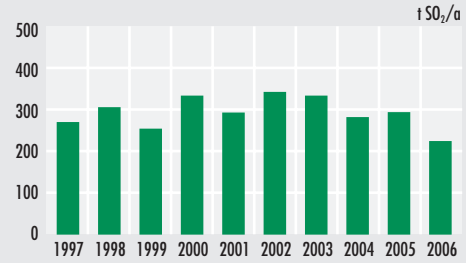
The monitoring of the quality of city air continued, like previous years, in co-operation with the town of Valkeakoski and some other industrial plants in the Valkeakoski area. The summary report for 2006 was not available at the time of the writing of this report. The monthly reports show that the daily recommended limit for TRS, 10 µg/m³, was exceeded in the health centre measurement point three times in March, five times in May and once in August, and once in March in the Sorrila measurement point. None of these were clearly due to the emissions from Tervasaari.

The environmental target was that the short-term hourly TRS content due to emissions from Tervasaari should not exceed the value of 10 µg/m³, no more than five times per month at a wind speed of more than 1 m/s. This target was not met at the health centre measurement point in March, July, August and September or at the Sorrila measurement point in March, September and October.

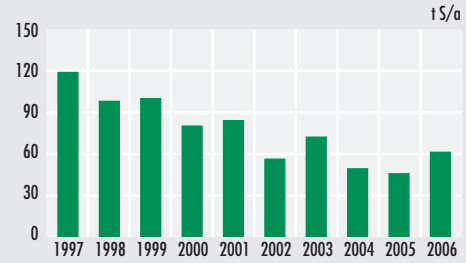
During 2006, 12 cases of feedback from inhabitants regarding odour nuisance were recorded regarding nine nuisance instances. The emissions into the air caused another three feedback contacts regarding cars being soiled by soda drops and sawdust.

EMISSIONS INTO THE AIR

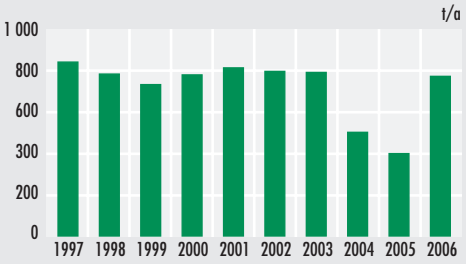
Sulphur dioxide, SO_2



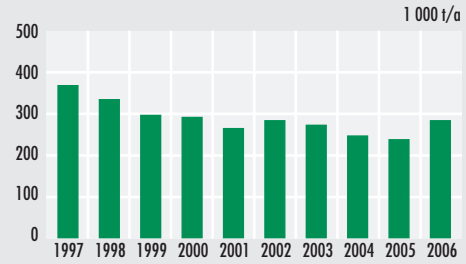
Malodorous sulphur compounds, TRS



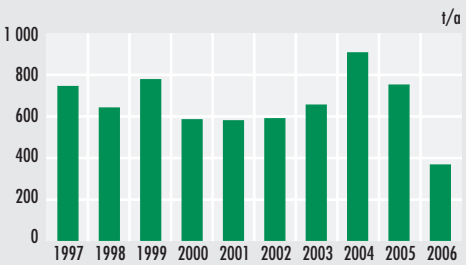
Nitrogen oxides, NO_x



Fossil carbon dioxide, CO_2



Particulates



Waste and waste management

The amount of solid waste placed in the landfill increased markedly from the previous year as the soil removed during the construction of an industrial road at the mill facility was placed in the landfill according to the instructions of the Environmental Centre and therefore, was also recorded as waste.

An exceptional amount of lime mud had to be placed in the landfill during the installation of the electric filter. In addition, the construction of the new bleaching line caused more construction waste and soil to be placed in the landfill than normally.

664 tonnes of fly ash from the solid Tervasaari's fuel boiler was used to stabilise the Säteri Oy landfill as its own power plant did not produce enough ash for this purpose.

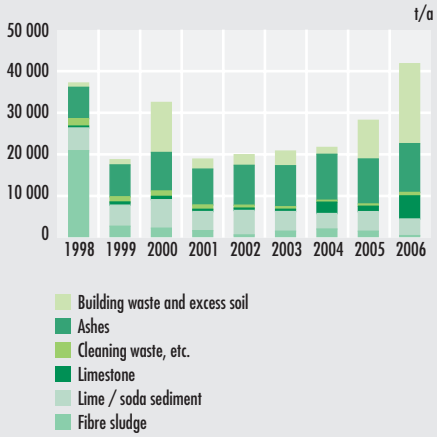
A total of 158 tonnes of hazardous waste was forwarded to Ekokemi.

The closing of the Kalattomanlahti landfill began in the autumn of 2006 by shaping the surface area for closing and depositing contaminated soil to be used for the closing in the areas at the side of the landfill. The area to be closed in the first phase is approximately four hectares, and this part of the work will be completed in September 2007. The rest of the actual deposit area, approximately seven hectares, will be closed at a later time during the following five years. A lot of time is required as a great amount of soil is needed for closing the landfill and such soil is not always available.

The connection road to the new Suikki landfill was completed during the autumn. The actual base levelling was started at the end of the year after the surface soil had been removed. The construction of a sewer from the landfill to the Tervasaari biological effluent treatment plant was already started in 2006 and is expected to be completed at the beginning of the summer of 2007.

After October 2007, only a sedimentation basin for liquid waste will remain at the Kalattomanlahti landfill area. From there, liquid will be pumped to the Tervasaari treatment plant and the sediment will be deposited at the new landfill. The target of solid waste to be placed in landfills, 7,000 tonnes excluding soil and ash, was exceeded by 400 tonnes.

Solid waste placed into the landfill

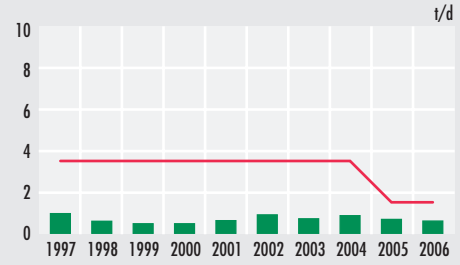


Noise

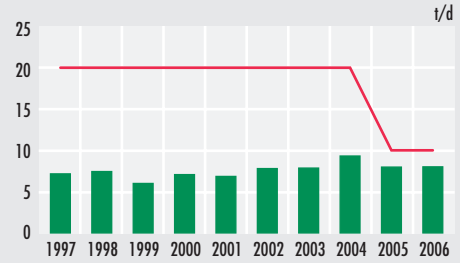
The Tervasaari noise study was updated in the summer of 2006. The purpose was to study the effect of the future changes in production, ending the production of SAP pulp and stopping paper machine PK 6. Noise nuisance towards the North will decrease a little.

EFFLUENT LOAD

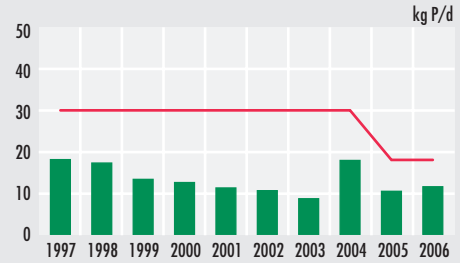
BOD_7



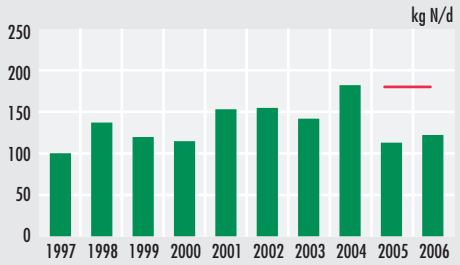
COD_{Cr}



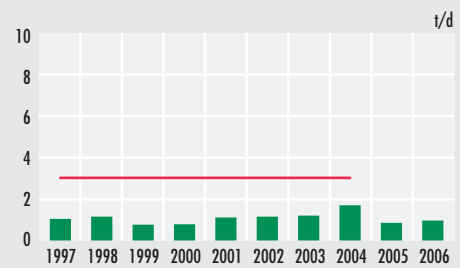
Phosphorus



Nitrogen



Solids



— Permission, monthly average

Water

Regarding the waste water from Tervasaari, the aim has been to keep the volume of water directed to the effluent treatment plant below 30,000 m^3/d, as well as keeping the amount of chemical oxygen demand (COD) of water directed to the watercourses to under 10 t/d for each day and to under 9 t/d as the monthly average.

The monthly volume of waste water did not exceed the aforementioned value even once. The daily level, on the other hand, was exceeded more than 40 times. Part of these excessive values were due to the test runs of the new bleaching line. Actions to decrease the amount of waste water from processes have been very successful and will continue in the future.

A small portion of the COD load to watercourses is created through two clean water sewers. This is naturally taken into account when calculating the load caused by the mill. The COD load exceeded the target daily value on 44 occasions. In September, the monthly average was 9.9 t/d, very close to the original permit limit of 10 t/d.

For the rest of the year, waste water emissions met the permit conditions. The most critical condition is the COD permit limit of 10 t/d. A higher emission limit was applied from the Western Finland Environmental Permit Authority in 2005. The new permit limit was 11 t/d from 1 September, 2005, through 31 December, 2006. The Vaasa Administrative Court rejected the appeal made against this decision. The appealer did not accept this decision and made a new petition to the Supreme Administrative Court in January 2007.

Meeting the limits for biological oxygen demand of waste water or the limits for nutrients, nitrogen and phosphorous did not cause any problems.

The operational security of the effluent treatment plant was increased by repairing the belt press of the sludge handling. It is now used as a back-up for the screw press that is usually used. The transfer of dried sludge for burning at the power plant is operating very well. Only 216 tonnes of the dried sludge was placed in the landfill.

As in previous years, the aeration of Viidennumero Strait continued during the winter when the strait was covered with ice. Aeration prevents the flow of waste water above the bottom towards the middle of the Vanaja lake located approximately 10 km below the mill in the watercourse. According to the permit conditions, this has so far been considered necessary although the waste water load from Valkeakoski's direction is currently only a fraction of what it used to be when aeration was started in mid-1970's.

Environmental targets for 2007

Target
Daily COD emissions to the watercourse
– every day less than 10 t/d
– monthly average less than 9 t/d
Reduction in the volume of pigment waste taken to landfill.
– in 2007, 500 t
Incineration of malodorous gases
– use of the back-up system only two times per month

Material balance in 2006

Wood raw material

pine pulpwood	163 000	solid m^3
pine wood chip	413 520	solid m^3
spruce wood chip	208 400	solid m^3
sawdust	368 300	solid m^3

Purchased chemical pulp

pine ECF	103 600	t
birch ECF	99 100	t
other	2 700	t

Chemicals

pigments	7 550	t
starches	6 890	t
glues/polymers	6 020	t
lye	7 700	t
lime	3 700	t
hydrogen peroxide	3 050	t
other	14 410	t

Water

process and cooling water	32 706 000	m^3

Energy / purchased fuels

biogenic	53	%
fossil	47	%

Emissions into air

malodorous sulphur (TRS) as sulphur	61 t
particulates	364 t
sulphur dioxide SO_2	220 t
nitrogen oxides	773 t
fossil CO_2	282 500 t

Discharges to water

clean cooling water	23 264 400 m^3
process waste water	9 442 000 m^3
biological oxygen demand, BOD_7	215 t
chemical oxygen demand, COD_{cr}	2 920 t
solids	330 t
phosphorous, P	4,2 t
nitrogen, N	44,2 t

Products sold

paper	426 830 t
soft soap	12 000 t
raw turpentine	150 t
district heating	91 GWh

Waste to landfill

ash	11 800 t
green lye dregs / lime	9 620 t
fibre sludge	216 t
soil and stones	18 950 t
demolition waste	315 t
other	1 190 t
Hazardous waste	158 t
Recycled	
metal waste, etc.	600 t
fly ash	820 t
energy waste	660 t

EMAS

Validated information

REG.NO. FI-000048

As the accredited verifier, Inspecta Sertifiointi Oy (FIN-V-001) has audited the joint Environmental Report 2006 of the UPM pulp and paper mills as well as the environmental management system of UPM's Tervasaari mill and the EMAS information for the year 2006. Based on the audit, it was stated on 28 May 2007 that the environmental management system and the EMAS Statement are in compliance with the requirements of the EU and the EMAS Regulation (EEC) No. 761/2001.

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