

ENVIRONMENTAL performance in 2015



UPM Fray Bentos



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

UPM Fray Bentos

The pulp mill is located on the coast of the river Uruguay, 5 km away from the city of Fray Bentos.

Construction of this state-of-the-art pulp mill began in 2005 and the total investment was of 1.2 billion US dollars. The Environmental Authorization for Operation was granted by authorities on November 8th, 2007. The environmental authority in Uruguay is the Ministry of Housing, Territorial Planning and Environment (MVOTMA) through the National Direction for the Environment (DINAMA). Through the use of modern techniques high quality pulp is efficiently produced, most of it for the Asian and European markets.

The annual capacity of the mill is of 1.3 million tons of bleached eucalyptus pulp, and the mill uses approximately 4.5 million cubic metres of wood. Wood procurement is under the responsibility of UPM Forestal Oriental, which has been pioneering the development of eucalyptus plantations in Uruguay for over 25 years, since 1990. UPM has a 91% ownership in the Fray Bentos pulp mill and 100% in UPM Forestal Oriental. The UPM mill complex also accommodates the operations of four chemical plants that supply the bleaching chemicals for the process. These plants are under the responsibility of Kemira, which operates three of them (hydrogen peroxide, sodium chlorate, chlorine dioxide) while the fourth (oxygen) is operated by Praxair.

Maintenance of pulp mill operations is outsourced to Andritz, which supplied most of the production equipment for the construction of the mill.

Production capacity	1,300,000 ADt
Personnel	180
Products	UPM Euca (bleached eucalyptus kraft pulp)
By-products	Electricity
Certificates	EMAS – EU Eco-Management and Audit Scheme ISO 14001 – Environmental Management System Standard ISO 9001 – Quality Management System Standard ISO 50001 – Energy Management System Standard ISO 22000 – Food Safety 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®
	<i>All certificates can be found from UPM's Certificate Finder (available at www.upm.com/responsibility).</i>
Environmental labels	UPM pulp products have the approval for use in EU Ecolabel and Nordic Ecolabel paper products.



UPM Fray Bentos Environmental Performance in 2015 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 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.



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Environmental year 2015

Performance

The Fray Bentos pulp mill continued to achieve in 2015 a high level of capacity utilization, maintaining its reliability in pulp quality as well as a high level of environmental performance.

Three events with permit non-compliances occurred during the year. During the first quarter of the year, the discharge temperature of the effluent exceeded the limit of 37°C for several hours, due to a combination of high wet bulb temperatures and loss of efficiency in the raw effluent cooling towers. By the middle of the year, the filling of those towers was replaced, and also new cooling towers were installed for final effluent, in order to comply with a new permit limit of 30°C.

In August 2015 the recovery boiler was stopped for preventive maintenance, and the mill was stopped for five days. During this period the biological effluent treatment was disturbed and for two days the phosphorus concentration in the final effluent exceeded the daily permit limit of 5 mg/L (5,08 and 5,88 mg/L). The monthly effluent discharge was 75 kg/d, exceeding the permit limit of 74 kg/d.

The third permit non-compliance occurred on November 24, when the daily discharge of phosphorus was 5,6 mg/L, over the limit of 5 mg/L; this disturbance was related to the startup of the effluent treatment plant after the annual maintenance shutdown of the mill.

None of the non-compliant discharges posed any potential risk of damage to the environment and corrective actions were implemented at the mill in agreement with the authorities.

Emissions into the air remained at good levels. NO_x emissions from the lime kiln were over the permit limit during an unusual amount of hours in the first four months of the year (21% of the time), but considering the uncertainty in the continuous NO_x measurement, it was within the tolerance of the environmental authoriza-

tion. These unusual levels of NO_x were related to tests performed in order to implement a new high level control strategy for the lime kiln.

Handling of malodorous gases was at very good level in 2015, in accordance with internal targets.

At the mill's landfill it was necessary to dispose of excess biosludge from the biological effluent treatment to avoid excessive build-up in the aeration basins. The second stage of the landfill was constructed and started operation in the final quarter of the year. Green liquor dregs represented approximately 69% of the total dry weight of solid waste disposed at the landfill site.

UPM Fray Bentos pulp mill is self-sufficient in electrical consumption through the energy generated by burning black liquor. About 11% of this biomass-based electricity generated at the mill in 2015 was supplied to the national grid.

The mill's emissions are within the ranges associated to Best Available Techniques (BAT) as established in the European Commission Implementing Decision of 26 September 2014.

Environmental monitoring

Environmental monitoring activities under the responsibility of UPM Fray Bentos and implemented by several external experts continue to show, eight years after the startup, that there is no negative impact

on the environment related to the operation of the pulp mill.

Updated results of the environmental monitoring activities are available in our website: www.upm.com.uy.

Transparency

The mill participated in 2015 in the session of the follow-up commission, which includes community and national stakeholders and was established in March 2007. Material presented by the company and by the authorities in these meetings is available in DINAMA's webpage. (<http://www.mvotma.gub.uy/comision-de-seguimiento-upm.html>)

The results of monitoring activities carried out separately by the Uruguayan authorities, who also perform monthly inspections at the mill, confirm the ones obtained in the mill's monitoring program. Those results are periodically presented to the follow-up commission in Fray Bentos. Additional information on compliance with legal requirements can be found both in UPM's and DINAMA's webpages.

The environmental product declaration for Fray Bentos pulp was updated and made available to customers.

The mill has arranged a system of weekly visits to the site which is open to the general public free of charge. Since 2008, over 25.000 people from Uruguay and several other countries has visited our facilities.



Juha Kääriäinen,
Vice President, UPM Uruguay Operations



Gervasio Gonzalez,
Environmental Manager

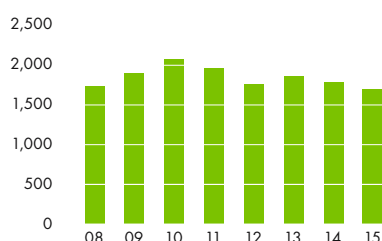
Air

Emissions into the air remained at very good levels, with all parameters within the conditions of the environmental permit.

Considering the uncertainty in the continuous NO_x measurement for the lime kiln, its NO_x emissions were above the permit limit during an unusual amount of hours during the first four months of the year (21% of the time), but the annual exceedance was within the tolerance of the environmental authorization. These unusual levels of NO_x were related to tests performed in order to implement a new high level control strategy for the lime kiln. After the control system was implemented, NO_x emissions from the lime kiln returned to normal levels.

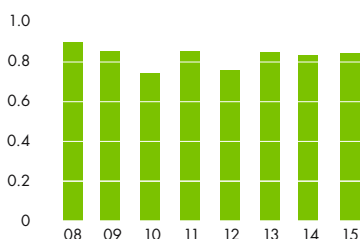
NITROGEN OXIDES, NO_x

t/a (measured as NO₂)

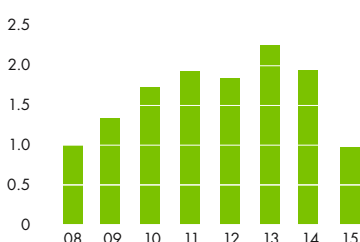


EVOLUTION OF FUEL OIL CONSUMPTION

(tons, relative to 2007)

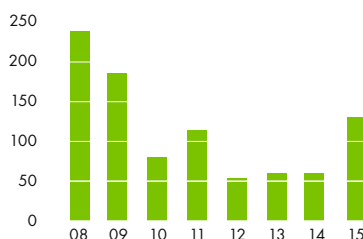


EVOLUTION OF ELECTRICITY SUPPLIED TO THE NATIONAL GRID
(GWh, relative to 2007)



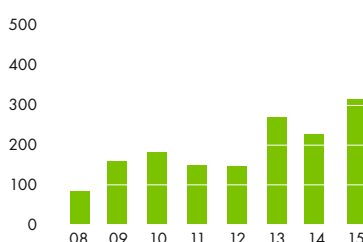
SULPHUR DIOXIDE, SO₂

t/a



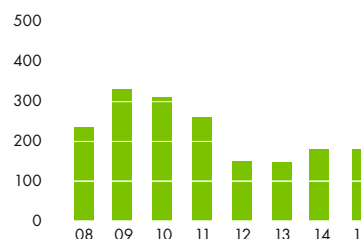
DUST

t/a



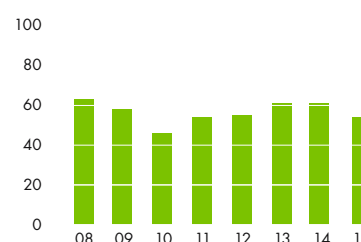
BIOLOGICAL OXYGEN DEMAND, BOD₅

t/a



NITROGEN (INORGANIC), N

t/a



Handling of malodorous gases was at good level in 2015, and in accordance with internal targets. There were 6 odour events reported in nearby areas that were related to disturbances in the operation of the mill, including the annual shutdown. In general, these complaints corresponded to short duration events (15 to 30 minutes or less) of mild intensity. Odours originated at the pulp mill do not pose any potential risk of harm to the environment or human health.

The mill continues to communicate in advance to the community, local press, national stakeholders and members of the follow-up commission when there will be a planned activity that might cause the emission of odorous compounds to the air, as well as answering openly all related questions from stakeholders.

Ambient air quality measurements show that the operation of the pulp mill has no significant effect on the concentrations of pollutants in the air. Concentrations of all measured parameters have remained within the limits established in the environmental permit.

Water

UPM Fray Bentos acquires raw water from the Uruguay river. The operations required about 0.90 m³ of water per second and generated about 0.69 m³ per second of treated effluent.

During the first quarter of the year, the discharge temperature of the effluent exceeded the limit of 37°C for several hours, due to a combination of high wet bulb temperatures in the air and loss of efficiency in the raw effluent cooling towers. By the middle of the year, the filling of those towers was replaced. New cooling towers were installed for the final effluent, in order to comply with a new permit limit of 30°C imposed by the Uruguayan authorities.

In August 2015 the recovery boiler was stopped for preventive maintenance, and the mill was stopped for five days. During this period the biological effluent treatment was disturbed and for two days the phosphorus concentration in the final effluent exceeded the permit limit of 5 mg/L (5,08 and 5,88 mg/L). The monthly effluent discharge was 75 kg/d, exceeding the permit limit of 74 kg/d.

On November 24 the daily discharge of phosphorus was 5,6 mg/L, exceeding the limit of 5 mg/L; this disturbance was related to the startup of the effluent treatment plant after the annual maintenance shutdown of the mill.

In all cases authorities were informed and corrective actions taken. None of the non-compliant discharges posed any potential

risk of damage to the environment.

In December 2015 the new effluent treatment unit for phosphorus removal started operations. It was installed as a requirement of the authorities to comply with a new permit limit for phosphorus discharge to the river, established at 60 kg/d as annual average.

Because of the high phosphorus content of eucalyptus raw material, the internal target for phosphorus load in the final effluent was exceeded in two months, which showed an improvement compared to the previous year. Phosphorus discharge is expected to stay at low levels during 2016 with the new system for removing phosphorus from raw effluent.

Water quality monitoring results show that there is no significant variation between the sampling points located upstream and downstream from the mill that could be caused by its operation. Variation in time is similar in all sampling points, either reference points or near receptors of the mill's effluents.

Fish monitoring results continue to show that the amount of different fish species found after the start-up of the mill is at the same level found during the baseline studies, and the situation is the same at all three study areas, either upstream or downstream from the mill. The condition of fish caught has

been observed to be good without any macroscopic deformities or abnormalities. There are no differences in the general condition of fish caught from the different study areas.

The fish bile investigations indicate that the concentrations of chlorophenolic compounds and phytosterols are within the variation limits as observed during the baseline studies and there are no indications of changes in the concentration levels caused by the effluent discharged from the UPM pulp mill or any other sources.

Muscle concentrations of dioxins, furans and PCBs were below the Total Daily Intake recommendations and, based on the observed concentrations and international recommendations there would be no limitations to human consumption of the studied fish.

The results indicate that the effluent discharge from the UPM Fray Bentos mill has not caused any impacts on the fish community and species diversity, or on the exposure level of fish, as compared to the situation prior to the mill operation.

Waste

The UPM Fray Bentos landfill site is located inside the mill complex. In 2015 the landfill received 97,000 t of waste (on wet basis).

The second stage of the landfill started operations during the last quarter of 2015.

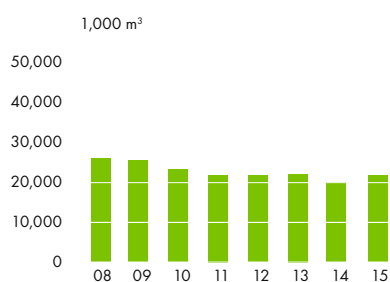
Green liquor dregs represented approximately 69% of the total dry weight of solid waste bound for the landfill site.

Wood waste (mainly bark and wood fines) continues to be returned to plantations for soil improvement, as well as sludge from the primary clarifier. However, in 2015 about 43% of the wood waste (on wet basis) was used as a biofuel for electricity generation in external facilities.

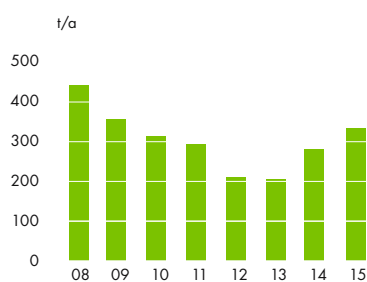
Secondary sludge, i.e. excess biosludge from the activated sludge system, continues to be burned in the recovery boiler by mixing it with the black liquor. In 2015 it was necessary to dispose part of this biosludge at the landfill site to avoid excessive build-up in the aeration basins.

The generation of hazardous waste in 2015 amounted to 84 t, of which more than 70% corresponds to filtration cake from the production of sodium chlorate at the chemical plant, spent batteries from electrical rooms, and used lubricating oils.

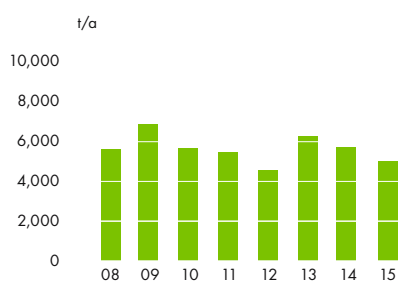
EFFLUENT FLOW (PROCESS WASTEWATER)



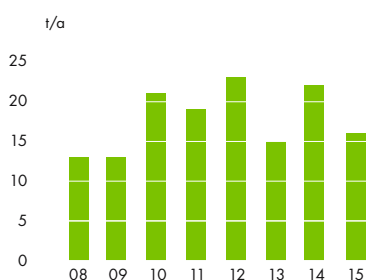
TOTAL SUSPENDED SOLIDS, TSS



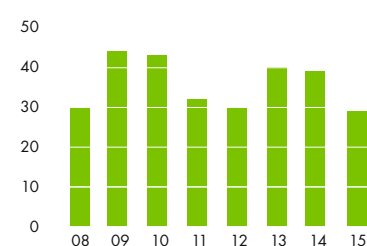
CHEMICAL OXYGEN DEMAND, COD



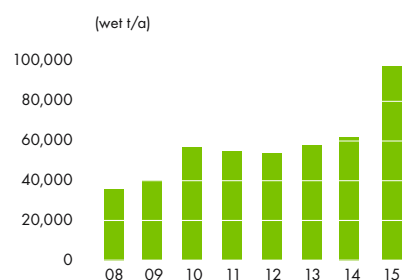
PHOSPHORUS, P



ADSORBABLE ORGANIC HALOGEN COMPOUNDS, AOX



SOLID WASTE TO INDUSTRIAL LANDFILL



Environmental parameters 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.

Production capacity	Pulp	1,300,000 t
Raw materials and additives	Wood Pulping and bleaching chemicals	See UPM Corporate Environmental Statement for more information
Energy	Biogenic fuels Fossil fuels	94% 6%
Emissions to air	Carbon dioxide, CO ₂ (fossil) Nitrogen oxides, NO _x Sulphur dioxide, SO ₂ Dust Total reduced sulphur, TRS	137,126 t 1,688 t 130 t 315 t 5 t
Water intake	Process and cooling water	28,400,000 m ³
Discharges to water	Process waste water Process waste water quality indicators – Biological oxygen demand, BOD ₅ – Chemical oxygen demand, COD – Suspended solids, TSS – Nitrogen, N (total) – Phosphorus, P (total) – Adsorbable organic halogen compounds, AOX	21,800,000 m ³ 179 t 5,005 t 333 t 54 t 16 t 29 t
Waste	Waste to landfill* Green liquor dregs Wastewater sludge Water treatment sludge Others Waste recycled* Wood and bark waste Primary sludge (fiber sludge) Others Hazardous waste	 23,571 t 8,863 t 1,234 t 1,113 t 70,064 t 6,072 t 309 t 84 t
Size of mill area		500 ha



* Dry weight

Environmental objectives

Among the objectives set for 2016, the following can be highlighted:


- Comply with laws, local permits and other external commitments subscribed by the mill.
- Ensure compliance of requirements set in the Ministry Resolution 1334/2013, which granted authorization to increase annual production, and subsequent related resolutions.
- Continue transparent and effective communication of environmental issues to all stakeholders.
- Contribute to UPM's corporate commitment to environmental responsibility, including implementation of Clean Run campaign and compliance of corporate targets for 2016.
- Promote environmental awareness within the mill, its main suppliers and partners, and all subcontractors working in mill area.
- Comply with the key environmental indicators defined for 2016 (see below).

Performance against targets in 2015

	TARGET	PERFORMANCE
COD discharge to the river (annual average)	≤ 5 Kg/ADT	achieved
Effluent discharge to the river (annual average)	≤ 20 m ³ /ADT	achieved
Total phosphorus discharge to the river (monthly average)	≤ 60 Kg/d	not achieved: over target in 2 months
Availability of strong odorous gases handling (annual average)	≥ 99.9%	achieved
Availability of mild odorous gases handling (annual average)	≥ 99.5%	achieved
Amount of permit exceedances	None	not achieved: 3 incidents

Current targets

	TARGET
COD discharge to the river (annual average)	≤ 5 Kg/ADT
Effluent discharge to the river (annual average)	≤ 20 m ³ /ADT
Total phosphorus discharge to the river (monthly average)	≤ 60 Kg/d
Availability of strong odorous gases handling (annual average)	≥ 99.9%
Availability of mild odorous gases handling (annual average)	≥ 99.5%
Amount of permit exceedances	None



VALIDATION STATEMENT

As an accredited environmental verifier (FI-V-0001), Inspecta Sertifiointi Oy has examined the environmental management system and the information of UPM Fray Bentos Environmental Performance 2015 report and of UPM Corporate Environmental statement 2015. On the basis of this examination, the environmental verifier has herewith confirmed on 2016-04-25 that the environmental management system, this UPM Fray Bentos Environmental Performance report and the information concerning UPM Fray Bentos of UPM Corporate Environmental statement are in compliance with the requirements of the EMAS Regulation (EC) No 1221/2009.

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