

UPM Fray Bentos

ENVIRONMENTAL AND SOCIETAL RESPONSIBILITY **2018**



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. The initial 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. Wood procurement is under the responsibility of UPM Forestal Oriental, which has been pioneering the development of eucalyptus plantations in Uruguay for over 30 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. EMAS-reporting covers UPM Fray Bentos. Societal reporting covers both UPM Fray Bentos and UPM Forestal Oriental.



Production capacity	1,300,000 ADt
Personnel	213
Products	UPM Euca (bleached eucalyptus kraft pulp)
Bioenergy	Electricity
Certificates	EMAS – EU Eco-Management and Audit Scheme ISO 14001 – Environmental Management System ISO 9001 – Quality Management System ISO 50001 – Energy Management System ISO 22000 – Food Safety Management System OHSAS 18001 – Occupational Health and Safety System 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)
Environmental labels	UPM pulp products have the approval for use in EU Ecolabel and Nordic Ecolabel paper products.



UPM Fray Bentos Environmental and Societal Responsibility 2018 is a supplement to the Corporate Environmental and Societal Responsibility Statement of UPM's pulp and paper mills (available at www.upm.com) and provides mill-specific environmental and societal performance data and trends for the year 2018. The annually updated mill supplements and the UPM Corporate Environmental and Societal Responsibility Statement together form the joint EMAS Statement of UPM Corporation. The next UPM Corporate Environmental and Societal Responsibility Statement and also this supplement will be published in 2020.

We deliver renewable and responsible solutions and innovate for a future beyond fossils across six business areas: UPM Biorefining, UPM Energy, UPM Raflatac, UPM Specialty Papers, UPM Communication Papers and UPM Plywood. We employ around 19,000 people worldwide and our annual sales are approximately EUR 10.5 billion. Our shares are listed on Nasdaq Helsinki Ltd. UPM Biofore – Beyond fossils. www.upm.com



The mark of responsible forestry

For more information about FSC® certification visit www.fsc.org



For more information about PEFC certification visit www.pefc.org

Review of year 2018

Performance

The Fray Bentos pulp mill continued to achieve in 2018 a high level of capacity utilization, maintaining its reliability in pulp quality as well as a high level of environmental performance.

One event with permit non-compliance occurred during the year. Due to sludge filamentous bulking in effluent secondary treatment, as a result of filamentous bacteria growth, settleable solids concentration in the final effluent exceeded the daily permit limit of 1 mL/L for several days during July and August 2018 (the highest concentration measured was 18 mL/L).

The non-compliant discharges did not pose 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. Due to several electrical failures, resulting in operational disturbances, during the second half of the year, handling of malodorous gases was not in accordance with internal targets. As for the generation of odours in the equalization and safety basins of the effluent treatment plant, the situation highly improved in comparison to 2016 and 2017 due to the operational actions implemented.

UPM Fray Bentos pulp mill is self-sufficient in electrical consumption through the energy generated by burning black liquor.

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, eleven years after the start-up, 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

Press releases related to events at the mill that could affect the community are shared with the follow-up commission, local press and published in UPM's corporate website. Monthly inspections have been carried out by the Scientific Committee (integrated by Uruguayan and Argentinian members) of the Uruguay River Executive Commission (CARU). Since this committee was established, by December 2018, 91 inspections have been carried out. During 2018 no sessions of the follow-up commission have been convened by the authorities.

As part of the environmental monitoring plan requested by Uruguayan environmental authorities, social monitoring has been carried out biannually. A summary of the information gathered since 2008 was presented to the community in August 2018. This information is available in UPM's webpage.

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, around 30.000 people from Uruguay and several other countries have visited our facilities.



Marcos Batteggazzore
Vice President, UPM Uruguay Operations



Gervasio González
Environmental Manager

Responsibility figures 2018

Waste



Decrease in waste to landfill

30%

Calculated comparing wet tons of waste sent to landfill in 2018 and 2017.

54%

of total non-hazardous waste generated in 2018 returned to plantations, used as soil improver.

Water



Reduction in effluent volume per ton of pulp

29%

Reduction in water usage per ton of pulp

23%

Calculated comparing 2018 to 2009 performance.

Certified fibre



88%

of fibre used in pulp production was FSC® and/or PEFC certified. UPM's target is to use only certified fiber by 2030.



Energy

92%

of fuels used in UPM Fray Bentos energy production during 2018 became from renewable sources.

Environmental monitoring



Over 40

sampling points monitored by outsourced laboratories including river, underground water, soil and air.



Employment

UPM Fray Bentos employed

213 people

About 850 people enter the mill site daily.

Safety



Total Recordable Injury Frequency (TRIF)

0 injuries

per million hours worked.

5 years

without Lost Time Accidents (LTA) in own personnel.*

382

reported Safety Walks and Inspections

* A Lost Time Accident is an on the job accident that results in an employee being absent from the workplace for a minimum of one work day.

Community



22 projects

promoted by UPM Foundation in 2018

Projects' focus: 80% education; 20% community engagement.

Biodiversity

UPM is the first private company in Uruguay to manage an area within the National System of Protected Areas.

11,100 ha

of conservation areas managed by UPM, covering native forest, grasslands, wetlands, riparian zones and palm areas.



Qualified spend

96%

of raw materials spend qualified against UPM Supplier and Third Party Code (wood not included).

Taxes



USD 28 million

Paid by UPM companies in Uruguay in 2018, including:

- Income taxes on salaries
- Corporate income taxes and Free Trade Zone fees
- Property taxes including real estate tax
- Value Added Tax cost

Air



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

Handling of malodorous gases from the production process was not in accordance with internal targets due to operational disturbances caused by electrical failures taken place five times between August and October 2018. Corrective actions were implemented.

As for the generation of odours in the equalization and safety basins of the effluent treatment plant, the situation has highly improved in comparison to 2016 and 2017. The actions implemented during 2017 have greatly contributed to minimize the growth of anaerobic micro-organisms responsible for the generation

of odorous compounds, thus reducing the frequency of odour perception outside the mill limits.

In 2018, four external complaints related to odour events were recorded. Two of them were associated to recovery boiler trips due to electrical failures. Usually the odour events during those periods had a duration of minutes with varying odour intensity.

Despite the potential nuisance created to people, odours originated at the pulp mill do not pose any potential risk of harm to the environment or human health.

The mill continues to proactively communicate 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 and BAT.

Water



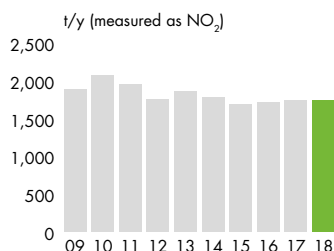
UPM Fray Bentos acquires raw water from the Uruguay River. The operations required about 0.88 m³ of water per second and generated about 0.66 m³ per second of treated effluent.

Due to sludge filamentous bulking in effluent secondary treatment, as a result of filamentous bacteria growth, settleable solids concentration in the final effluent exceeded the daily permit limit of 1 mL/L for several days during July and August 2018 (the highest concentration measured was 18 mL/L). After an exhaustive cause analysis study, it was concluded that these episodes could have been due to operational problems at the primary treatment during May and June 2018 causing a considerable amount of fibers reach the secondary treatment as well as areas of anaerobic conditions and poor agitation in the aeration system as a result of poor performance of air distribution in certain locations.

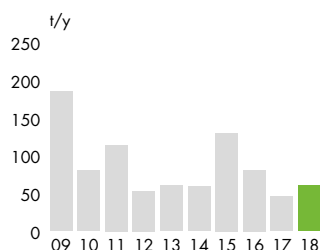
Authorities were informed, corrective actions were established and implemented. These non-compliant discharges did not pose any potential risk of damage to the environment.

The total phosphorus load exceeded the monthly average internal target of 60

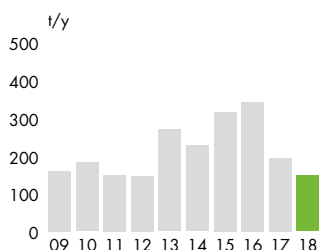
Nitrogen oxides, NO_x



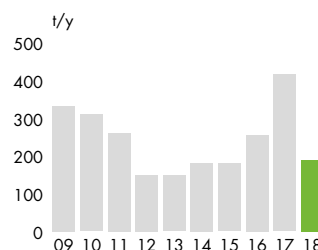
Sulphur dioxide, SO₂



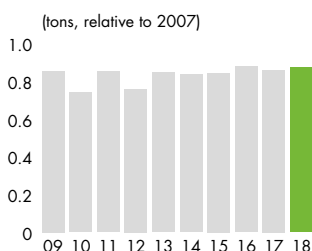
Dust



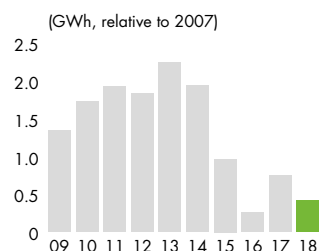
Biological oxygen demand, BOD₅



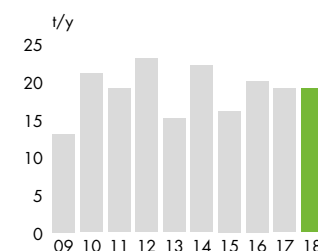
Evolution of fuel oil consumption



Evolution of electricity supplied to the national grid



Phosphorus, P





Kg/d four times in 2018 (May, August, September and November). Phosphorus load permit limit (74 Kg/d) was not exceeded in any of these months. In May 2018 the phosphorus load monthly average was 62 Kg/d. This was due to biosludge death in the aeration basins as a consequence of disturbances in the effluent treatment plant during the mill's maintenance shutdown. The August and September internal target exceedances (69 and 67 Kg/d) were related to the sludge filamentous bulking and the actions implemented to restore the aeration system (oxygen peroxide addition and replacement of diffusing membranes). In November 2018 the monthly average load was 61 Kg/d. This was possibly related to disturbances in the effluent phosphorus removal treatment. In all these situations corrective actions were implemented.

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 has been carried out biannually. 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.

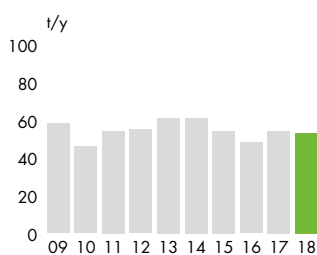
The fish bile investigations indicate that the concentrations of chlorophenolic compounds and phytosterols are within the variation limits as observed during the baseline studies and there are no indications of changes in the concentration levels caused by the effluent

discharged from the UPM pulp mill or any other sources.

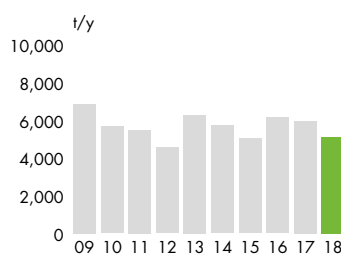
Muscle concentrations of dioxins, furans and PCBs were below the Total Daily Intake recommendations and, based on the observed concentrations and international recommendations there would be no limitations to human consumption of the studied fish.

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.

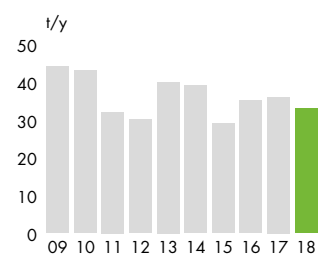
Nitrogen (inorganic), N



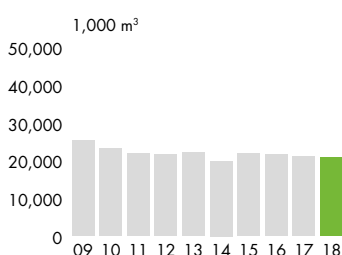
Chemical oxygen demand, COD



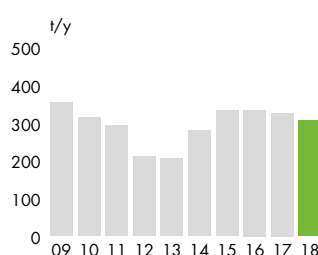
Adsorbable organic halogen compounds, AOX



Effluent flow (process wastewater)



Total suspended solids, TSS



Waste



The UPM Fray Bentos landfill site is located inside the mill complex. In 2018 the landfill received 32,900 t of waste on dry basis.

Green liquor dregs represented approximately 51% of the total dry weight of solid waste bound for the landfill site.

Wood waste (mainly bark) continues to be returned to plantations for soil improvement, as well as sludge from the primary clarifier and dry biosludge from the activated sludge system. These types of waste, in 2018, represent a total of 60,000 ton dry basis.

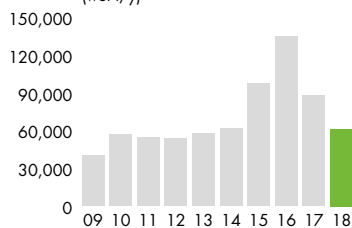
In 2018 there was a decrease of 30% in the amount of waste disposed at the landfill site in comparison to the previous year. This is mainly due to the biosludge dryers start-up (July 2017) and the use of this type of waste as soil improver. A small proportion of biosludge continued to be burned in the recovery boiler by mixing it with the black liquor.

In 2018 about 25% of the wood waste was used as a biofuel for electricity generation in external facilities.

The generation of hazardous waste in 2018 amounted to 79 t, of which more than 70% corresponded to filtration cake from the production of sodium chlorate at the chemical plant, maintenance waste, and used lubricating oils and greases.

Solid waste to industrial landfill

(wet t/y)



Societal responsibility

“Promoting continuation of studies in rural areas”

“Sembrando mi futuro” is an educational program promoted by UPM Foundation jointly with DESEM “Jóvenes Emprendedores”. The main objective is to foster the continuity of education for young people in rural areas.

The program’s aim is that students of communities of the interior of Uruguay have a wider vision of educational and professional opportunities they could reach in their future.

The program consists of two workshops. The first one works on several aspects related to career guidance, with theoretical and dynamic contents that allow students to reflect on what they have been working on. In addition, the educational offer existing in Uruguay is introduced.

As for the second workshop, deeper career guidance concepts are approached, and the different jobs within the productive chain of forestry and its industrial stages are introduced. In this stage, UPM professionals and technicians share their personal experience.

240 students
of 12 educational centres
(rural primary schools,
Labour University of Uruguay (UTU)
and high schools)

In 4 departments
Río Negro, Paysandú,
Durazno and Tacuarembó

40 collaborators
of UPM involved





450 Children of Rio Negro participated in the UPM Children World Cup, 10 years of Fray Bentos mill

On the 24th of September 2018, at the Fray Bentos “Miguel Young” theatre, the launching of the UPM Children World Cup, 10 years of the Fray Bentos mill, took place.

About 450 boys and girls from 32 teams of all Río Negro department participated. The aim of the football tournament was to promote the values of Integration between towns and cities of Río Negro department, including Fray Bentos, Young, Grecco, San Javier, Sarandí de Navarro, Mellizos, Paso de la Cruz, Algorta, Merinos, El Ombú, Bellaco, Sauce, Menafra and Leopoldo.

At the launch, a conference was held, in which authorities of the Río Negro department as well as authorities of the National Football Youth Organization (ONFI), and representatives of UPM participated.

The UPM Children World Cup was framed in the context of the 10th anniversary of UPM Fray Bentos pulp mill, and took place in the Liebig’s Park, the biggest sports stadium of the Río Negro Department between the 10 and 17 of November 2018.

The purpose of the tournament was to involve children into sports, and it was inspired on the values of respect, integration and effort through sports. The fixture of the UPM Children World Cup

was the same as the one from the Russia World Cup 2018, and every team of the Río Negro department represented one country involved in the last FIFA World Cup.

Río Negro’s mayor, Oscar Terzaghi, said that “the tournament is an excellent idea, since it will allow to reunite youngsters from all the small towns and cities of the department for the first time, fraternizing with children from every part of the country, including the more distant ones”. Furthermore, Luis de Melo, president of the National Football Youth Organization, said that “in the 50 years anniversary of the National Football

Youth Organization, this tournament is an excellent opportunity to celebrate, pointing out that children’s football is a game, children shall always be treated with love, and childhood is not a life stage where we can put pressure on young athletes, but on the contrary, is a stage where they have to enjoy”.

According to statistics provided by the National Football Youth Organization, Río Negro is the department of Uruguay with the greatest involvement of boys and girls in children’s football clubs, with 61% of all children between 6 and 13 years old.



Environmental parameters 2018

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 and Societal Responsibility Statement.

Production capacity	Pulp	1,300,000 t
Raw materials and additives	Wood Pulping and bleaching chemicals	See UPM Corporate Environmental and Societal Responsibility Statement for more information
Energy	Biomass based fuels Fossil fuels	92% 8%
Emission to air	Carbon dioxide, CO ₂ (fossil) Nitrogen oxides, NO ₂ Sulphur dioxide, SO ₂ Particulates Total Reduced sulphur, TRS	142,038 t 1,745 t 60 t 147 t 9 t
Water intake	Process and cooling water	27,849,377 m ³
Discharges to water	Process wastewater Process wastewater quality indicators – Biochemical oxygen demand, BOD ₅ – Chemical oxygen demand, COD – Suspended solids, TSS – Nitrogen, N (total) – Phosphorus, P (total) – Adsorbable organic halogen compounds, AOX	20,790,932 m ³ 188 t 5,081 t 306 t 53 t 19 t 33 t
Waste	Non-hazardous waste Waste to recycling, energy recovery and/or composting – Sludges – Bark and wood waste – Others Waste to landfill and incineration w/o energy recovery – Green liquor dregs – Sludges – Lime – Others Hazardous waste	 15,378 t 61,629 t 503 t 16,834 t 6,917 t 6,305 t 2,840 t 79 t
Size of mill area		500 ha

* Dry weight



Environmental objectives

Among the objectives set for 2019, the following can be highlighted:

- Continue transparent and effective proactive communication of environmental issues to all stakeholders.
- Contribute to UPM's corporate commitment to environmental responsibility.
- 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 2019 (see below).

Performance against targets in 2018

	TARGET	ACHIEVEMENT
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 internal target in 4 months
Availability of strong odorous gases handling (annual average)	≥ 99.9%	Not achieved, 99.5%
Availability of mild odorous gases handling (annual average)	≥ 99.5%	Not achieved, 99.3%
Amount of permit exceedances	None	Not achieved: 1 incident (see page 6)

Targets for 2019

	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 and Societal Responsibility 2018 report and of UPM Corporate Environmental and Societal Responsibility Statement 2018.

On the basis of this examination, the environmental verifier has herewith confirmed on 2019-04-04 that the environmental management system, this UPM Fray Bentos Environmental and Societal Responsibility report and the information concerning UPM Fray Bentos of UPM Corporate Environmental and Societal Responsibility Statement are in compliance with the requirements of the EMAS Regulation (EC) No 1221/2009.

We reduce the world's reliance on fossil-based materials by developing renewable and responsible products and solutions in all our businesses. **UPM Biofore – Beyond fossils.**



www.upm.com

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