

UPM Fray Bentos

# ENVIRONMENTAL AND SOCIETAL RESPONSIBILITY 2019



# 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 the 8<sup>th</sup> November 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 Linde.

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



<b>Production capacity</b>	1,300,000 ADt
<b>Personnel</b>	211
<b>Products</b>	UPM Euca (bleached eucalyptus kraft pulp)
<b>Bioenergy</b>	Electricity
<b>Certificates</b>	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 <a href="http://www.upm.com/responsibility">www.upm.com/responsibility</a> )
<b>Environmental labels</b>	EU Ecolabel Nordic Ecolabel  UPM pulp products have the approval for use in EU Ecolabel and Nordic Ecolabel paper products.



UPM Fray Bentos Environmental and Societal Responsibility 2019 is a supplement to the Corporate Environmental and Societal Responsibility Statement of UPM's pulp and paper mills (available at [www.upm.com](http://www.upm.com)) and provides mill-specific environmental and societal performance data and trends for the year 2019. 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 Updated UPM Corporate Environmental Statement and also this supplement will be published in 2021.

UPM offers 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. As the industry leader in responsibility we are committed to the UN Business Ambition for 1.5°C and the science-based targets to mitigate climate change. We employ 18,700 people worldwide and our annual sales are approximately EUR 10.2 billion. Our shares are listed on Nasdaq Helsinki Ltd. UPM Biofore – Beyond fossils. [www.upm.com](http://www.upm.com)



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# Review of year 2019

## Performance

The Fray Bentos pulp mill continued to achieve in 2019 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. During the routine weekly inspection of the mill's stormwater ponds carried out in the 17<sup>th</sup> June 2019, a pH value of 9.95 was measured in the pond located in effluent treatment plant area. Due to heavy rains during previous hours, some lime from the storage area was washed down to the stormwater pond. The pH measured exceeded the upper permit limit established for effluent discharge (pH 9). The non-compliant discharge 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. Handling of malodorous gases was in accordance with internal targets. As for the generation of odours in the equalization and safety basins of the effluent treatment plant, the situation remained stable and in good conditions due to the operative actions taken during previous years.

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 the 26<sup>th</sup> September 2014.

UPM Fray Bentos mill Operational Environmental Authorization was renewed on the 1<sup>st</sup> November 2019.

Uruguayan environmental authorities approved a new version of the Operational Environmental Management Plan which includes changes in the environmental monitoring plan.

## Environmental monitoring

UPM Fray Bentos mill is one of the most monitored pulp mills worldwide, with more than 130 control parameters covering Uruguay river (water and biology), air, soil, fauna, groundwater, noise, among others.

Environmental monitoring activities under the responsibility of UPM Fray Bentos and implemented by several external experts continue to show, twelve years after the startup, that there is no negative impact on the environment related to the operation of the pulp mill.

## Transparency

Press releases related to planned works that could cause e.g. odours or noise in the surrounding areas of Fray Bentos are proactively shared beforehand with the local press, follow-up commission, Uruguayan environmental authorities as well as published in UPM's corporate website.

During 2019 no sessions of the follow-up commission have been convened by the authorities.

Monthly inspections have been carried out by the Scientific Committee (inte-

grated by Uruguayan and Argentinian members of the Uruguay River Executive Commission (CARU). In September 2019 inspection number 100 was carried out, reaching 103 in total by December 2019. Results of the monitoring carried out during these inspections are available in CARU's website.

Results of the environmental monitoring plan requested by Uruguayan environmental authorities are 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. The aim of the visits is to share the Biofore vision by reinforcing the stakeholders engagement, showing the operations to the public. Since 2008, around 35,000 people from Uruguay and several other countries have visited our facilities.



Federico Mantiñan  
General Manager



Gervasio González  
Environmental Manager

# Responsibility figures 2019

## Waste



**55%**

of total non-hazardous waste generated in 2019 returned to plantations, used as soil improver.

**26%**

of total non-hazardous waste generated in 2019 was disposed in landfill.

## Environmental monitoring

Over **40**

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

Over **3,000**

analytical environmental results from UPM Fray Bentos pulp mill effluent, monitored annually by third parties.

Over **50,000**

water quality data in different points of the Uruguay River, allowing to compare the situation upstream, close to the mill's discharge and downstream, as well as the variation throughout time.

## Water



Reduction in biological oxygen demand per ton of pulp:

**44%**

Reduction in chemical oxygen demand per ton of pulp:

**31%**

Reduction in total suspended solids discharge per ton of pulp:

**39%**

All figures calculated comparing 2019 to 2010 performance.

## Environmental sustainability



**31** environmental observations

By actively doing environmental observations and taking needed actions beforehand, we efficiently prevent Environmental deviations.

**31** environmental rounds

carried out to subcontractors working within UPM Fray Bentos mill premises.



## Energy

**92%**

of fuels used in UPM Fray Bentos energy production during 2019 became from renewable sources.

## Supply chain



# 97%

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

## Certified fibre



# 91%

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

## Safety



Total Recordable Injury Frequency (TRIF):

# 3.2 injuries

per million hours worked.  
(process areas: UPM employees & Contractors).

# 534

reported Safety Walks and Inspections  
Safety walks are conducted with the aim of improvement.

# 740

Safety observations  
Safety observation: identification of potentially unsafe working environment or unsafe working.

## Employment



UPM Fray Bentos employed

# 211 people

directly.

## Community



# 21 projects

promoted by UPM Foundation in 2019.  
– 60 communities involved.  
– 2,200 participants.  
– 130 UPM volunteers

# 3,500 people

visited UPM Fray Bentos mill during 2019:  
– 1,500 institutional visits from key stakeholders.  
– 2,000 visits from the public in general (guided tours).

## Taxes



Total taxes approx.

# USD 33 million

paid by UPM companies in Uruguay in 2019, including:  
– Income taxes on salaries  
– Corporate income taxes and Free Trade Zone fees  
– Property taxes including real estate tax  
– Value Added Tax cost

# Air

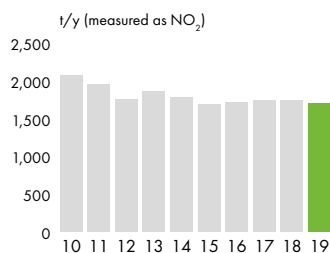


Emissions into the air remained at very good levels, with all parameters within the conditions of the environmental permit.

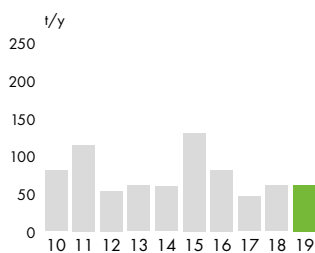
Handling of malodorous gases from the production process was in accordance with 2019 internal targets.

As for the generation of odours in the equalization and safety basins of the effluent treatment plant, the situation remained under control and stable as in 2018, in comparison to 2016 and 2017. The actions implemented during 2017 and maintained in 2018 have greatly contributed to minimize the growth of anaerobic microorganisms responsible for the production of odorous compounds, thus reducing the frequency of odour perception outside the mill limits.

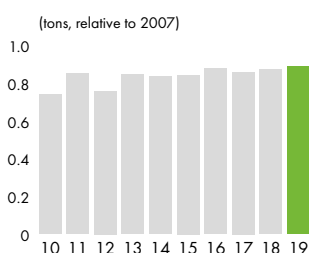
**Nitrogen oxides, NO<sub>x</sub>**



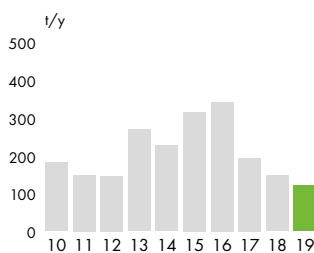
**Sulphur dioxide, SO<sub>2</sub>**



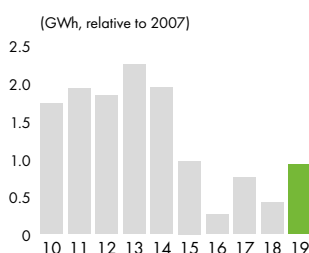
**Evolution of fuel oil consumption**



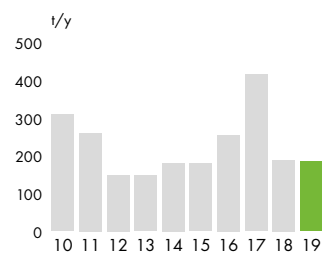
**Dust**



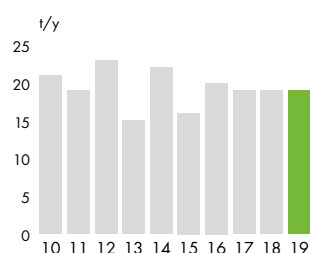
**Evolution of electricity supplied to the national grid**



**Biological oxygen demand, BOD<sub>5</sub>**



**Phosphorus, P**



# Water



UPM Fray Bentos acquires raw water from the Uruguay River. The operations used about 0.89 m<sup>3</sup> of water per second and generated about 0.67 m<sup>3</sup> per second of treated effluent.

During the routine weekly inspection of the mill's stormwater ponds carried out on the 17<sup>th</sup> June 2019, a pH value of 9.95 was measured in the water discharged from the pond located in effluent treatment plant area to the river. Heavy rains registered on the 16<sup>th</sup> and 17<sup>th</sup> of June could have caused lime carryover from the lime storage area resulting in pH increase in the stormwater pond. The pH measured exceeded the upper permit limit established for effluent discharge (pH 9).

Authorities were informed, corrective actions were established and implemented in order to avoid lime carryover to the corresponding stormwater pond. These non-compliant discharges did not pose any potential risk of damage to the environment.

The 2019 annual average phosphorus load fulfilled the permit limit of 0.06 t/d. The phosphorus load exceeded the monthly average internal target of 60 kg/d four times in 2019 (March, June, July and August). In none of these months, phosphorus load permit limit

In 2019, three external complaints related to odour events were recorded. One of them was associated to disturbances in the malodorous gases handling due to the lowering of the production process for unplanned repairs in a cooling water pipe. For the others, no evidence of origin within the pulp mill could be found.

Usually the odour events during those periods had a duration of minutes with varying odour intensity.

Despite the 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. In 2019, six press releases were published.

Ambient air quality measurements show that the operation of the pulp mill has no significant effect on air quality, and all measured parameters have remained below limits established by Uruguayan environmental authorities and within the limits established in the environmental permit and BAT.

(74 kg/d) was exceeded. In March 2019 the phosphorus load monthly average was 62 kg/d. This was due to a boiler trip taken place by the end of February and a stop in fibre line process on the 8 of March resulting in disturbances in the effluent treatment plant including biomass death in the aeration basins.

In June the phosphorus load monthly average was 63 kg/d. This situation was caused by the need of unplanned maintenance activities in the fibre line process that caused disturbances in the effluent treatment plant.

The July and August internal target exceedances (69 kg/d in both months) were related to decrease in the efficiency of the phosphorus removal system from the effluent treatment plant. 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 since 2005. Results continue

to show that there is no decrease in the number of fish species, biomass or abundance in the zone of influence of UPM Fray Bentos mill's effluent discharge with respect to the reference area during baseline studies. Furthermore, 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 EOX, resinic acids and chlorophenolic compounds are within the variation limits as observed during the baseline studies. As for phyosterols concentrations in fish bile, the trend shows an increase since 2007, equally in the three areas of study (upstream, area of influence of the mill's effluent discharge and downstream). Therefore, there are no indications of changes in the concentration levels caused by the effluent discharged from the UPM Fray Bentos pulp mill.

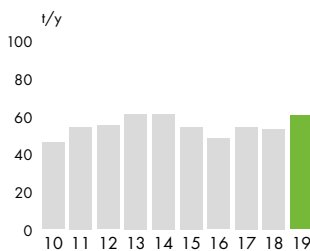
Muscle concentrations of dioxins, furans and PCBs were below the Total Daily Intake recommendations and, based on the observed concentrations



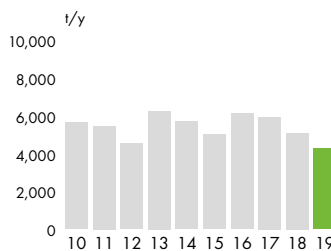
and international recommendations there would be no limitations to human consumption of the studied fish.

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.

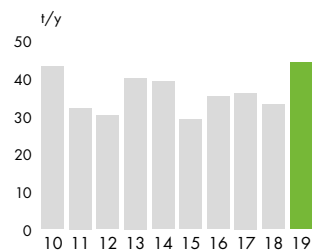
**Nitrogen (inorganic), N**



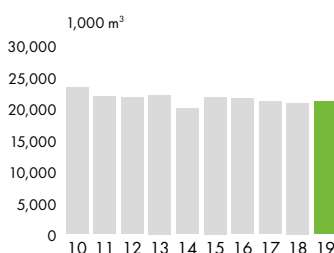
**Chemical oxygen demand, COD**



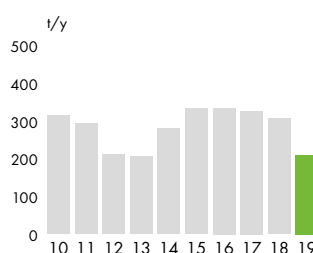
**Adsorbable organic halogen compounds, AOX**



**Effluent flow (process wastewater)**



**Total suspended solids, TSS**



# Waste



The UPM Fray Bentos landfill site is located inside the mill complex. In 2019 the landfill received 28,235 t of waste on dry basis<sup>1)</sup>. This amount represents 26% of total non-hazardous waste generated at the Fray Bentos mill premises during 2019.

Green liquor dregs represented approximately 57% of the total dry weight of solid waste bound for the landfill site.

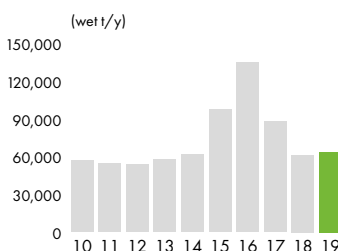
Wood waste (mainly bark) continues to be returned to plantations for soil improvement, as well as sludge from the primary clarifier and dry biosludge from the activated sludge system. These types of waste, in 2019, represent a total of 60,100 t on dry basis (55% of total non-hazardous waste generated at the mill).

In 2019 about 28% of the wood waste was used as a biofuel for electricity generation in external facilities.

The generation of hazardous waste in 2019 amounted to 218 t, representing 0.2% of total waste. More than 70% corresponded to maintenance waste, used lubricating oils and greases, used activated granular carbon and used granular aluminum oxide. The generation of hazardous waste during 2019 particularly increased in comparison to 2018 due to specific maintenance activities carried out.

<sup>1)</sup> Waste disposed of in Municipal landfill not included.

**Solid waste to industrial landfill**



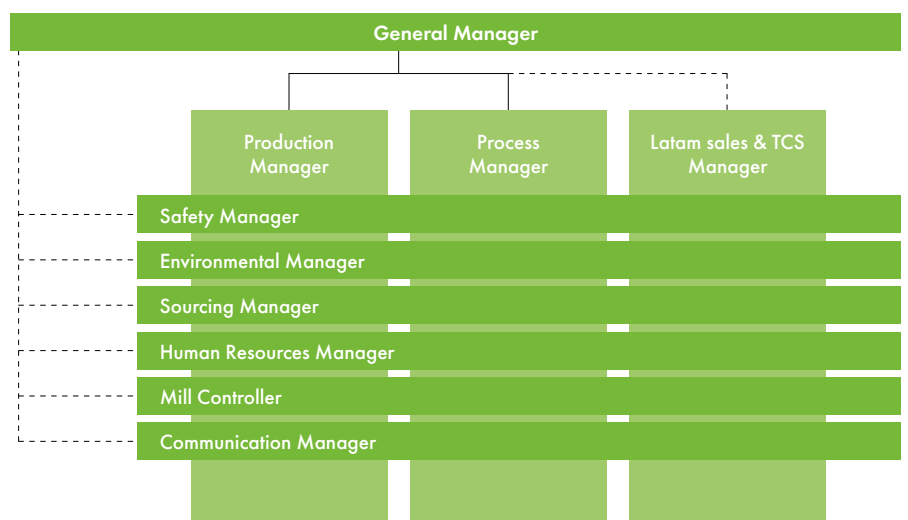
## Organizational structure and emergency organization

Constant awareness of safety and environmental matters is an integral part of UPM Fray Bentos mill's way of working. All employees are responsible for the effects their own field of operation has on the environment and safety. Production Manager is responsible for the environmental performance achieved. The environmental manager coordinates environmental issues within the company, with authorities and with all partners.

As part of the Environmental Operational Management Plan, UPM Fray Bentos mill has a contingency plan approved by Uruguayan environmental authorities which describes the internal procedures to follow in case of environmental contingencies related to the mill operations as well as responsibilities and communication flowchart.

Safety manager together with the mill's safety supervisor and the fire chief, plans and supervises health & safety works

within the company, with authorities and partners. The mill has an operation plan and a program of activities setting out goals, safety targets and plans for achieving them. In the event of an emergency response, UPM Fray Bentos mill has a fire brigade made up of seventy brigadiers including mill engineers and technicians from UPM and other outsourced companies working within the mill boundaries (Andritz, Kemira, Linde). The brigadiers are strategically distributed in five shifts in accordance with the mill's operations. The fire brigade is continuously trained by qualified personnel. In 2019, twenty sessions per shifts were carried out. Furthermore, emergency situations rehearsals are frequently conducted. During 2019, 4 rehearsals were carried out including: escape of a chemical in process area, fire inside the mill premises, evacuation in case of explosive device, rescue of man overboard, falling between barge and harbor's dock.







## Societal responsibility

### “Postgraduate degree in Curriculum and Evaluation”

The postgraduate is developed by Universidad Católica del Uruguay and it is boosted by Fundación UPM in small towns of the interior of the country. It already counts with three generations of graduate teachers. The first generation graduated in 2018, and they were 27 teachers from Fray Bentos, the city where UPM pulp mill is located.

In 2019, 55 high school teachers that work in the interior of Paysandú and Durazno departments graduated from this postgraduate degree, whose objective is to provide the teachers with new tools in order to improve class planning, evaluation of learning, development of innovating learning methodologies and introduction of digital technology in the room, among others.

“In Fundación UPM we impulse this formation with the aim of providing teachers an opportunity of training in the interior of the country; this postgraduate degree used to be taught only in Montevideo and since 2017 we have been developing it in three departments: Río Negro, Paysandú and Durazno”, says Magdalena Ibañez, President of Fundación UPM. “Our goal is to improve access to Education providing different opportunities in the interior of the country”, she concludes.

### Sponsorships in Fray Bentos during 2019

UPM sponsored 14 projects in the Fray Bentos community in 2019. The focus of the sponsorships, donations and employee volunteering is to promote activities and programs that are relevant to UPM’s business, support innovation and sustainability values or promote local vitality and wellbeing. They are also clearly linked to several United Nations’ Sustainable Development

Goals (SDG’s) which UPM wants to promote. Aligned with this core values, the projects sponsored by UPM in Fray Bentos include Sports and Culture.

### “Jazz en el Anglo” 2019: Bringing closer cultural events in the interior of the country

The Jazz music festival took place on the 11<sup>th</sup> January 2019, on the Anglo Museum of the Industrial Revolution, one of the traditional venues of Fray Bentos, which is loaded with history and has a legacy of industrial culture. This event involves world class international Jazz bands, and its attendance is around 1,500 people, who can assist the show freely. “The fact that the Jazz en el Anglo show is held on the Museum of the Industrial Revolution does not only promote a cultural scene within the Fray Bentos audience, but it also gathers people from other parts of the country”, said Estela Golovchenko, director of Culture of the Río Negro Government, on the 2019 edition of the festival.

### Liebig’s “Regata del Patrimonio” 2019: Boosting healthy competition values and team work through sports culture

On 2019, the third Regata del Patrimonio Rowing Race took place. It was created by the local Fray Bentos Liebig’s Rowing Club, and it has been declared an official national race by the Uruguayan Rowing Federation. According to Martín Ferrás, Chairman of the host club, “more than 150 athletes from all ages compete in this two-day event, and it has an overall audience of 5,000 attendees on all the locations and categories”. Around 10 rowing clubs from Uruguay and Argentina compete on several categories and on 2019, the race was declared as a ministerial interest event by the Tourism Ministry of Uruguay.



# Environmental parameters

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.

		2017	2018	2019
<b>Production capacity</b>	Pulp	1,300,000 t	1,300,000 t	1,300,000 t
<b>Raw materials and additives</b>	Wood Pulping and bleaching chemicals	1)		
<b>Energy<sup>1)</sup></b>	Biogenic fuels Fossil fuels	93% 7%	92% 8%	92% 8%
<b>Emission to air</b>	Carbon dioxide, CO <sub>2</sub> (fossil) Nitrogen oxides, NO <sub>2</sub> Sulphur dioxide, SO <sub>2</sub> Particulates Total Reduced sulphur, TRS	139,570 t 1,733 t 46 t 194 t 8 t	142,038 t 1,745 t 60 t 147 t 9 t	144,127 t 1,697 t 61 t 120 t 7 t
<b>Water intake</b>	Process and cooling water	28,294,734 m <sup>3</sup>	27,849,377 m <sup>3</sup>	27,963,847 m <sup>3</sup>
<b>Discharges to water</b>	Process wastewater Process wastewater quality indicators – Biochemical oxygen demand, BOD <sub>5</sub> – Chemical oxygen demand, COD – Suspended solids, TSS – Nitrogen, N (total) – Phosphorus, P (total) – Adsorbable organic halogen compounds, AOX	21,080,999 m <sup>3</sup> 414 t 5,928 t 326 t 54 t 19 t 36 t	20,790,932 m <sup>3</sup> 188 t 5,081 t 306 t 53 t 19 t 33 t	21,100,626 m <sup>3</sup> 184 t 4,280 t 209 t 60 t 19 t 44 t
<b>Waste<sup>2)</sup></b>	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 – Others  Hazardous waste	3)		
			15,378 t 61,629 t 503 t  16,834 t 6,917 t 6,305 t  79 t	15,372 t 63,967 t 448 t  16,225 t 5,686 t 6,767 t  218 t
<b>Size of mill area<sup>4)</sup></b>		553 ha	553 ha	553 ha

<sup>1)</sup> See UPM Corporate Environmental and Societal Responsibility Statement for more information.

<sup>2)</sup> Dry weight

<sup>3)</sup> Reporting of waste data was changed in 2018.

<sup>4)</sup> Built area including buildings, roads, squares, etc. represent 20% of total mill area.



# Environmental objectives

Among the objectives set for 2020, 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, including compliance of Clean Run targets.
- 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 2020 (see below).

## Performance against targets in 2019

	TARGET	ACHIEVEMENT
COD discharge to the river (annual average)	≤ 5 kg/ADt	Achieved
Effluent discharge to the river (annual average)	≤ 20 m <sup>3</sup> /ADt	Achieved
Total phosphorus discharge to the river (monthly average)	≤ 60 kg/d	Not achieved: over internal target in 4 months (see page 6)
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: 1 incident (see page 6)

## Targets for 2020

	TARGET
COD discharge to the river (annual average)	≤ 5 kg/ADt
Effluent discharge to the river (annual average)	≤ 20 m <sup>3</sup> /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



### Revalidation statement

As an accredited environmental verifier (FI-V-0001), Inspecta Sertifiointi Oy has examined the environmental management system and updated UPM Fray Bentos Environmental and Societal Responsibility 2019 report as well as the information concerning UPM Fray Bentos in the Updated UPM Corporate Environmental Statement 2019.

On the basis of this examination, the environmental verifier has herewith confirmed on 2020-04-01 that the environmental management system, the updated UPM Fray Bentos Environmental and Societal Responsibility report and the information concerning UPM Fray Bentos in the Updated UPM Corporate Environmental 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](http://www.upm.com)

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