

UPM Tervasaari

# Environmental and Societal Responsibility 2017



# UPM Tervasaari

The Tervasaari mill is situated in the centre of the town of Valkeakoski, Finland, at the lower end of the canal between the 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 integrated mill site consists of two paper machines, a power plant, a hydropower plant and a biological effluent treatment plant. Several businesses also operate on the site as tenants. The environmental load caused by these tenants' effluent emissions is included in the data of this report.

The heat required by the Tervasaari mill is produced by the mill's own power plant, and approximately one fifth of the electricity required is also produced at the mill. Heat is also sold to external users for district heating and as steam.

The Tervasaari mill's industrial landfill in Suikki was in use throughout 2017. The closure of the Kalaton landfill went ahead as planned during 2017.

UPM Tervasaari is a centre of expertise in label papers, with a strong focus on the development of existing paper grades and new products.



UPM Tervasaari Environmental and Societal Responsibility 2017 is a supplement to the Corporate Environmental Statement of UPM's pulp and paper mills (available at [www.upm.com](http://www.upm.com)) and provides mill-specific environmental performance data and trends for the year 2017. 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 2019.

UPM leads the forest-based bioindustry into a sustainable, innovation-driven, and exciting future across six business areas: UPM Biorefining, UPM Energy, UPM Raflatac, UPM Specialty Papers, UPM Paper ENA and UPM Plywood. Our products are made of renewable raw materials and are recyclable. We serve our customers worldwide. The group employs around 19,100 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](http://www.upm.com)

<b>Production capacity</b>	300,000 t/a	
<b>Personnel</b>	300	
<b>Products</b>	Label release liners (Base)	
	UPM Brilliant	UPM Honey Recycled
	UPM Brilliant evo	UPM Golden
	UPM Brilliant pro	UPM Golden Recycled
	UPM Brilliant duo	UPM SCK
	UPM Honey	UPM SCK light
	UPM Honey evo	UPM Topaz duo
	UPM Honey light	
<b>Certificates</b>	EMAS – EU Eco-Management and Audit Scheme ISO 14001 – Environmental Management System ISO 9001:2000 – Quality Management System ISO 22000 – Food safety Management System PEFC™ Chain of Custody (CoC):2004 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> )	



For more information about FSC products, please visit [www.fsc.org](http://www.fsc.org)



For more information about PEFC products, please visit [www.pefc.org](http://www.pefc.org)



# Review of the year 2017

The UPM Specialty Papers business area grew in 2017. The mill's operations were advanced by a new operation model and a focus on quality and safety. Production at Tervasaari was slightly lower compared to the previous year.

In 2017, development work at Tervasaari contributed to new sustainability projects such as the development of a label release liner containing recycled fibre, the first commercial product of its kind in the world. The paper is produced from siliconised label release liners that are recovered from customers, which are then processed into high-quality recycled fibre. The recycled label release liner has the same technical properties as the traditional product and it meets the strict criteria required of food products. Tervasaari also continues to work toward the future utilisation of fly ash and other industrial by-products by implementing new techniques. This is all carried out in collaboration with the field's leading experts as well as regulatory authorities.

In recent years, the average grammage of the paper products produced at Tervasaari has decreased each year. Thanks to the modern paper production methods in use, the aim is to produce an increased quantity of thinner, lighter and more environmentally friendly label release liners. This development will lead to a reduction in the use of raw materials and further improve the products' energy efficiency in line with our sustainability goals.

The company-wide Clean Run programme to further improve the management of environmental issues continued. The goals of Clean Run are to increase employees' environmental awareness and reduce abnormal emissions. Clean Run encourages all employees to detect, anticipate and actively prevent non-compliance with environmental policies.

No major environmental non-compliance occurred at the Tervasaari mill in 2017. The established goals for effluent and airborne emissions were achieved with excellent results. Emissions remained clearly below permitted limits. There were no problems with the effluent treatment process at Tervasaari. Tervasaari's environmental management system also records all notifica-

tions related to the environment that originate from outside the mill. In 2017, Tervasaari did not receive any notifications related to the mill's operation. Our operations continued to be evaluated by environmental authorities and by independent external product safety and environmental specialists in 2017.

Tervasaari has been actively involved in UPM's Local Waters project, in which schools near UPM's Finnish mills have the opportunity to study and monitor local waters with donated instruments. Local Rotary clubs have collaborated on this project by acting as links to the schools. The project remained active in Valkeakoski in 2017, with activities such as school trips to learn about wastewater analysis at Tervasaari and to the laboratory of the Water Protection Association of the River Kokemäenjoki (KVVY) in Tampere. School groups were also introduced to KVVY's monitoring of water systems and sampling in practice on the shore of the Lotilanjärvi lake.

In recent years, UPM has run a Step Change in Safety programme to further

improve safety at work. Workplace safety has also been a focus point at Tervasaari for several years, with all indicators showing improved results. Nevertheless, in 2017 Tervasaari fell short of the previous year's record-breaking results. Work accidents are currently tracked on the basis of lost time accident frequency (LTAF). In the future, however, tracking will more often be carried out on the total recordable injury frequency (TRIF) basis of accident frequency per million work hours, which includes accidents that result in time lost as well as cases where an employee is assigned to alternative work or requires medical care. Accidents involving external labour are also included in accident tracking. In 2017, four work accidents involving external labour and resulting in medical leave occurred at Tervasaari.

In compliance with its Biofore strategy, UPM is strongly committed to the responsible handling of matters relating to finance, people, society and the environment and to the continuous improvement of its operations at Tervasaari.



  
Pentti Putkinen,  
General Manager

  
Harri Hiltunen,  
Manager,  
UPM Environment & Responsibility

# Responsibility figures 2017

## Waste



0%

to landfill

## Taxes



The Tervasaari mill's effect on taxes in:

EUR **11.2** million

Real estate taxes EUR 0.4 million  
Estimated tax on salaries EUR 2.9 million  
Estimated corporate income tax EUR 7.9 million based on the number of employees\*

\* Approximately 30% of this goes to municipalities, which is split between each municipality according to their share of business activities and forests operations

## Consumption impact

Mill's consumption impact in region approx.

EUR **12.7** million

## Air



Decrease in fluidised bed boiler emissions after investment in scrubbers

SO<sub>2</sub> **75%** Particulates **99%**



## Energy

Share of biofuels

**51%**

of fuel used

## Water



Biological oxygen demand level entering water systems

**45%**

lower than in 2016

## Safety



Improvement in lost time accident frequency (LTAF) since 2008

62%

Number of safety observations and reports of dangerous situations filed by Tervasaari employees in 2017

1365



## Local cooperation

73

primary school pupils and supporters participated in the Local Waters project

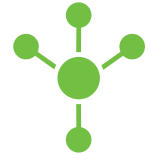
## Health



Amount contributed to employee exercise and culture programmes

EUR 45,000

## Supply chain



99%

of raw materials by value are sourced from suppliers who have accepted the UPM Supplier and Third-Party Code

## Employment



Indirect employment effect in region approx.

300 in-house employees

250 indirect employees

60 summer employees and interns

## Certified fibre



87%

of fibre used in paper production was FSC or PEFC certified

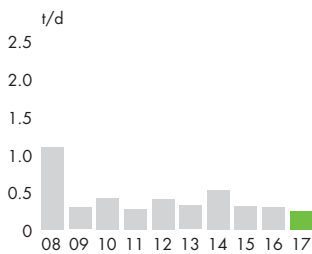
# Water

The volume of process wastewater treated at the Tervasaari effluent treatment plant decreased from the previous year. As was the case last year, a controlled stream of warm process water was directed to the mill's effluent treatment plant during the coldest time of the year to keep the temperature of the wastewater processed at the biological treatment plant at a sufficient level.

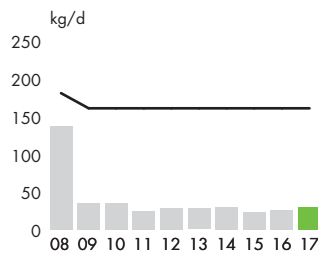
This is because production at the Billerud-Korsnäs paper machine ended in autumn 2016, leading to a change in the heat load and wastewater flows from the mill integrate. The warm process water directed to the treatment plant increased the volume of wastewater requiring treatment, which meant that the target established for the specific water consumption of production was not achieved.

However, it should be noted that effluent emissions remained well below the mill's permitted limits, as well as below the internal environmental targets set for effluent emissions for 2017.

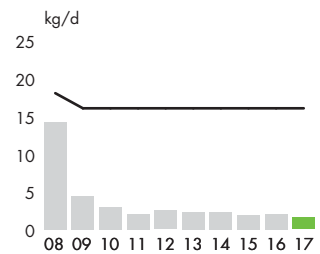
**Total suspended solids, TSS**



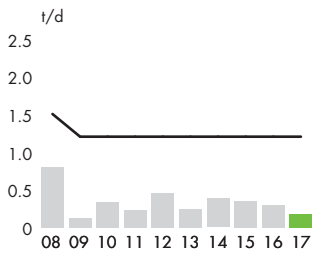
**Nitrogen, N**



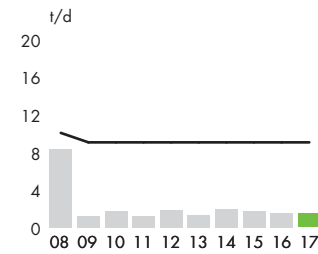
**Phosphorus, P**



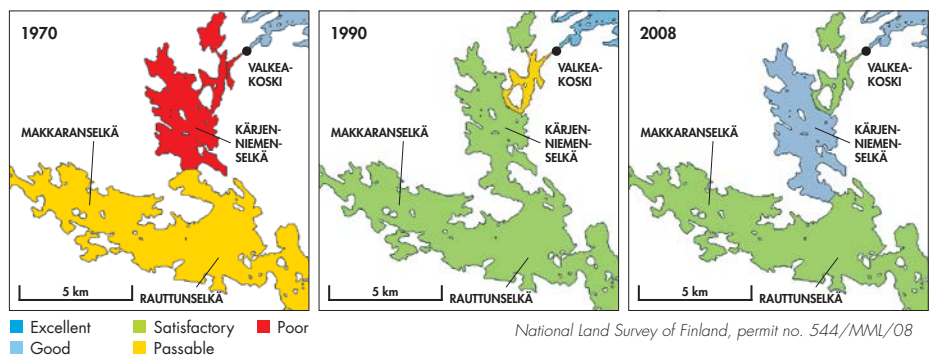
**Biological oxygen demand, BOD<sub>5</sub>**



**Chemical oxygen demand, COD**



Surface water quality classification for the years 1970, 1990 and 2008 based on samples taken and analysed by the Water Protection Association of the River Kokemäenjoki in the water bodies downstream of Valkeakoski.



# Air

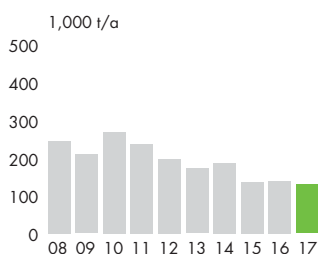


In recent years, industry in the Valkeakoski region has undergone dramatic changes that have resulted in a decrease in airborne emissions. Air quality monitoring in Valkeakoski was therefore discontinued as of 31 December 2015.

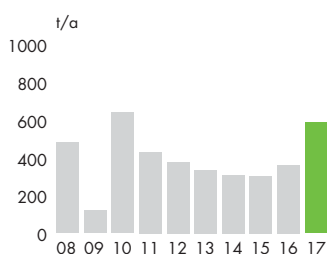
Airborne emissions from the Tervasaari mill remained below permitted limits

throughout the year. The fluidised bed boiler's flue gas purification unit, commissioned at the end of 2014, has helped to dramatically reduce the mill's SO<sub>2</sub> and particulate emissions. In 2017, NO<sub>x</sub> emissions from the fluidised bed boiler slightly exceeded internal airborne emissions targets due to technical combustion issues.

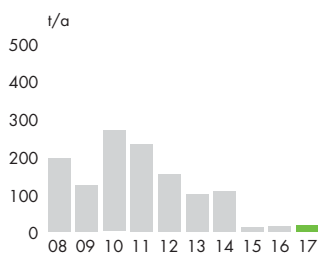
**Fossil carbon dioxide, CO<sub>2</sub>**



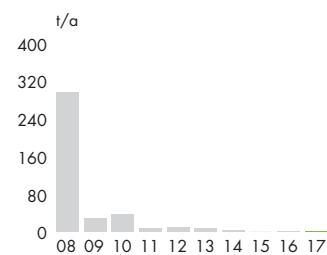
**Nitrogen oxides, NO<sub>x</sub>**



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



**Particulates**



# Waste



Tervasaari is actively involved in UPM's Zero Waste project. One of the project's aims is to eliminate all solid waste taken to landfill by 2018, by improving the sorting and recycling of waste. Tervasaari had already achieved this by the end of 2016. No waste was taken from Tervasaari to industrial landfills in 2017.

We have set ourselves the permanent goal of recovering all fractions from UPM Tervasaari and not taking any production waste to the Suikki landfill. In 2017, collaboration with various research institutes and actors continued in order to ensure the recovery of waste, and we aim to develop new methods to ensure the recovery of industrial by-products. However, if necessary the Suikki industrial landfill can continue to be used as an interim storage area for materials being directed to recovery.

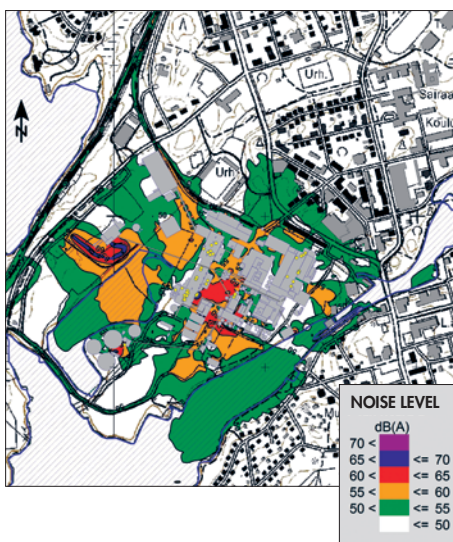
In 2017, fly ash and fluidised bed boiler bottom ash were used in the closure of UPM's Kalatonlahti landfill. We were able to keep the proportion of recovered waste at a high level through improved sorting. Essentially all waste produced in 2017 was recovered.

Leachates from the Kalatonlahti and Suikki landfills are processed at Tervasaari's biological effluent treatment plant.

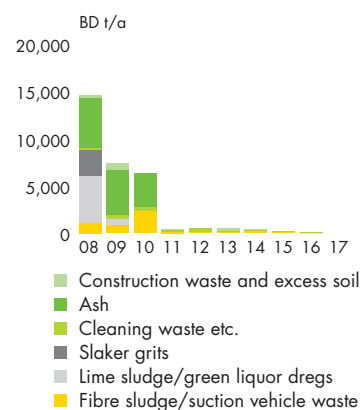
# Noise

The annual noise measurements required by the Tervasaari environmental permit were conducted in 2017. The results of the measurements have been reported to the environmental protection authorities of Valkeakoski and the Pirkanmaa Centre for Economic Development, Transport and the Environment.

Noise propagation was modelled using the Nordic noise prediction method for road, railway and industry noise and SoundPLAN software. The average day-period sound level (LAeq7-22) for the UPM Tervasaari mill in summer 2014 is indicative of the situation.



**Solid waste taken to landfill**





# Societal responsibility

Well-functioning dialogue with stakeholders is key to our success. Our most important stakeholder groups are our customers, employees and suppliers, officials and decision-makers, the media, non-governmental organisations and local communities.

We have an impact on the communities around us and on society in many ways. We are committed to promoting the vitality of the communities near our facilities through active collaboration and open dialogue with different stakeholders, as well as through sponsorships and donations. For UPM, social responsibility means that we are committed to responsible and ethical business practices wherever we operate.

Our economic impact is significant both locally and nationally, and we want to advance transparency on matters of taxation. UPM is committed not only to the payment of direct and indirect taxes and other fees as prescribed by law, but also to reporting and publishing its tax information according to current law

and the corporation's own transparency objectives.

## The Biofore Share and Care programme

UPM's Biofore Share and Care programme reflects our commitment to building a sustainable, innovation-driven future. We contribute our abilities and resources to benefit causes that we believe in. The programme's focus areas are: reading and learning, engaging with communities, responsible water use and boosting bio innovations.

UPM offers many kinds of support, depending on the nature of the project. We may provide monetary assistance to community projects, participate in the activities of organisations active in the local community, donate products or materials or participate in volunteer activities or fundraising. Our local collaborative projects are goal-driven and long-term, and take place in areas where UPM production facilities are located.

## The Local Waters project introduced school pupils to water monitoring

Tervasaari has been actively involved in UPM's Local Waters project, in which schools near UPM's Finnish mills had the opportunity to study and monitor local waters with donated instruments. Local Rotary clubs collaborated on this project by acting as links to the schools.

In 2017, a group of pupils from Valkeakoski were introduced to wastewater analysis in Tervasaari. The pupils also participated in the monitoring of water bodies and sampling carried out by the Water Protection Association of the River Kokemäenjoki (KVVY) on the shore of Lotilanjärvi lake.

As part of the Local Waters project, the pupils took samples of Lotilanjärvi lake.

## Responsible sourcing

UPM is committed to responsible sourcing throughout the supply chain. Close collaboration with our suppliers helps us ensure that our suppliers understand and meet our sustainability and responsibility requirements.

We require all suppliers to uphold the UPM Supplier and Third-Party Code, which lays out our minimum requirements for corporate responsibility relating to environmental impact, human rights, labour practices, occupational health and safety and product safety. The supplier Code of Conduct is supplemented by individualised regulations, guidelines and supplier requirements, such as the list of restricted chemicals in the pulp and paper business.

The environmental performance and social suitability of suppliers is monitored through regular data collection and analysis. Based on our risk analysis, we identify suppliers whose performance requires closer examination. If we detect inconsistencies with our requirements, the supplier must take corrective action. We actively track the outcome of these actions and use our capabilities to support our suppliers so that they can improve their performance.

## Safety

To UPM, the health and safety of employees, visitors and all other people affected by our operations are of paramount importance. Our aim is to be the industry leader in safety. Thanks to the company-wide Step Change in Safety initiative, UPM's work safety statistics have improved considerably.

All of our employees – as well as our partners and their employees – working at our premises are expected to follow the UPM safety rules and principles. All contractors working at UPM facilities must complete a work safety induction. UPM's Safety Induction gives an overview of the procedures by which contractors can ensure a safe work day at UPM.







### Learning new skills

During 2016 and 2017, a new operating model was adopted at Tervasaari. This led to new work tasks and areas of responsibility for approximately half of employees. Emphasis was placed on training for new skills and learning through doing. The employee survey carried out in September 2017 included questions about learning new skills:

I can use my skills and abilities in my work tasks ->  
81% agreed

My work offers me challenging and interesting tasks ->  
70% agreed

My direct supervisor supports my learning and development ->  
71% agreed

I have the necessary knowledge to do my work well ->  
80% agreed

### Summer and internship positions

The Tervasaari mill offers summer and internship positions to approximately 60 young people and students studying in the field each year. Feedback from these employees has been positive. They mentioned team spirit, the work environment, responsibility, work tasks and the opportunity to work in their own field as strengths. The feedback also revealed areas in need of improvement. Regularly collecting feedback allows us to improve the work experiences of young people and students.

### The forest industry's gift to Finland on the nation's centennial – the Bioaika truck – piqued interest in Valkeakoski

The forest sector's gift to Finland and its youth on the nation's centennial was the Bioaika series of events, organised in summer 2017. At the core of the programme was a science exhibit that travelled on wheels (and biofuel) throughout Finland: the Bioaika ("Bio Era") truck.

The Bioaika truck visited Valkeakoski in August. Experts from UPM Tervasaari, UPM Forest and the Water Protection Association of the River Kokemäenjoki were on hand to present their work in the context of the bioeconomy. The event attracted a lot of interested participants in the area, from families with children to pensioners.



### The Tervasaari mill fire service

The Tervasaari mill fire service boasts over one hundred years of fire safety and protection work and development in Valkeakoski.

In addition to fire safety, the Tervasaari mill fire service is currently active in many other safety service areas, such as ensuring safe work at heights, as well as training employees on different topics in workplace safety.

The mill fire service employees are professionals in different fields who are also qualified for fire service.

The Tervasaari mill fire service is a contracted fire service in the Pirkanmaa region and is therefore an integral part of the local fire and rescue services organisation. In 2017, the Tervasaari mill fire service moved into new, more suitable premises at the Tervasaari mill site, having previously been located away from the site.

# Environmental parameters 2017

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.

<b>Production capacity</b>	Paper	300,000 t
<b>Raw materials</b>	Pulp Chemicals	See UPM Corporate Environmental Statement for more information.
<b>Energy</b>	Biogenic and fossil fuels Purchased energy	Biogenic 51%, fossil 49 % See UPM Corporate Environmental Statement for more information.
<b>Emissions to air</b>	Particulates Sulphur dioxide, SO <sub>2</sub> Nitrogen oxides, NO <sub>x</sub> Carbon dioxide (fossil), CO <sub>2</sub>	0.4 t 18.2 t 459 t 130,000 t
<b>Water intake</b>	Process and cooling water	10,027,790 m <sup>3</sup>
<b>Discharges to water</b>	Clean cooling water Process effluent Biological Oxygen Demand, BOD <sub>7</sub> Chemical Oxygen Demand, COD <sub>Cr</sub> Total suspended solids, TSS Phosphorus, P Nitrogen, N	5,233,838 m <sup>3</sup> 5,067,820 m <sup>3</sup> 59.3 t 410.7 t 85.6 t 0.6 t 10.3 t
<b>Waste</b>	Landfill waste – Ash – Soil and rock – Demolition waste – Mixed waste (cleaning, gardening etc.) – Fibre sludge, suction vehicle waste, dry  Recovered waste – Metal waste etc. – Ash – Energy waste – Others  Interim storage – Fibre sludge  Hazardous waste	0 t 0 t 0 t 0 t 0 t  295.3 t 11,896 t 630.2 t 34 t  188.9 t  92.1 t
<b>Size of mill area</b>		73 ha



# Performance against targets in 2017

TARGETS	ACHIEVEMENT	COMMENTS
The most significant actions for improving safety and protecting the environment in 2017 were:		
<b>1 Preventing environmental non-compliances and achieving the Clean Run objectives:</b> COD < 1.9 t/d; BOD <sub>5</sub> < 0.4 t/d, N < 30 kg/d and P < 3 kg/d	Yes	The treatment plant has been reliable. Emissions have been controlled. No Clean Run non-compliances of class 3, 4, 5
<b>2 Airborne emissions; fluidised bed boiler</b> NO <sub>x</sub> < 200 mg/m <sup>3</sup> (n) SO <sub>2</sub> < 20 mg/m <sup>3</sup> (n) Particulates < 5 mg/m <sup>3</sup> (n)	No Yes Yes	NO <sub>x</sub> emissions slightly exceeded internal targets for airborne emissions due to technical combustion issues. Other airborne emissions were significantly lower than the established targets.
<b>3 Reducing water consumption, the loss of solids and the amount of solid waste:</b> Water consumption 9.5 m <sup>3</sup> /t Solids losses 0.45% Improving the sorting of waste to be incinerated Zero t/a of taxable waste taken to landfill	No No Yes	Specific wastewater consumption and solids losses were on average higher than the target. Sorting of the waste fractions produced by the mill was improved and no waste was taken to landfill.
<b>4 Increasing opportunities for ash recovery</b> Aim to recover 100% of fly ash and initiating the recycling of bottom ash Participation in one or more ash recovery projects	Yes	Fly ash was recovered according to plan.
<b>5 Improving energy efficiency:</b> Reduction in the use of natural gas: 100,000 MWh compared to 2016 levels	No	The goal of reducing the use of natural gas in energy production was not achieved due to technical issues with the fluidised bed boiler and a shortage of solid fuel, as well as the steady operation of the paper machines.

# Targets for 2018

TARGETS
<b>1 Preventing environmental non-compliances and achieving the Clean Run objectives:</b> COD < 1.7 t/d; BOD <sub>5</sub> < 0.3 t/d, N < 29 kg/d and P < 2.5 kg/d
<b>2 Airborne emissions; fluidised bed boiler</b> NO <sub>x</sub> < 200 mg/m <sup>3</sup> (n) SO <sub>2</sub> < 20 mg/m <sup>3</sup> (n) Particulates < 5 mg/m <sup>3</sup> (n)
<b>3 Reducing water consumption, the loss of solids and the amount of solid waste</b> Water consumption 8.2 m <sup>3</sup> /t Solids losses 0.62% Improving the sorting of waste to be incinerated Zero t/a of taxable waste taken to landfill
<b>4 Increasing opportunities for recovery of ash</b> Aim to recover 100% of fly ash Participation in at least one Tuhkatie project or other ash recovery project.
<b>5 Improving energy efficiency:</b> Improving the quality of fuel by increasing the burning of recycled wood by 20,000 MWh compared to 2017 levels



## Revalidation Statement

As an accredited environmental verifier (FI-V0001), Inspecta Sertifiointi Oy has examined the environmental management system and updated UPM Tervasaari Environmental and Societal Responsibility 2017 report as well as the information concerning UPM Tervasaari in the Updated UPM Corporate Environmental Statement 2017.

On the basis of this examination, the environmental verifier has herewith confirmed on 2018-04-06 that the environmental management system, the updated UPM Tervasaari Environmental and Societal Responsibility report and the information concerning UPM Tervasaari in the Updated UPM Corporate Environmental Statement are in compliance with the requirements of the EMAS Regulation (EC) No 1221/2009.



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

**UPM Tervasaari**

P.O. Box 39  
FI-37601 Valkeakoski, Finland  
Tel. +358 (0)2041 6111  
Fax +358 2041 62369

**Further information**

Harri Hiltunen  
Manager, UPM Environment &  
Responsibility  
Tel. +358 (0)2041 62643  
[harri.o.hiltunen@upm.com](mailto:harri.o.hiltunen@upm.com)