

UPM Pietarsaari

Environmental and Societal Responsibility 2017



UPM Pietarsaari

The UPM Pietarsaari integrate consists of the Pietarsaari pulp mill, the Alholma sawmill and the UPM Forest Ostrobothnia integrate region. The mills are located in the UPM industrial estate in Alholma, Finland, together with BillerudKorsnäs Finland, Walki and Alholmens Kraft.

UPM Forest is responsible for procuring wood for the pulp mill and sawmill, and for their on-site measurement. Logs are sawn at the Alholma sawmill and pulpwood, cuttings and wood chips are pulped. A portion of the pulp is delivered to the BillerudKorsnäs paper mill for kraft paper manufacturing. The Walki factory further processes some of the kraft paper to make different packaging materials. Bark and other wood residues are used by the Alholmens Kraft power plant to generate electricity, steam and district heating.

This Environmental and Societal Responsibility report covers the UPM Pietarsaari pulp mill and the Alholma sawmill. Forest responsibilities are covered in the UPM Forest report.



UPM Pietarsaari 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) 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

	Pulp mill	Alholma sawmill
Production capacity	825,000 t	280,000 m ³
Employees	303 and 5 for functions	63
Products	UPM Conifer UPM Conifer TCF UPM Conifer Thin UPM Betula UPM Betula TCF	Pine and spruce timber
Residues	Thermal energy, electricity, tall oil and turpentine	Woodchips, sawdust and bark
Certificates	EMAS EU Eco-Management and Audit Scheme ISO 14001 – Environmental Management System ETJ+ – Energy Efficiency System ISO 9001 – Quality 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	EU Ecolabel	



For more information about FSC products, please visit www.fsc.org



Alholma sawmill

For more information about PEFC products, please visit www.pefc.org

Review of the year 2017

Pulp mill

The year was favourable for the pulp mill in both production and finances. The mill reached a new annual production record and pulp was in demand. A central long-term environmental objective for the mill is to increase production volumes without adding environmental load. An excellent level of cleaning efficiency was reached, thanks to optimised running of the water treatment plant. The plant is stable in operation and is not sensitive to variation in waste water loads.

Compared to 2016, the waste water discharge amounts from the industrial estate remained the same, but nitrogen amounts were reduced, even though production increased slightly. Converted to specific emissions, the effluent released into the sea was clearly at the BAT level (BAT ref. 2014). Airborne emissions were in line with previous years. Calculated as specific emissions, airborne emissions were clearly at the BAT level (BAT ref. 2014).

One hundred and eight environmental observations were logged at the pulp mill, all of which were dealt with and remedied over the course of the year. The number increased slightly from the previous year. Deviations are classified on a scale of one to five. In 2017, one class-three deviation in excess of the permitted conditions was logged when one daily particle limit was exceeded at the mill's recovery boiler.

The optimisation of the water treatment plant's operation continued. Optimisation of the nutrient feed reduced the operations' nutrient emissions compared to the previous year. Solid waste was successfully utilised. The second stage of closing the north section of the landfill was carried out according to plan. Over 18,000 tonnes of ash were used to shape the landfill and stabilise green liquor dregs. Previously stored organic matter and dredging spoils were used in the soil layer.

Around 200 wet tonnes of green liquor dregs were also utilised. UPM has set a target for no solid waste to be sent to landfill or burnt without energy recovery after 2030. The work to promote a circular economy continues, and the aim is to reintroduce operational sidestreams into the material cycle.

The mill received 11 environmental contacts over the course of the year, mostly concerning noise and odour nuisances. The number decreased compared to the previous year.

In 2017, the mill received its new environmental permit decision. The mill's internal environmental targets and monitoring plans will be updated to match.

Alholma sawmill

The Alholma sawmill's objective of maximum operation was achieved. The mill's energy efficiency improved on that of previous years, as the consumption

of electricity and heat per cubic metre of sawn timber produced was reduced. The amount of waste produced per cubic metre of sawn timber was also reduced compared with the previous year. There were no environmental deviations or complaints in 2017. The sawmill received a new environmental permit.

Local cooperation

UPM is committed to promoting the vitality of local communities through active cooperation and open dialogue with different stakeholders, as well as through sponsorships and donations. In 2017, several visits to the industrial estate were arranged for forest owners, students and other stakeholders. We also reached out to schoolchildren and students, for example, by holding a Bioage event at the Oxhamn school, arranging forest excursions for grade-5 and grade-6 pupils (aged 11 to 13 years) and running the Forest Ambassador campaign. Sponsorships and donations were primarily targeted at local community well-being, children and young people.



Kari Saari
Environmental Manager



Veikko Petäjästö
Director, Integrate and Pulp Mill



Mika Åby
Director, Alholma Sawmill

Responsibility figures 2017

Waste



Proportion of recyclable waste at the pulp mill and sawmill

56%

Water



Waste water chemical oxygen demand (COD_{cr})

29%

lower than in 2008

Phosphorus load (P_{tot})

53%

lower than in 2008

Certified wood



Proportion of certified wood in pulp production

86%

Air



Fossil carbon dioxide emissions reduced

81%

per tonne of pulp produced compared to 2008

Energy



Proportion of renewable fuels in energy generation over

99%

Taxes



Impact on taxes approx

EUR **13.4** million

(incl. UPM Alholma sawmill and UPM Forest)

Property taxes EUR 0.5 million

Estimated local income tax from personnel wages EUR 3.1 million

Estimated corporate income tax EUR 9.8 million based on the number of employees*

*Municipalities receive approximately 30% of this amount, which is further allocated to each municipality according to its business activity factor and forest factor.

Safety



Our personnel were responsible for

445 safety walks

953 safety observations

in 2017



Local cooperation

74 summer employees

in 2017

13 students

graduated from the pulp mill apprenticeship programme as processing industry professionals

294 forest owners

visited the Pietarsaari mill integrate

Supply chain



93%

of the value of raw materials comes from suppliers, excluding wood suppliers, who have approved the UPM Supplier and Third-Party Code

Employment



Indirect employment effect in region approx.

360 persons

Consumption impact



Mill integrate's consumption in region approx.

EUR **15** million

in Finland approx.

EUR **28** million



As in previous years, the pulp mill had an excess of electricity generation due solely to the energy recovered from the burning of black liquor. The excess electricity was sold back to the grid through UPM Energy.

The pulp mill and sawmill delivered bark and wood residues from the debarking of logs and pulpwood to Alholmens Kraft for use as fuel. Measured by their specific emission factors, airborne emissions were at a good BAT level. The specific emissions fell below the permit conditions. Airborne emissions were in line with previous years. The emissions of acidifying gases (SO₂ + NO_x) decreased slightly compared to the previous year. The mill ramp-ups and shutdowns related to planned and unplanned stoppages caused some odour nuisances in the vicinity of the mill. No permit conditions were exceeded in normal operation. The recovery boiler exceeded the daily particle limit on one day due to equipment breaking down.

A long-term objective of the pulp mill is to become a carbon-neutral mill. Accordingly, direct and indirect fossil CO₂ emissions have been systematically reduced at the mill. The objective is in line with the group's responsibility targets for 2030.

The portion of biofuels in pulp production remained high at 99.7%. In pulp production, the fossil CO₂ emissions per tonne produced were reduced slightly and remained below the target level. Fossil CO₂ emissions per pulp tonne produced were reduced by 81% compared to the starting level in 2008.

A landfill gas collection and processing system was built with a view to closing the landfill's north section. The system will oxidise the methane in landfill gas into carbon dioxide. Based on the landfill gas yield measurements, it is estimated that the processing system will result in an annual greenhouse gas reduction equivalent to 2,500 to 3,700 tonnes of annual fossil CO₂ emissions.

The electrification of the industrial estate's train track was completed in March 2017. The track's electrification allowed diesel engines to be replaced with electric ones. This change resulted in an annual reduction of between 650 and 2,050 tonnes of CO₂ emissions,

depending on the annual amount and travel time of transportation, as well as the emission factor used.

The burning of odorous gases in the recovery boiler continued to be successful with a good time-benefit ratio.

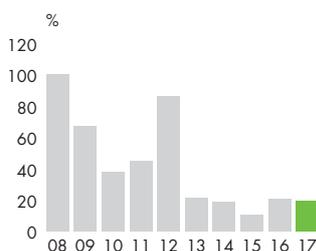
AIRBORNE EMISSIONS FROM PULP PRODUCTION IN 2017

	Solids t/a	Sulphur dioxide t SO ₂ /a	TRS t S/a	Nitrogen oxides t NO _x /a	Chlorine compounds t Cl/a
Recovery boiler	109	10	11	1,052	
Lime-sludge kiln	12	2	1	57	
Odorous gas emergency burner (flare)		21			
Bleaching 1					3.7
Bleaching 2					0.1
Fugitive emissions			11		
Total	121	33	23	1,109	3.8

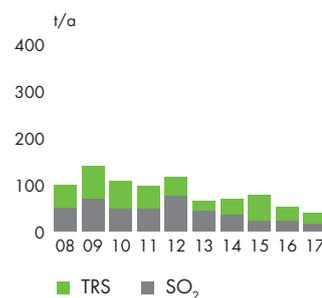
ODOROUS GAS DISPOSAL, % of time

	2015	2016	2017
Burnt in the recovery boiler	98.8	98.6	99.0
Burnt in the emergency burner (flare)	0.9	1.0	0.7
Bypass to the smokestack	0.3	0.4	0.3

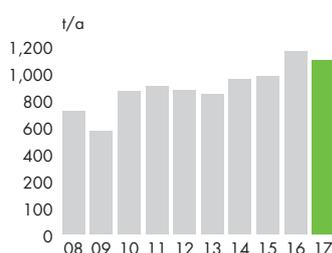
Development of the fossil CO₂ specific emissions at the Pietarsaari mill (2008 = 100)



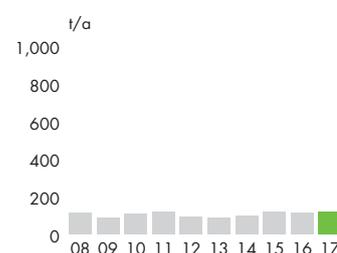
Gaseous sulphur compounds



Nitrogen oxides, NO_x



Particulates





Raw water supply

Lake Luodonjärvi is used to provide raw water for the UPM Pietarsaari mill. In 2017, the pulp mill and sawmill consumed a total of 61,337,884 m³ of raw water. Less than half of the raw water was used for cooling and the rest was used as process water for the pulp mill. The Alholma sawmill consumed around 35,000 m³, less than 0.1% of the total.

Effluent released into the sea

Internal targets were set in 2014 for the pulp mill's effluent load to ensure the continuous improvement of operations. The internal targets will be updated in 2018 as a result of the new environmental permit decision.

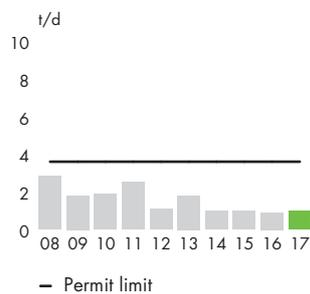
The permit-regulated waste water emissions stayed almost identical to the previous year, even though production increased slightly. In 2017, all waste water emissions were clearly under their respective limits.

Optimisation of the waste water treatment plant kept the nutrient emissions of nitrogen and phosphorus below the target level. The eutrophication of the immediate sea area in Pietarsaari is sensitive to phosphorus, which is why particular effort was made to reduce phosphorus effluent without affecting the efficiency of waste water treatment. Compared to the 2008 reference level, the phosphorus effluent per tonne of pulp produced has been reduced by 59.1%. AOX amounts exceeded their target level due to the change in the operational model of the bleaching plant. The waste water chemical oxygen demand (COD_C) slightly exceeded the target level. Furthermore, the COD of the pulp mill per tonne of pulp produced was reduced by 28.3% compared to the 2008 reference level. The target for 2030 is to reduce the figure by 40%. The target level for total waste water discharge was exceeded due to a greater-than-estimated cooling water discharge.

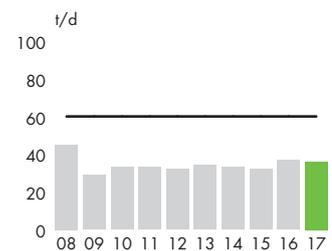
TOTAL LOAD COMPARED TO PERMIT CONDITIONS 2017

	Annual average compared to permit conditions 2017	Target (pulp mill's portion) 2017	Permit condition, annual average
COD, t/d	36	35	60
BOD ₇ , t/d	1,0	1.0	3.6
Nitrogen, kg/d	250	400	700
Phosphorus, kg/d	23	35	55
AOX, t/d	0.24	0.20	0.5
Solids, t/d	1.0	1.5	No permit conditions

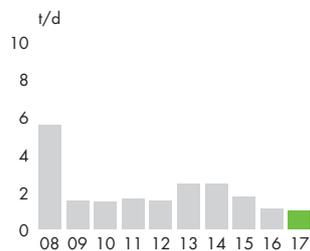
Biological oxygen demand, BOD₇



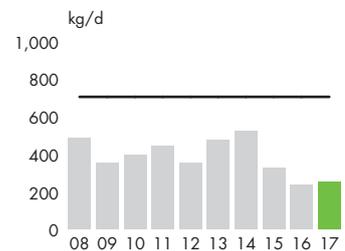
Chemical oxygen demand, COD



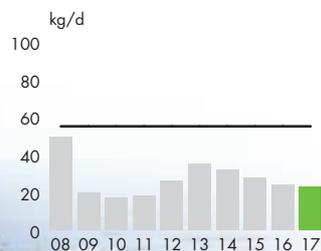
Total suspended solids, TSS



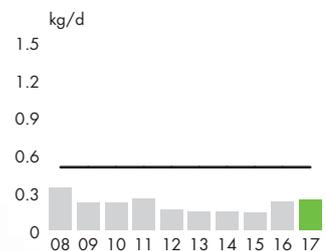
Nitrogen, N



Phosphorus, P



Adsorbable organic halogen compounds, AOX



— Permit limit

Waste



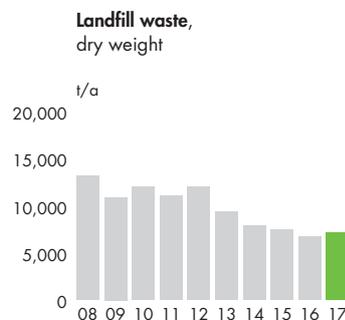
The UPM Pietarsaari landfill is located on the industrial estate. In 2017, 17,601 tonnes of solid waste were generated. This was 500 tonnes less than in the previous year. 55.5% of the waste generated in 2017 was utilised over the course of the year.

Of the 7,135 tonnes of waste placed in the landfill, more than 99% was green liquor dregs from the chemical cycle of pulp. Compared to the previous year, landfill dumping increased by 392 tonnes due to increased production. The work to utilise green liquor dregs continues. One circular economy objective is to utilise all sidestreams and stop the generation of landfill waste by the end of 2030. The amount of landfill waste generated per tonne of pulp produced has been reduced by 52.2% from the 2008 reference level.

Waste components weighing 693 tonnes were placed in intermediate storage for later use. All waste amounts are stated in dry matter tonnes.

Of the 59.4 tonnes of hazardous waste delivered elsewhere for processing, 44.6 tonnes (waste oils, lubricants etc.) were channelled for reuse.

The second stage of closing the north section of the landfill was completed in 2017. A total of 17,253 tonnes of waste components were utilised, some of them previously stored and some excavated from the landfill's bank. In addition, 9,158 tonnes of fly ash from Alholmens Kraft Ab were used to stabilise green liquor dregs and 9,339 tonnes of bottom ash were used to seat the confining bed.



SOLID WASTE (dry weight, t/a)

	Land-fill	Intermediate storage	Utilised
Lime and lime mud		382	1,002
Green liquor dregs	7,067		86
Branch rejects			1,284
Debarking reject sand			389
Wood and bark residue			1,002
Energy waste			76
Sludge		3	4,939
Cable and metal waste			637
Cleaning waste			42
Construction waste and soil	68	308	316
Ashes*			18,497
Total solid waste in 2017	7,135	693	9,773
Total solid waste in 2016	6,746	4,461	7,486

* Oy Alholmens Kraft Ab fly and bottom ash

Societal responsibility

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

Local cooperation in many forms

We affect the communities and societies around us 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. Support is primarily targeted at local community well-being, children and young people. We ran 37 different sponsorships over the course of the year, most of them for local sports clubs. We also made donations, such as donating lumber for the construction of the accessible nature trail in Fäböda in Pietarsaari.

We invest in the future by actively collaborating with local educational institutions. Our aim is to inform young people about jobs in our field and to encourage them to study and pursue careers in the forest industry. In 2017, we offered summer positions for 74 students and 7 apprenticeships. Five students completed their diploma work with us. Thirteen students graduated from the pulp mill's two-year processing industry apprenticeship programme.



One hundred and twelve schoolchildren and students visited the mill integrate over the course of the year. We also reached out to schoolchildren through the Bioage event held at the Oxhamn school. The core of the event was the Bioage Truck, a mobile scientific exhibition on bioeconomy. Students from the schools in Pietarsaari participated in forestry excursions held in cooperation with the Finnish Forest Association in September. We also participated in the Finnish Forest Industries Federation's forest ambassador campaign, which was designed to inform pupils in grades 7 to 9 (13 to 16 years of age) about the forest industry and the job opportunities it provides.

We prioritise maintaining dialogue with forest owners. Over the course of the year, we held several forest customer visits to our industrial estate, hosting a total of 294 forest owners.

Local impact on taxes

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. Our local impact on taxes in the Pietarsaari region is approximately EUR 13.4 million. This includes real estate tax, estimated local income tax from personnel wages and estimated corporate income tax.

Focus on safety at work

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.

Pre-emptive safety is a particular focus. In 2017, our employees were responsible for 445 safety walks and 953 safety observations at the pulp mill and the sawmill. All observations were dealt with and corrective measures were taken as necessary.

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.

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 non-compliance with our requirements, we demand corrective action from the supplier. We actively track the outcome of these actions and use our capabilities to support our suppliers so that they can improve their performance.

93% of the value of raw materials (excluding wood) come from suppliers who have approved the UPM Supplier and Third-Party Code.

Vegetation mapping at the industrial estate



The vegetation of the UPM Pietarsaari industrial estate was studied in 2016 and 2017 in cooperation with the University of Helsinki Faculty of Biological and Environmental Sciences and voluntary experts. The following species were discovered as new in the region of Ostrobothnia: the narrow-leaved everlasting pea, milk vetch and a cross between pale toadflax and common toadflax. Other rarities included the peach-leaved bellflower, common valerian, Yorkshire fog and white wood-rush.

Environmental parameters 2017

The table's environmental indicators are based on the total production of pulp at the UPM Pietarsaari pulp mill and sawn timber at the Alholma sawmill. The figures related to production as well as raw material and energy consumption are published as aggregated figures at group level in the UPM Corporate Environmental Statement 2017. The figures in the table are comparable with years 2013–2016. The figures prior to 2013 include sawmill figures.

Production capacity	Sawn timber	280,000 m ³
	Pulp	825,000 Adt
Raw materials and chemicals	Wood	See UPM Corporate Environmental Statement for more information
	Pulping and bleaching chemicals	
	Others	
Energy	Biofuels and fossil fuels	Biofuels 99.69% Fossil fuels 0.31%
	Purchased energy	See UPM Corporate Environmental Statement for more information
Emissions to air	Particulates	121 t
	Sulphur dioxide, SO ₂	33 t
	Odorous sulphur compounds, TRS (S)	23 t
	Nitrogen oxides, NO ₂	1,109 t
	Carbon dioxide, CO ₂ (fossil)	6,631 t
Water intake	Process and cooling water	61,337,884 m ³
	– sawmill	35,000 m ³
Discharges to the sea	Cooling and drainage water	27,677,646 m ³
	Cleaned waste water	31,524,752 m ³
	Biological oxygen demand, BOD ₇	369 t
	Chemical oxygen demand, COD _{Cr}	13,138 t
	Total suspended solids, TSS	350 t
	Total phosphorus, P _{tot}	8 t
	Total nitrogen, N _{tot}	73 t
	Adsorbable organic halogen compounds, AOX	87 t
Waste	Total landfill waste (abs. dry)	
	– Green liquor dregs	7,067 t
	– Construction waste and soil	68 t
	– Other waste	0 t
	– Total	7,135 t
	Utilised recyclable waste	
	– Lime	1,002 t
	– Green liquor dregs	86 t
	– Metal waste	637 t
	– Debarking reject sand	389 t
	– Wood and bark residue	2,328 t
	– Fibre sludge	4,939 t
	– Energy waste	76 t
	– Construction waste and soil	316 t
	– Total	9,773 t
	Waste intended for reuse	
	– Branch rejects	0 t
	– Lime	382 t
	– Asphalt	308 t
	– Wood and bark residue	0 t
	– Construction waste and soil	0 t
	– Sludge	3 t
	– Debarking reject sand	0 t
	– Total	693 t
	Hazardous waste	59.4 t
Size of mill area		210 ha



Performance against targets in 2017

TARGET	ACHIEVEMENT	COMMENTS
Clean Run environmental observations, class 3–5 deviations: zero.	No	The recovery boiler exceeded the daily particle limit on one day due to equipment breaking down.
Reduction of landfill waste	Partly	The amount of waste increased due to increased pulp production. The waste in intermediate storage from previous years was utilised in full. No organic waste was placed in the landfill.
The energy conservation agreement development programme's execution	Yes	Like in previous years, the pulp mill had an excess of electricity.

Targets for 2018

TARGET	
Pulp mill	Clean Run environmental observations, class 3–5 deviations: zero.
	Reduction of landfill waste – The study of solid waste utilisation continues. – Emphasis on the utilisation of green liquor dregs.
	The energy conservation agreement development programme is still under way.
	Update the monitoring plan and environmental targets.
Alholma sawmill	Use of ecolabelled timber (FSC & PEFC) in sales with maximum profitability.
	More effective waste sorting, waste amount reduction.
	Harmonisation of waste sorting instructions and waste containers in the estate of the Pietarsaari integrate.
	Reduction of energy (electricity and heat) consumption.



Revalidation statement

As an accredited environmental verifier (FI-V-0001), Inspecta Sertifiointi Oy has examined the environmental management system and updated UPM Pietarsaari Environmental and Societal Responsibility 2017 report as well as the information concerning UPM Pietarsaari in the Updated UPM Corporate Environmental Statement 2017.

On the basis of this examination, the environmental verifier has herewith confirmed on 2018-03-26 that the environmental management system, the updated UPM Pietarsaari Environmental and Societal Responsibility report and the information concerning UPM Pietarsaari in the Updated UPM Corporate Environmental Statement are in compliance with the requirements of the EMAS Regulation (EC) No 1221/2009.



www.upm.com

UPM Pietarsaari

P.O. Box 42
FI-68601 Pietarsaari
Finland

Further information:

Kari Saari
Environmental Manager
Tel. +358 (0)2041 69770
kari.saari@upm.com