UPM BIOFORE
BEYOND FOSSILS

UPM Pietarsaari

ENVIRONMENTAL AND SOCIAL RESPONSIBILITY 2022

UPM Pietarsaari

The UPM's Pietarsaari mill complex consists of the Pietarsaari pulp mill, the Alholma sawmill and UPM Forest Northern Region office. The mills are located on UPM's industrial estate in Alholma, together with Billerud, Walki and Alholmens Kraft.

The mill site is a diverse concentration of the bioforestry industry. At the site, wood from nearby areas is processed into pulp, sawn timber, paper, processed paper products and energy. UPM Forest is responsible for the procurement of wood for the pulp mill and sawmill. The logs are sawn at the Alholma sawmill, and pulp is made from pulpwood, sawdust and wood chips. A part of the pulp is delivered to the Billerud paper mill for kraft paper manufacturing. The Walki factory 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 EMAS report covers environmental matters pertaining to UPM's Pietarsaari pulp mill and the Alholma sawmill. Social responsibility is addressed with regard to the entire mill complex.

	Pulp mill		Alholma sawmill
Production capacity	800,000 t		280,000 m^3
Personnel	250		78
Products	**Softwood pulps:**	UPM Conifer UPM Conifer Thin	pine and spruce sawn timber, woodchips, sawdust and bark
	Birch pulps:	UPM Betula UPM Betula TCF	
	Eucalyptus cellulose:	UPM Euca	
By-products	Lime sludge calcium and green liquor dregs		
Residues	Tall oil and turpentine		
Bioenergy	Heat energy and electricity		
Certificates	EMAS (EU Eco-Management and Audit Scheme) ISO 14001 – Environmental Management System ISO 50001 – Energy Management System ISO 9001 – Quality Management System ISO 22000 – Food Safety Management System ISO 45001 – Occupational Health and Safety System PEFC, Programme for the Endorsement of Forest Certification FSC® wood origin monitoring system – Forest Stewardship Council® The certificates can be found with the Certificate Finder tool at www.upm.com/responsibility		
Environmental labels	EU Ecolabel Blue Angel Nordic Ecolabel UPM pulp products have the approval for use in EU Ecolabel and Nordic Ecolabel paper.		

UPM Pietarsaari Environmental and Societal Responsibility 2022 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 2022. 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 2024.

UPM delivers renewable and responsible solutions and innovates for a future beyond fossils across six business areas: UPM Fibres, 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 17,200 people worldwide and our annual sales are approximately EUR 11.7 billion. Our shares are listed on Nasdaq Helsinki Ltd. UPM Biofore – Beyond fossils. www.upm.com

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Review of year 2022

Pulp mill
2022 was a challenging year for the pulp mill in terms of production. Early in the year, a strike by the paper industry union and a planned annual shutdown of the mill weighed on production. There were no safety incidents in production, and the quality of pulp remained at an optimal level thanks to the modernised birch line in 2021.

Obligations related to environmental protection have been taken care of systematically and in accordance with the environmental permit. A key long-term goal for the pulp mill is to increase production without causing adverse environmental impacts. New production equipment, such as new washers for the birch line, has also allowed maintaining production with less environmental impact and reducing water consumption in the long term. Calculated as specific emissions, emissions into the sea and emissions into atmosphere were clearly in line with the BAT level (BAT ref. 2014). The fossil carbon dioxide emissions at the Pietarsaari pulp mill are still among the lowest in Europe.

55 environmental observations related to preventative environmental safety were recorded at the pulp mill. The monthly permit threshold was exceeded once during the year for the solid emissions. However, this did not cause any environmental damage, as the emission was contained in the plant's own backfilling ponds and was not reflected in water pollution. Work on the recovery of solid waste has continued actively in the UPM Group. UPM has set a target for no process waste to be taken to the landfill or burnt without energy recovery after 2030. The work to promote a circular economy continues, and the objective is to reintroduce sidestreams from operations into the material cycle.

In June, a new LNG ship using liquefied natural gas (LNG) or marine fuel was commissioned to transport pulp by sea. Modern ship technology will measure emissions, reduce fuel consumption, make crew work easier and increase safety. In addition, UPM gave a commitment to the Baltic Sea Action Group for the recovery and treatment of sanitary water from UPM's new cargo vessels.

Alholma sawmill
The year 2022 at the Alholma sawmill went well, both in terms of production and environment. Production efficiency was at a strong level, and production records were set in the sawmill and levelling plant. A two-week summer shutdown was held in July, when machinery was serviced and minor investment work was carried out. In 2022, the sawmills switched to recyclable protective plastic.

Energy efficiency studies were carried out for the Alholma sawmill and the Timber business as a whole, which will result in measures for the coming years. Energy efficiency improved at the Alholma sawmill and across the Timber business in 2022 compared to 2021. The sawmill did not receive any environmental feedback or reports on deviations from external stakeholders.

Safety as part of professionalism
Safety is an integral part of our everyday actions and expertise. We strive to reduce and prevent accidents through continuous improvements, effective risk management and preventative safety work. In 2022, the employees of the pulp mill and sawmill were responsible for 1,410 safety walks and discussions and 1,484 safety observations and incident reports. The annual maintenance shutdown of the pulp mill went smoothly and without any accidents.

Local collaboration in many forms
We are committed to developing the vitality of the local community through active cooperation and open dialogue with different stakeholders, and by supporting projects through sponsorship. In 2022, our sponsorship was mainly focused on supporting local sports and physical education activities, as well as education in maths and science. We also built an observation tower in Fäboda in cooperation with the city of Pietarsaari.



Tomi Heikkinen
Environmental Manager

Simon Fagerudd
General Manager of the Integrated Unit and Pulp Mill

Mika Åby
Director, Alholma Sawmill

UPM Pietarsaari

Contribution to UN Sustainable Development Goals in 2022

Waste and by-products

26%

of the waste generated by the pulp mill and sawmill during the year was transferred to intermediate storage or directly recovered.

Safety

The employees of the pulp mill and sawmill carried out

1,410

safety rounds and discussions and made

1,484

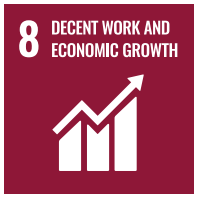
safety observations and hazardous situation reports

Air

Particle emissions have decreased by

14.7%

per tonne of pulp produced since 2013.

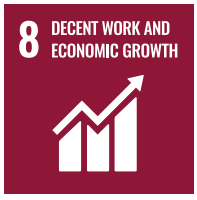


Employment

UPM Pietarsaari directly employed

343

persons



Health

The amount spent on the wellbeing of pulp mill and sawmill employees was

approx. EUR 115,000

Energy

The share of renewable fuels in pulp production was once again maintained at a high level of

98.3%

Supply Chain

85%

of the value of raw material procurements from suppliers committed to UPM's Code of Conduct for Suppliers and Third Parties (excluding wood)

Water

Emission (BOD_7) causing biological oxygen demand in the water body has decreased by

46%

nitrogen emissions by

15%

and solid emissions by

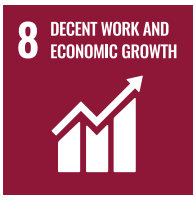
26%

per tonne of pulp produced since 2013.

Water consumption per tonne of pulp produced has decreased by

16%

since 2013.



Taxes

Local tax impact of the mill complex was approximately

EUR 17 million

Property taxes: EUR 0.6 million

Estimated municipal taxes on personnel salaries: EUR 2.7 million

Estimated corporate tax of approximately based on the number of employees*

*share for all the municipalities approx. 30%. Each municipality receives a share of this depending on the ratios calculated based on business and forest operations in the municipality.

Certified Fibre

78%

PEFC and/or FSC certified fibre in pulp production. UPM's goal is that all the fibre used is certified by 2030.

Air

As in previous years, the pulp mill was powered solely by the energy generated by the combustion of black liquor, the process liquor from the pulp cooking process. The excess electricity was sold to the electrical grid through UPM Energy. The pulp mill and sawmill supplied bark and wood-based residues obtained from the debarking of logs and pulpwood to the Alholmens Kraft power plant on the mill site as fuel. Alholmens Kraft produces steam for the pulp mill, district heat for the city of Pietarsaari and electricity for the national grid.

Measured by specific emission factors, the pulp mill's airborne emissions were within BAT levels. All emission parameters remained below permit regulations. The ramp-up and shutdown situations of the mill related to planned and unplanned stoppages caused some odour issues in the vicinity of the mill. The pulp mill's long-term objective is to become a carbon dioxide-neutral pulp mill. In line with the target, the plant has systematically reduced direct and indirect fossil carbon dioxide emissions by using fossil fuels only during production start-ups, shutdowns and incidents. The objective is in line with the Group's responsibility targets for 2030. The proportion of renewable fuels in pulp production was again maintained at a high level of 98.3%. The pulp mill's particulate emissions per tonne of pulp produced were reduced by 14.7% from 2013 levels by 2022. The burning of odorous gas in the recovery boiler and the backup burner was successful during the year, with an efficiency of 98.3%.

During the year, fossil fuels had to be used as a back-up burner due to production disruptions at the recovery boiler and during the pulp mill overloads. In addition, due to fuel shortages, the renewable pitch oil pitch has occasionally had to be replaced with fossil fuel oil.

The increase in gaseous sulphur compounds is due to production failures in the recovery boiler, which have forced the combustion of concentrated odour gases in a back-up burner to reduce odour emissions.

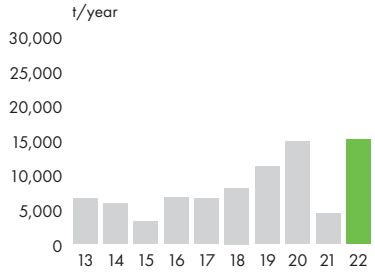
EMISSIONS INTO THE AIR FROM PULP PRODUCTION IN 2022

	Particulates t/year	Sulphur dioxide t SO_2/year	TRS t S/year	Nitrogen oxides t NO_2/year	Chlorine-compounds t Cl/year
Recovery boiler	43	5	3.7	529	
Lime kiln	2	2	0.01	32	
Reserve boiler		141			
Bleaching 1					1.4
Bleaching 2					0.0
Fugitive emissions			27.1		
Total	45	148	31	561	1.4

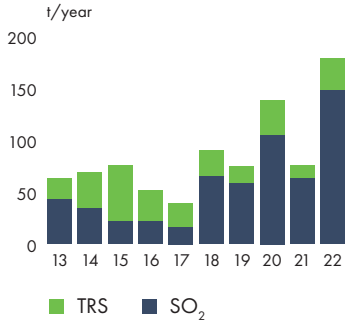
ODOROUS GAS ERADICATION, % of time

	2019	2020	2021	2022
Burnt in the recovery boiler	99	96.9	97.9	93.3
Burnt in the back-up burner (flare)	0.9	2.2	1.0	5
Bypassed into the flue	0.1	0.9	1.1	1.7

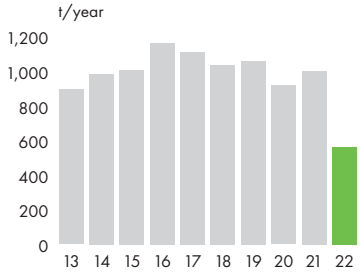
Development of fossil carbon dioxide emissions at the Pietarsaari mill



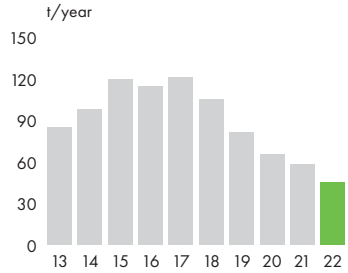
Gaseous sulphur compounds



Nitrogen oxides, NO_2



Particulates



Water

The pulp mill uses water from Lake Luodonjärvi in its production. About half of this is used as cooling water and the rest as process water. The Alholma sawmill accounts for less than < 0.1% of total water consumption. Water consumption per tonne of pulp produced has decreased by 16% compared to 2013.

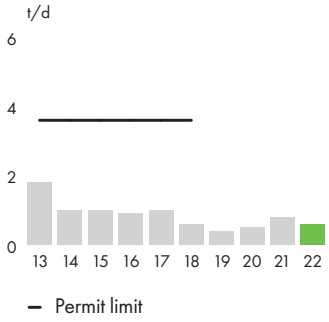
Wastewater emissions

The pulp mill's long-term goal is to substantially reduce wastewater emissions from 2008 levels by 2030. In 2022, the wastewater emissions remained well below the limit values specified in the environmental permit, with the exception of solids emissions. The eutrophication of the marine area off the coast of Pietarsaari is significantly impacted by the amount of phosphorus. Therefore, the pulp mill's wastewater treatment plant has sought to optimise phosphorus use without reducing the treatment efficiency of the mill's wastewater. In 2022, the pulp mill's phosphorus emissions per tonne of pulp produced have increased by 20% due to low production. Emissions to water from BOD_7 have decreased by 46%, nitrogen by 15% and solids by 26% per tonne of pulp produced compared to 2013. However, there was a slight increase compared to the previous year due to low production in the beginning of the year.

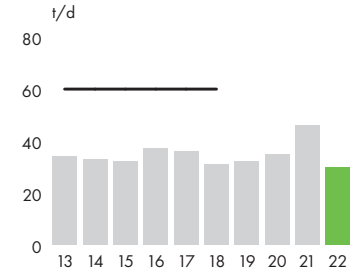
TOTAL LOAD COMPARED TO THE PERMIT CONDITION 2022

	Annual average compared to the permit condition 2022	Permit condition, annual average
COD, t/d	26	45
BOD_7, t/d	0.4	
Nitrogen, kg/d	185	500
Phosphorus, kg/d	25	45
AOX, t/d	0.12	0.45
Solids, t/d	2.3	4

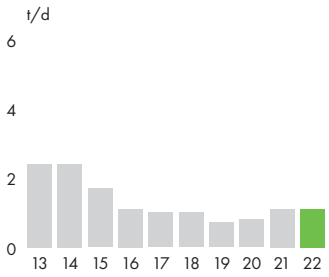
Biological oxygen demand, BOD_7



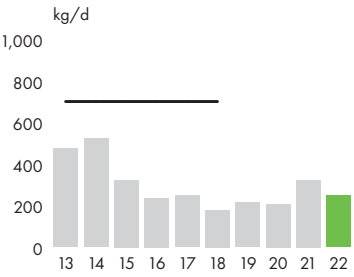
Chemical oxygen demand, COD



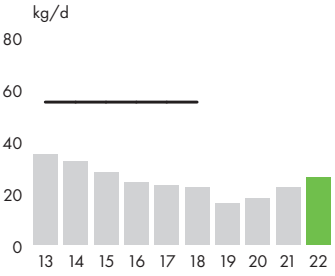
Total suspended solids, TSS



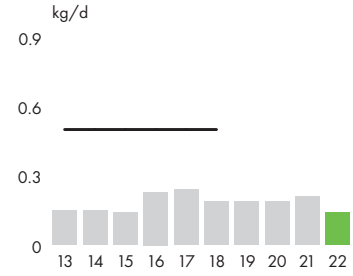
Nitrogen, N



Phosphorus, P



Adsorbable organic halides, AOX



Waste and by-products

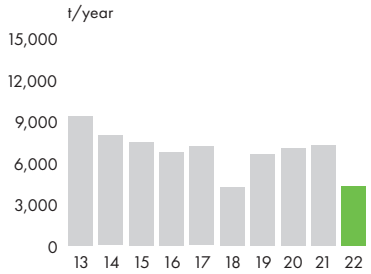
During the year, 26% of the waste generated by the pulp mill and sawmill was transferred to intermediate storage or directly recovered. A total of 4,285 tonnes of waste from the pulp mill and sawmill was sent to the on-site landfill, of which 97% was green liquor dregs. The amount of landfill waste per tonne of pulp produced has decreased by 26% from the 2013 comparison level.

UPM's Finnish pulp mills are working together to utilise green liquor dregs. In Pietarsaari, green liquor dregs is already used as a desulphurisation lime at the Alholmens Kraft power plant. The ash from the blast furnace and the lime removed from it are used in agriculture and water treatment. The residues from cleaning up the wood harvesting fields on the factory site are used as soil improver.

Production residues

Pine oil and turpentine from the pulp mill production are also important sidestreams for the mill. Pine oil is used to make biofuel, and turpentine is used in the chemical industry. An objective related to the circular economy is that all sidestreams are utilised and process waste is not taken to the landfill after 2030.

Landfill waste, dry weight



SOLID WASTE 2022 (dry weight, t/year)

	To landfill	To interim storage	For utilisation
Green liquor dregs	4,177		
Lime			
Asphalt		277	
Cable and metal scrap			802
Energy waste			186
Wood-based construction and demolition waste			270
Construction waste	107	76	
Soil constituents and timber yard cleaning waste, wood and bark residue		894	529
Total solid waste in 2022	4,284	1,247	1,787
Total solid waste in 2021	7,256	3,445	1,150

BY-PRODUCTS 2022 (dry weight, t/year)

	For utilisation
Lime sludge calcium	4,138
Green liquor dregs	384
Total by-products in 2022	4,522

Management of crises and exceptional situations

Precisely defined internal instructions are followed in the management and communications of crises and exceptional situations. The following things are considered crises and exceptional situations at UPM's mill properties and site:

- serious accidents at work and when travelling to or from work
- serious accidents (e.g. large fires, explosions, chemical accidents)
- environmental damage
- serious disruptions in production
- other exceptional situations (sabotage, demonstrations, occupational health and safety risks, risks related to UPM's reputation etc.)
- from outside the mill, e.g. threatening situations, such as problems coming from another industrial plant

Operational management includes the controlled shutdown of production and measures required to gain control of the exceptional situation, among other things. Investigation of the incident and the flow of information happens in accordance with the organisation's chain of command and agreed roles.

A crisis management team is in place at the mill to manage an emergency or crisis situation. However, other external companies on the site will operate according to their own guidelines, with all alerts being made to the emergency call centre. Crises and exceptional situations are regularly rehearsed, both independently and in collaboration with rescue authorities, to maintain and improve operational reliability. Numerous drills related to rescue operations are conducted annually.

Societal responsibility

Focusing on safety and well-being
Our goal at UPM is to be the industry leader in health and safety. Our permanent target is zero accidents. Safety is an inseparable part of our daily activities and is not seen as secondary to anything else. We strive to reduce and eliminate accidents through continuous improvements and effective risk management.

In 2022, there were no lost time incidents at the Pietarsaari factories. Proactive safety work was actively carried out at both the pulp mill and sawmill: a total of 1,410 safety rounds and discussions were recorded, as well as 1,484 safety observations and an incident report.

Our employees, as well as business partners and their employees, are required to adopt safe work practices and to comply with the rules and standards we have established. Before access to UPM's production sites, contractors participate in UPM safety training, which presents the basic safety requirements. This is complemented by job-specific safety induction and a work permit.

During 2022, a total of EUR 115,000 was spent on employee wellness. The Schauman Sportsmen and Sportswomen (SI-SU) organise sports and wellness activities for UPM employees. Different sections offer free access to a variety of sports, such as football, running and volleyball. In addition, employees can use their Epassi balance for various sports, cultural and wellness services worth EUR 250.

Added value for the Pietarsaari region
We create significant economic wealth for the Pietarsaari region. We are a major generator of tax revenue. The property taxes paid and the municipal share of corporate income taxes support the local economy. In addition, the municipal taxes and social security contributions that the employees pay from their wages have a significant local impact. Furthermore, the purchasing power of UPM's employees and subcontractors maintains and enhances the vitality of local communities. Our tax impact in the Pietarsaari area was approximately 17 million EUR.

We use nearly 5 million cubic metres of wood in our factories, most of which is sourced locally. In addition to forest owners, this provides work and a livelihood to tree harvester and timber truck drivers, loggers and other forestry professionals.

UPM is a major private employer in Pietarsaari. UPM's operations directly employed 343 people.

Local collaboration in many forms
We support sustainable development and promote the financial and mental wellbeing of the communities around us by participating in numerous community projects as a company. Our work in this arena is clearly connected to our Biofore Strategy and responsibility targets. It is coordinated under the umbrella of our Biofore Share and Care programme.

The Biofore Share and Care programme comprises three forms of support: sponsorships, donations and employee volunteering. The support can be a monetary contribution, products, materials or concrete work in projects agreed on locally. Our focus is on activities that are relevant to our business, support innovation and sustainability, or promote local vitality and wellbeing. The Biofore Share and Care programme's three priority areas are Reading and learning, Local engagement and Beyond fossils.

In 2022, our sponsorship in the Pietarsaari region mainly focused on supporting sports activities for children and young people, as well as education in maths and science. We worked with many local associations and clubs. We sponsored the UPM Wisamatte maths competition for sixth- and ninth-grade pupils in the Pietarsaari region. In the autumn, we organised an excursion to the forest for sixth-grade pupils from local schools in cooperation with the Finnish Forestry Association. The aim of the forest trips was to provide pupils with a positive forest experience and increase knowledge on the use of Finnish forests. We also contributed to the vitality of cultural life and local well-being in the area by sponsoring the local Rusk Chamber Music Festival and by building the Fäboda observation tower in cooperation with the City of Pietarsaari.

Environmental parameters

The figures related to production as well as raw material and energy consumption are published as aggregated figures at a group level in the UPM Corporate Environmental and Societal Responsibility Statement.

		2020	2021	**2022**
Production capacity	Sawn timber	280,000 m^3	280,000 m^3	280,000 m^3
	Pulp	800,000 Adt	800,000 Adt	800,000 Adt
Raw materials and chemicals	Timber Cooking and bleaching chemicals Others	See UPM Corporate Environmental and Societal Responsibility Statement for more information		
Energy	Biomass-based fuels	99.03%	99.8%	98.3%
	Fossil fuels	0.97%	0.2%	1.7%
	Purchased energy	See UPM Corporate Environmental and Societal Responsibility Statement for more information		
Emissions to air	Particulates	65 t	58 t	45 t
	Sulphur dioxide, SO_2	105 t	63 t	148 t
	Odorous sulphur compounds, TRS (S)	34 t	13 t	31 t
	Nitrogen oxides, NO_2	917 t	1,000 t	561 t
	Carbon dioxide, CO_2 (scope 1) [1]	14,849 t	4,377 t	15,122 t
	Carbon dioxide, CO_2 (scope 2) [2]			84,017 t
Raw water	Process and cooling water	53,137,625 m^3	66,955,366 m^3	46,906,673 m^3
Emissions to water	Cooling and rain water	30,496,815 m^3	33,623,923 m^3	24,757,376 m^3
	Purified waste water	26,334,110 m^3	29,500,742 m^3	22,114,297 m^3
	Biological oxygen demand, BOD_7	139 t	316 t	140 t
	Chemical oxygen demand, COD_{cr}	11,570 t	14,634 t	10,114 t
	Total suspended solids, TSS	209 t	351 t	186 t
	Total phosphorus, P_{tot}	6 t	9 t	9 t
	Total nitrogen, N_{tot}	54 t	74 t	63 t
	Adsorbable organic halides, AOX	65 t	78 t	44 t
By-products	Lime sludge calcium	1,129 t	2,327 t	4,138 t
	Green liquor dregs	119 t	1,342 t	384 t
	Total	1,248 t	3,670 t	4,522 t
Waste [3]	Solid waste to landfill (abs. dry)			
	– Green liquor dregs	6,811 t	7,205 t	4,177 t
	– Construction waste	233 t	51 t	107 t
	– Other waste	0 t	0 t	
	– In total	7,044 t	7,256 t	4,284 t
	Recyclable waste (abs. dry)			
	– Metal waste	778 t	571 t	802 t
	– Wood and bark residue, soil constituents and timber yard cleaning waste	1,775 t	413 t	529 t
	– Energy waste	94 t	104 t	186 t
	– Asphalt	167 t	0 t	
	– Construction waste	792 t	54 t	270 t
	– In total	3,606 t	1,150 t	1,787 t
	Waste in interim storage (abs. dry)			
	– Branch rejects	0 t	0 t	
	– Lime	718 t	1,310 t	
	– Metal waste	0 t	0 t	
	– Asphalt	284 t	358 t	277 t
	– Construction waste	3 t	24 t	76 t
	– Soil constituents and timber yard cleaning waste, wood and bark residue	548 t	1,752 t	894 t
	– Sludge [4]		1 t	
	– In total	1,553 t	3,445 t	1,247 t
Hazardous waste [5]		56.30 t	42.38 t	46.5 t
Land use	– total amount of land use	210 ha	210 ha	210 ha
	– area impermeable to water	200 ha	200 ha	200 ha
	– nature conservation-oriented area	10 ha	10 ha	10 ha
	– nature conservation-oriented area outside the place of business	5 ha	5 ha	5 ha

[1] Fossil emissions from own energy production, scope 1
[2] Fossil emissions from purchased energy, scope 2
[3] Waste stated as dry weight
[4] Sludge moved from the coagulation basin to the interim storage field
[5] Hazardous waste stated as total weight

Performance against targets in 2022

TARGET		ACHIEVED	COMMENT
Pulp mill	Clean run environmental irregularity observations class 3–5 irregularities: 0	No	In December, the monthly limit for solids was reported exceeded due to a fault in the secondary separator. However, there was no environmental impact and the escaped solids remained in the backfill pond.
	Solid waste to landfill < 7.6 kg/t of pulp	No	No permanent use has yet been found for green liquorice sludge.
	Testing of recycled nutrients as an additional nutrient source for the waste water purification plant	No	A cost-competitive recycled feed was not yet found. The study is ongoing.
	Process water consumption < 35.6 m^3/t of pulp	No	In the reference period, months 7–12, the target was met in individual months.
	COD emission from treated process water < 17.5 kg/t of pulp and < 45 t/d	Yes	In the reference period, the average specific emissions in months 7–12 were in line with the target.
	AOX emission from treated process water < 0.13 kg/t of pulp and < 0.45 t/d	Yes	In the reference period, the average specific emissions in months 7–12 were in line with the target.
	Phosphorus emissions from purified process water < 45 kg/d	Yes	The average emission for the whole year was 25 kg/d
	Nitrogen emissions from purified process water < 500 kg/d	Yes	The average emission for the whole year was 185 kg/d
	Solids emissions of purified process water < 4 t/d	Yes	The average emission for the whole year was 2.3 t/d
	Specific emissions of acidifying flue gas < 1.40 kg/t of pulp	Yes	The average specific emissions for the year were in line with the target.
	Specific emissions of fossil carbon dioxide < 3 kg/t of pulp	No	Annual maintenance shutdown, production disruptions and occasional fuel shortages have led to occasional recourse to fossil fuels during the year.
	NO_x emissions from the soda boiler < 250 mg/m^3 (n)	Yes	The average emission for the whole year was 108 mg/m^3 (n)
	SO_2 emissions from soda boilers < 40 mg/m^3 (n)	Yes	The average emission for the whole year was 1.7 mg/m^3 (n)
	Soda boiler TRS emission < 8 mg/m^3 (n)	Yes	The average emission for the whole year was 0.8 mg/m^3 (n)
	Soda boiler particulate emissions < 40 mg/m^3 (n)	Yes	The average emission for the whole year was 8.7 mg/m^3 (n)
	Furnace NOx emission < 400 mg/m^3 (n)	Yes	The average emission for the whole year was 55 mg/m^3 (n)
	Furnace SO_2 emission < 160 mg/m^3 (n)	Yes	The average emission for the whole year was 2.4 mg/m^3 (n)
	Furnace TRS emission < 16 mg/m^3 (n)	Yes	The average emission for the whole year was 0.01 mg/m^3 (n)
	Furnace particulate emissions < 45 mg/m^3 (n)	Yes	The average emission for the whole year was 4.0 mg/m^3 (n)
Alholma sawmill	Clean run environmental irregularity observations class 3–5 deviations: zero.	Yes	0 Clean run irregularities
	Improvement in energy efficiency by 1% at timber level	Yes	Target was met.
	Environmental observations, at least two per month	Yes	31 total

Targets for 2023

TARGET	
Pulp mill	
Clean Run environmental irregularity observations' class 3–5 deviations: 0	
Solid waste to landfill < 6.7 kg/t of pulp	
Testing of recycled nutrients as an additional nutrient source for the waste water purification plant	
Process water consumption < 35.4 m^3/t of pulp COD emissions from purified process water <16.2 kg/t of pulp and < 45 t/d AOX emissions from purified process water < 0.12 kg/t of pulp and < 0.45 t/d Phosphorus emissions from purified process water < 45 kg/d Nitrogen emissions from purified process water < 500 kg/d Solids emissions of purified process water < 4 t/d	
Specific emissions of acidifying flue gas < 1.38 kg/t of pulp	
Specific emissions of fossil carbon dioxide < 3 kg/t of pulp	
NO_x emissions from the soda boiler < 250 mg/m^3 (n) SO_2 emissions from soda boilers < 40 mg/m^3 (n) Soda boiler TRS emission < 8 mg/m^3 (n) Soda boiler particulate emissions < 40 mg/m^3 (n)	Furnace NOx emission < 400 mg/m^3 (n) Furnace SO_2 emission < 160 mg/m^3 (n) Furnace TRS emission < 16 mg/m^3 (n) Furnace particulate emissions < 45 mg/m^3 (n)

Alholma sawmill
Improvement in energy efficiency by 1% in 2023 vs. 2022 at Timber level
Clean Run environmental irregularity observations' class 3–5 deviations: 0
Environmental observations, at least 2.5 per month in 2023
Environmental observations, at least 2 per month
Reduction of incineration waste, target 0.15 kg/load of timber m^3

EMAS
Verified environmental management
REG.NO. FI - 000058

Validation Statement

As an accredited verifier, Inspecta Sertifiointi Oy (FI-V-0001) has inspected the environmental system, the UPM Pietarsaari Environmental and Social Responsibility 2022 Report and the information concerning UPM Pietarsaari in the UPM concern's Environmental and Social Responsibility Report's update information for 2022.

On the basis of this examination, the environmental verifier confirmed on 11 April 2023 that the environmental management system, this UPM Pietarsaari Environmental and Social Responsibility 2022 Report and the update information concerning UPM Pietarsaari in the UPM concern's Environmental and Social Responsibility Report 2022 are in compliance with the requirements of the EU's EMAS Regulation (EC) No. 1221/2009.

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