UPM BIOFORE
BEYOND FOSSILS

UPM Kaukas

ENVIRONMENTAL AND SOCIETAL RESPONSIBILITY 2021



UPM Kaukas

The mills of UPM Kaukas are located on the shore of Lake Saimaa in Lappeenranta. A pulp and paper mill, a biorefinery and a sawmill operate at the mill site. UPM's largest research and product development centre, UPM Metsä's Eastern Finland wood-sourcing management and the Lappeenranta forest service office are also based at Kaukas.

The Kaukas mills form a unique integrated bioforestry industry unit where pulp, magazine paper, sawn timber, biofuels, biochemicals and energy are produced from renewable raw materials. In addition to UPM's mills, Kaukaan Voima Oy's biopower plant operates at the site, producing heat and electricity for Kaukas's mills and the inhabitants of the local area. Around 93% of the energy produced by Kaukaan Voima is made from renewable biomass.

Having several operations in the same area has many benefits. Integrated production can be controlled efficiently, from the point of view of environmental protection. The short distance between the mills improves cooperation, decreases the need for transport and enables the processing of effluents by a shared biological purification plant. Sustainably sourced wood raw material, the integrated mill unit's high level of energy self-sufficiency and the recycling of by-products into raw materials are the cornerstones of our operation.

This EMAS report covers the environmental aspects of the Kaukas pulp and paper mill. Social responsibility is addressed with regard to the entire integrated mill unit.

Production capacity	300,000 tonnes of coated magazine paper 770,000 tonnes of softwood and birch pulp 380,000 cubic meters of pine timber 130,000 tonnes of renewable diesel and renewable naphtha
Personnel	Paper mill 246, pulp mill 259, sawmill 115, biorefinery 96, UPM Metsä 28, NERC 173. In total more than 1,000 persons work at UPM Kaukas in Lappeenranta.
Products	Magazine papers: (MWC, LWC) UPM Star, UPM Valor, UPM Ultra Pulp: UPM Betula, UPM Conifer and UPM Conifer Reinforcement Wood products: UPM Timber, UPM Plus Biofuels: UPM BioVerno diesel, UPM BioVerno naphtha Biomedical products: GrowDex®, FibDex®
Residues	Pitch oil, turpentine, pine oil
Bioenergy	Heat energy and electricity
Certificates	EMAS – EU Eco-Management and Audit Scheme ISO 14001 – Environmental Management System ETJ+ – Energy Efficiency System ISO 50001 Energy Management System ISO 9001 – Quality Management System PEFC, Programme for the Endorsement of Forest Certification FSC® wood origin monitoring system – Forest Stewardship Council® ISO 45001 – Occupational Health and Safety System ISCC EU – International Sustainability and Carbon Certification) ISCC PLUS – International Sustainability and Carbon Certification RSB EU RED – Roundtable on Sustainable Biomaterials RSB low ILUC risk – Roundtable on Sustainable Biomaterials RSB Standard for Advanced Products – Roundtable on Sustainable Biomaterials, Finland's national sustainability scheme ISO 22000 – Food Safety Management System The certificates can be found with the Certificate Finder tool at www.upm.com/responsibility
Environmental labels	UPM pulp products are approved for use in EU Ecolabel and Nordic Ecolabel paper. EU Ecolabel FI/11/001 for paper products More about PEFC products: www.pefc.fi More about FSC products: http://fi.fsc.org

UPM Kaukas Environmental and Societal Responsibility 2021 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 2021. 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 2023.

UPM delivers renewable and responsible solutions and innovate 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 17,000 people worldwide and our annual sales are approximately EUR 9.8 billion. Our shares are listed on Nasdaq Helsinki Ltd.
UPM Biofore – Beyond fossils.
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EU Ecolabel : FI/011/001

Review of year 2021

In 2021, the environmental impact of the UPM Kaukas integrated mill unit remained mostly at the same level as it has been since the turn of the millennium. Water pollution is partly proportional to production and its intensity. During the 2000s, the pulp mill's production capacity has increased, but the load to the water body has been on a steady downward trend. Processes have been developed to reduce water pollution per tonne of pulp produced. The operation continued to be material efficient, raw materials were carefully utilised and all waste generated in the process was recovered, with the exception of green liquor dregs from pulp production.

The production situation at the pulp and paper mill improved compared to the previous year, with no major maintenance shutdowns. The pulp mill's electricity production was limited by a malfunction of the pulp mill turbine early in the year, which led to a power outage for several weeks.

The year was fully in line with the environmental permit obtained in 2018. The monitoring programme for the landfill was updated to comply with the supplement to the environmental permit, and since the summer, the Tuosa landfill was monitored according to the new monitoring programme. There were two exceptions to the environmental permit limit. First, a long-lasting odour nuisance was caused by wastewater treatment in the spring. Second, the chlorine concentration permissible limit was exceeded in the bleach scrubber of the pulp mill's pulp line, which was detected in air pollution measurements. The other conditions of the environmental permit were met. The environmental performance met the obligations of the BAT (Best Available Techniques) document without compromising the water consumption at the paper mill.

All the stakeholder feedback received during the year (30) concerned odour issues related to wastewater treatment. The dredging, which had previously reduced odours, was renewed in spring 2021 to remedy the odours. This time it did not help, but instead, the odour situation deteriorated further as the leveling pond became acidic during dredging. Chemicals were used to support the oxygenation of the pool, which helped to bring the situation to a reasonable level during the summer. The aim is to modify the basin to prevent future odour generation. Planning to change the structure of the basin is underway.

Continuous improvement will be pursued to meet UPM's 2030 emission reduction targets. Improvement of energy efficiency and reduction of fossil carbon dioxide emissions, as well as water consumption, were the environmental objectives of Kaukas for 2021. In addition to these, the objective of the pulp mill was to reduce specific discharges going into the water system, and at the paper mill, the objective was an improvement in material efficiency by reducing fibre emissions. The energy efficiency targets were almost fully met. In terms of electricity, the pulp mill did not achieve self-sufficiency due to a malfunction of the turbine in the recovery boiler. The reduction of fossil carbon dioxide emissions was successful. Specific discharges to water from pulp production also decreased, and water consumption was lower than in the previous year. The fibre emission target was slightly missed, but there was an improvement compared to the previous year.

The previous year's study on the impact of Kaukas on the status of the eastern Pien-Saimaa was revised in 2021. The impact of the Kaukas on the nutrient content in the reservoir is about 10%. During the summer, phosphorus loads in particular are higher than during the off-season. The summer nutrient load can be reduced by placing bundles of trees in the discharge stream of the treatment plant, following a tree bundle experiment started the previous year. The nutrients in the effluent are used by the biofilm that grows on the tree tops.

An inventory of invasive species in the area of the integrated mill unit and the Tuosa landfill was carried out. This will

be used as the basis for a control plan. The control of giant hornworts has been going on for years, and now the control of other invasive species is also starting.

The target is zero accidents

UPM's ongoing target is zero accidents. During the year, the Integrated mill unit suffered 11 accidents at work resulting in absence, 7 of which involved external operators. The total number of accidents at work suffered by the Kaukas mills' personnel fell by more than a third compared to the previous year. On the integrated mill unit, there were 4 lost time accidents involving own personnel, two of which occurred at the sawmill. The pulp mill and the research centre both had one incident. At the paper mill and the biorefinery, there were no accidents resulting in absenteeism among own personnel. At the end of 2021, the paper mill had operated for more than 1,000 days without a lost time accident, an all-time record.

As precautionary safety measures, all UPM employees and contractors are required to report all near-miss situations and safety and environmental observations in the global One Safety reporting tool. These reports are reviewed daily, and any corrective measures are taken without delay. In addition, safety discussions are actively held at the workplaces, for example, between supervisors and subordinates, and safety tours are conducted throughout the mill.

Value from responsibility

Responsibility is an essential part of UPM's operations. UPM is one of the largest employers in the city, employing around 1,000 people and around 170 summer interns. The tax revenue generated by UPM's operations has a significant social impact. In 2021, UPM's local tax impact in the Lappeenranta area is approximately 45 million euros, and the consumption impact resulting from the integrated mill unit is approximately 47 million euros. UPM also supports local vitality through sponsoring local projects, which in 2021 were focused on learning, reading and sports activities for children and youths. Study visits, mill visits and participation in various events are used to educate young people about sustainable development, working life and society. In addition, schoolchildren, kindergarten-aged children and other interest group representatives are taken on forest trips.

Vesa Volmari
General Manager, UPM Kaukas

Minna Maunus-Tiihonen
Environmental Manager

Management of crises and exceptional situations

The following things are specified under the management of crises and exceptional situations, and communications at the mill properties and sites of Kaukas:

- Serious accidents and hazardous situations (major fires, explosions, chemical accidents)
- Environmental damage
- Serious work accidents (also on the way to or from work), traffic accidents on the mill site
- Serious production disruptions
- Other exceptional situations such as sabotage, demonstrations, work health and safety risks, risks that could harm UPM's reputation, cyber threats and network destruction, and threatening situations not within Kaukas e.g. at other industrial plants etc.

In cooperation with local operators

Rescue operations are always led by the rescue authorities. The mill's organisation is responsible for technical prevention and directs the extinguishing and rescue operations of its own personnel. The representatives of the production department are responsible for operational management, taking care of the controlled shutdown of production and other measures to bring the exceptional situation under control. Investigation of the incident and the flow of information happens in accordance with the organisation's chain of command and agreed roles. The crisis communication group either consists of members of the mill's management group or is agreed on separately on a case-by-case basis.

Exceptional situations relating to Kaukaan Voima Oy and projects at the Kaukas mill site will be dealt with in accordance with the Kaukas integrated unit's guidelines and the organisation's actions. Other external companies located at the mill site will act according to their own guidelines, however, so that all alerts will be made to the UPM Kaukas mills' emergency number as well as to the general emergency number.

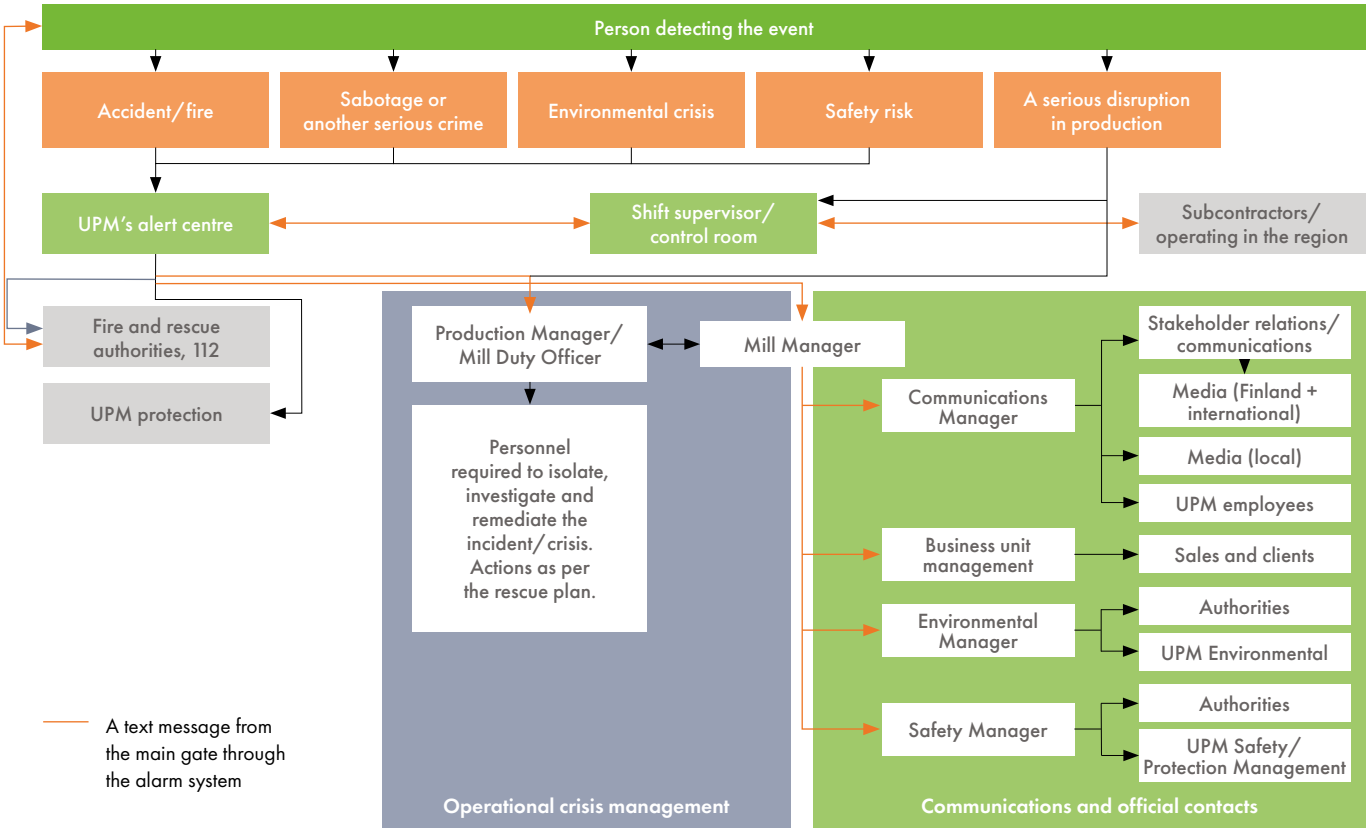
We actively cooperate with the rescue services. In 2021, the team leader course students of the South Karelia Rescue Department came to the mill site to provide training on various accident situations. Weekly drills were held several times by the rescue service and its contracted fire brigades on the mill site. The planning and implementation of the exercises were done in cooperation with the UPM Kaukas Protection Department.

A recovery boiler explosion emergency evacuation drill was organised at the pulp mill.

The Kaukas mill fire brigade trained almost weekly to maintain operational readiness.

The exceptional situation caused by the coronavirus pandemic continued throughout the year. The Kaukas integrated mill unit followed separate coronavirus guidelines, which covered both own personnel and contractors and visitors. The coronavirus steering groups set up for the mill met regularly. UPM supported the fight against the coronavirus pandemic by distributing Covid-19 home tests to its personnel for their leisure time, in addition to face masks.

Crisis communication organisation chart



UPM Kaukas

Contribution to UN Sustainable Development Goals in 2021

Air

Fossil carbon dioxide emissions into the air were reduced by

1%

Sulphur emissions reduced by

22%

Water

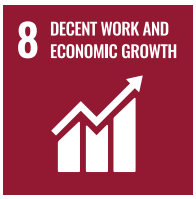
COD load per tonne of paper produced decreased by

21%

Of the nutrients used at the purification plant

26%

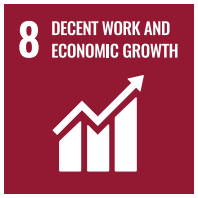
were recycled nutrients.



Health

The gym of Kaukas' own sports club Kaukaan Lyly was used about

17,000 times



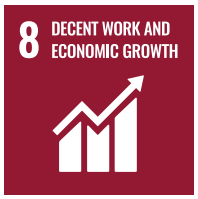
Taxes

The intergrate's tax impact approx.

EUR 45 million

Property taxes: EUR 0.7 million
Estimated municipal taxes on personnel salaries: EUR 8.3 million
Estimated corporate income tax: EUR 36 million based on the number of employees*

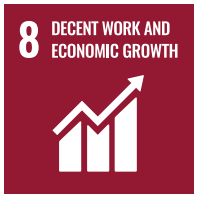
*Share for all the municipalities approx. 30%. Each municipality receives a share of this depending on the ratios calculated based on business and forest operations in the municipality.



Safety

1,083 days

without lost time accidents at the paper mill at the end of the year, an all-time record. Proactive safety work has been actively pursued. The pulp and paper mill has recorded 1,873 observations/incident reports. There have been 2,388 safety rounds and discussions.



Consumption impact*

Local impact on expenditure caused by the mill approx.

EUR 47 million

The consumption impact in the whole of Finland is approx.

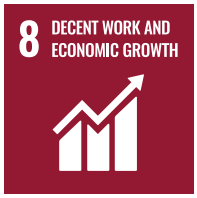
EUR 96 million

*Direct and indirect employees´ private consumption of commodities through net income.

Certified Fibre

84%

of the fibre used in paper production was FSC® and/or PEFC-certified. UPM's goal is that all the fibre used is certified by 2030.



Community

In a work placement or apprenticeship

75 students

19 final workers

Cooperation was active between different schools and educational institutions.

Energy

Share of biofuels

91%

of all fuels used.

98%

of the energy produced by biofuels.

Employment

UPM Kaukas directly employed

933 people

and over

170 summer workers

The indirect local impact of employment was approximately 981 persons. Furthermore, an average of 393 workers from contractors worked at the site daily.

Waste

0 t

process waste to landfill from the paper mill. The only waste fraction taken finally to landfill was green liquor dregs.

Supply Chain

89%

of raw material spend covered by UPM Supplier and Third Party Code (wood not included).

Air

Biofuels such as bark and black liquor accounted for 98% of the energy used on the site. The bark removed from the wood at the pulp and paper mills and sawmills was used at the Kaukaan Voima power plant. The pulp mill's recovery boiler used black liquor, a by-product of the pulp production process, as fuel. Natural gas and peat were used as fossil fuels. Overall, fossil carbon dioxide emissions decreased by about one percent from the previous year. In terms of particulate emissions (kg/tonne of product), they further decreased as the production of the pulp and paper mill increased.

The specific air pollution from the pulp mill was at a good BAT level, except for particulate matter. There was a significant increase in the measurement results for particulate emissions from the recovery boiler due to problems with the measurement equipment. Exceptionally, the 2021 emissions data are based on single measurement values. The particle counter was renewed in December and the aim is to report emissions data based on continuous measurement again from 2022, as before. To reduce particulate emissions, the electric filters and odorous gas scrubber of the recovery boiler have been optimised and maintained.

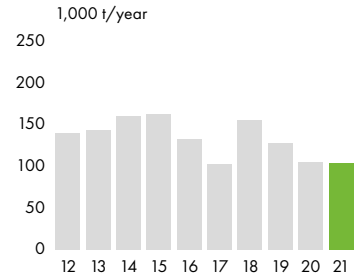
Sulphur dioxide emissions decreased compared to the previous year, as the use of a backup burner in the odorous gas boiler to support odorous gas treatment was lower than in the previous year. In the air quality measurements of the City of Lappeenranta, the emissions of sulphur compounds did not exceed the daily guideline value with regard to sulphur dioxide or odorous sulphur compounds (TRS). TRS emissions consist of TRS compounds in the odorous gas from the recovery boiler, the odorous gas boiler and the mead furnace, fugitive emissions and emissions during abnormal situations. Incidents of nuisance emissions, where odorous gas cannot be treated, decreased from the previous year. The diffuse emissions of wastewater treatment and sludge treatment are not included in the figures.

In the spring, the wastewater treatment plant released a smell of sulphur compounds into the environment. The situation started when two wastewater treatment plant basins were dredged to reduce the odour they were generating. Unfortunately, dredging did not improve the situation this time. The cooling equipment further aggravated the situation by spreading odours into the environment. The odour situation was solved by adding chemicals to the reservoir during the summer. This long-lasting odour nuisance was the second of the 2021 environmental permit applications.

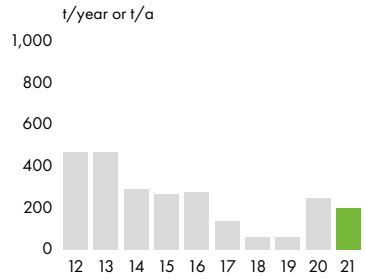
Another permit violation was detected during annual emission measurements at the chlorine-containing gas scrubber in the softwood bleaching plant. The chlorine content of the gases discharged into the air exceeded the limit value of the environmental permit. The cause was found to be a mechanical failure of the washing equipment, which was immediately repaired. Recalibrations will be carried out during 2022.

The total emissions into the air from the pulp and energy production of the mills of UPM Kaukas are presented in the following graphs describing annual emission amounts. These figures also include UPM's share of the total emissions of Kaukaan Voima.

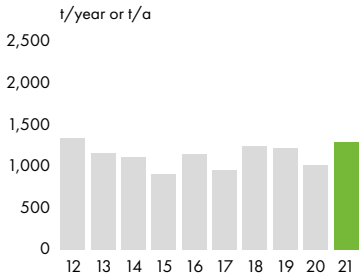
Carbon dioxide (fossil), CO_2



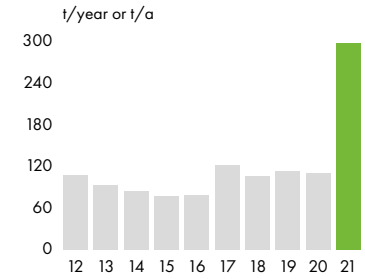
Sulphur dioxide, SO_2



Nitrogen oxides, NO_x



Particulates, TSP



In addition to the emissions of UPM Kaukas, the atmospheric emissions include the share of the energy used by the integrated unit from Kaukaan Voima.

Waste

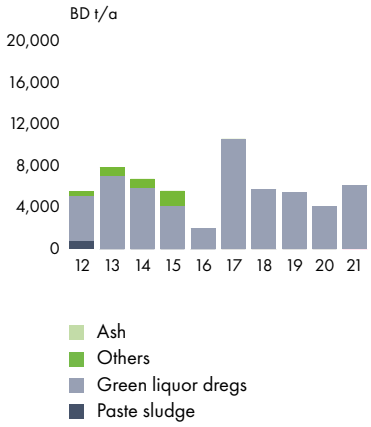
In pulp and paper production, approximately 28,500 tonnes of waste was created as dry material in 2021. The majority of this, some 23,500 tonnes, was process waste. Other operational waste accounted for around 5,000 tonnes. The figures include UPM's share of Kaukaan Voima's waste.

6,127 tonnes of waste were disposed of at the Tuosa landfill, which was about 48% more than in the previous year. The remaining waste was diverted for beneficial use either directly or through intermediate storage. In 2021, the share of reuse was 79% of the total amount of waste. Green liquor dregs, along with fly ash and bottom ash from Kaukaa Voima, were used as raw materials for earthworks. Bark sand and sewage treatment plant sludge were used as composting and raw materials. Only the green liquor dregs created in the chemical cycle of pulp were disposed of at the Tuosa dump, a part of which was utilised, mixed with ash, in the field structures used for the storage of wood and fuels.

Much of Kaukas' green liquor dregs have already been used in field construction. A new project between UPM's pulp mills and an external operator is exploring the use of green liquor dregs in new products. The first mill test runs will take place in spring 2022.

One of UPM's global 2030 sustainability targets is to recycle or reuse all its process waste. One of the most difficult by-products to recycle is green liquor dregs, for which UPM has long sought resource-efficient circular economy solutions.

Waste to the Tuosa landfill



The tonnes in the graph are given as dry weights.

Noise

Noise into the surrounding area is caused by the operations of the Kaukas mills. According to the environmental permit, the noise level in outdoor areas of the residential area in the vicinity of the mill site may not exceed 55 dB in the daytime and 50 dB at night. A computational noise model has been drawn up for the mill site's sphere of influence, the veracity of which is monitored regularly. The noise model is updated in conjunction with investments and significant process changes.

In the noise measurements carried out in 2021, noise levels during the day were below the limit values at all monitoring points. At night, the limit value was exceeded at one measurement point. This was due to the continuous operation of the plants and the geographical location of the mill. In 2020, noise attenuators added to one sawmill dryer and to the turbopump of the pulp mill's recovery boiler significantly reduced noise at these sites. The effect was also reflected in the noise level generated by the whole integrator. In addition, Kaukas' conservation wardens regularly measured the noise around the mill site. Weather conditions, wind direction and other ambient noise, in addition to the noise from the plant, affected the noise levels at the different measurement points.

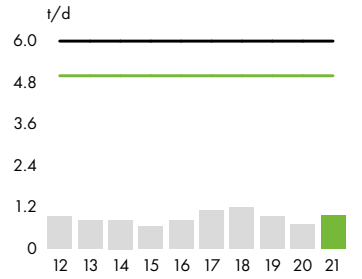
Water

The Kaukas mill used a total of 98 million cubic metres of water in the manufacture of pulp and paper in 2021. Most of the water was used, for example, for cooling processes, with 39% of the water being process water that was treated in a biological treatment plant. Water consumption per tonne of pulp and paper produced decreased compared to the previous year. As a result of the investment made in 2020 to reduce water consumption, the paper mill's water consumption decreased by 23% in 2021 from the previous year.

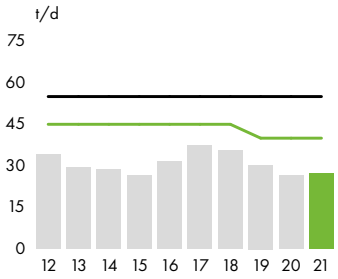
Wastewater treatment worked effectively all year long. The load to the Saimaa increased for all measured variables compared to the previous year, partly due to increased pulp and paper production and partly due to dredging at the wastewater treatment plant in the spring. Biological oxygen demand (BOD) increased by almost 30% and chemical oxygen demand by 2%. Emissions of phosphorus (P) increased by 18%, nitrogen (N) and organic halogenated compounds (AOX) by 11%. The effluent load from the pulp mill was at BAT levels, except for the phosphorus load, which was much better, below the BAT minimum. The wastewater loads in the production of paper were at BAT level, except for water consumption, which was over the BAT level.

The separating power of the purification plant was good with regard to all loading components. 99% of the BOD load directed

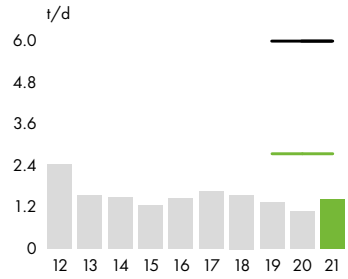
Biological oxygen demand, BOD_7



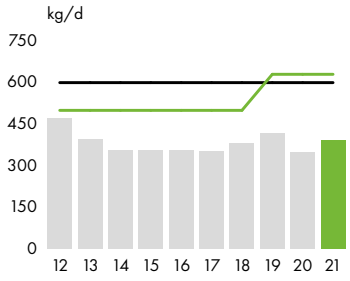
Chemical oxygen demand, COD



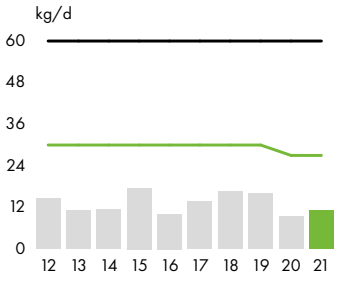
Total suspended solids, TSS



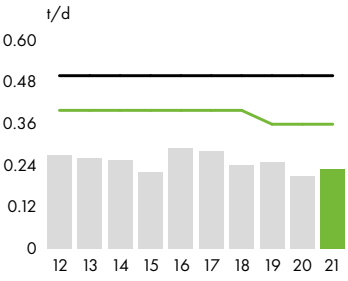
Nitrogen, N



Phosphorus, P



Halogenated organic compounds, AOX



Monthly limit Annual permit

In autumn 2020, tree limbs were placed in the Pappilanoja in Kaukas, inspired by a project of the Finnish Environment Institute. The first year's studies have shown that tree tops have had a significant impact on water quality, especially in summer.

to the purification plant was removed, 83% of the COD load, 87% of phosphorus, 70% of nitrogen and 64% of organic halogen compounds. 26% of the nutrients required by the treatment plant were replaced by recycled nutrients. With the test run at the Kaukas mill, UPM is one step closer to the 2030 target of using only recycled nutrients in wastewater treatment. In the test run, the reject water from the external operator worked well as a nutrient. However, the test had to be stopped when the supplier's process changes made the nutrient powder no longer usable.

In the spring, the equalisation and reserve basins of the treatment plant were dredged to remove solids from the basins in order to reduce the possibility of fermentation in the basins. During the dredging process, the discharge of solids increased temporarily. During dredging, the aerators in the equalisation basin were off and the basin drifted into an anoxic state. At a suitable acidity level, in an anoxic condition and when treating sulphur-containing wastewater, sulphur compounds were released from the tanks, causing odour nuisance to the environment. To control odours, additional chemicals were used, which contributed to increasing the load in the water body.

A 2020 environmental permit study on the impact of the Kaukas mill on the water status of the eastern Pien-Saimaa indicates that the impact of the site's load on the nutrient concentrations in the water body is around 10%, which affects the eutrophication and ecological status of the water. In 2021, the study was complemented by more recent and extensive modelling with measurement results, which confirmed a 10% impact on the water body in terms of nutrients. The status of the water body is close to the good to satisfactory classification factors, and nutrient concentrations have been on a slight downward trend, especially in the vicinity of the plant. The condition of the water system is expected to continue improving gradually in the water management plan as well.

Reducing summer nutrient discharges would further reduce the impact of the Kaukas mills on the status of the discharge water body. A test on the ability of tree tops to bind nutrients in flowing water, started a year ago, has been promising. In winter the effect was small, but during the growing season the nutrient uptake was up to 50% for phosphorus and 20% for nitrogen.

Societal responsibility

Occupational, process and environmental safety are an integral part of our daily activities and nothing takes precedence over them. Our permanent target is zero accidents. As a result of our active proactive work, our safety performance in 2021 continued to improve. We strive to reduce and eliminate accidents through continuous improvements and effective risk management. We require all of UPM's employees and contractors to report any environmental and safety observations.

An incident occurred at the Lappeenranta biorefinery in May when a process gas pipe ruptured and leaked, causing an explosion and fire. No one was injured and the fire was quickly extinguished. The fire was thoroughly investigated internally and with the authorities. Corrective measures were identified to avoid similar incidents, such as mapping the current state of process safety at the Lappeenranta biorefinery and pulp mills in Finland. Based on the study, a new Group objective on process safety and the following development actions were defined.

We train our personnel continuously about safety. During 2021, more than 80 safety training sessions were organised and attended 1,890 people. In the context of the coronavirus situation, most of the training took place online. There was practical training on firefighting, fall protection, lift rescue, basic resuscitation and defibrillator use.

One of the safety focuses for 2021 at the paper mill was the development of a positive safety culture. With these campaigns, we wanted to highlight the good safety performance in 2020, as well as give our personnel a sweet remembrance. Active safety workers were also remembered at the pulp mill. As the evenings grew dark in early October, we distributed reflectors to all those in the distance.

All paper mill employees were given a chocolate bar wrapped in a safety-themed wrapper. Wrapping reminds us of a familiar but important advice, "Take a moment!". The back cover of the plate is also printed with greetings and thanks to all the personnel for their good safety work.

Monthly plant masks were distributed to pulp mill workers for their leisure time. During the second half of the year, home tests were also conducted.

We have supported personnel well-being through a range of health and safety measures. We have distributed face masks and home tests to personnel at work and leisure and offered COVID-19 testing in occupational health. We offered the mill's sports hall to the occupational health service for six days for vaccinations.

Personnel mobility and physical activity

The coronavirus pandemic continued to overshadow the activities of Kaukas' own sports club, Kaukas Lyly, by reducing the number of planned activities. Despite the challenging situation, the Lyly gym was mostly open. Team sports were on a break, but there were plenty of enthusiasts at the gym, in the gym and on the tennis court. Around 17,000 people visited the hall, which was a good number considering the situation. Through Lyly's various sections, the personnel could play beach volleyball, golf, orienteering and rowing, among other things.

In addition to the services offered by their own sports club, the people at Kaukas were able to use their ePassport balance for various sports, cultural and wellness services worth 200 euros.

All personnel had access to a break exercise app, which encourages them to take breaks from work and increases their physical and mental wellbeing. The use of the app also helped to improve work ergonomics, especially when working remotely.

Cooperation with local communities

Our aim is to raise awareness of jobs in the sector and encourage young people to consider the industry. We participated in events organised by local educational institutions, such as the virtual DuuniDay contact event organised by the Lappeenranta University of Technology. Visiting lectures in schools and colleges in the region was also an integral part of our activities, although, exceptionally, mainly virtual. The work of the forest ambassadors also continued, as in previous years.

The Kaukas pulp mill donated a screw press to the University of Applied Sciences of South-East Finland for educational use. The cooperation with the College of Biotechnology, Civil Engineering and Electrical and Automation Engineers is also varied.

As a company, we are involved in many community projects which support sustainable development and promote the wellbeing of the communities around us. In 2021, most of our sponsorship was aimed at supporting

learning, reading and sports activities for children and youths. We work together with many local associations and clubs. With our help, they organised, for example, sports activities for schoolchildren, summer holiday activities, after-school clubs and free sporting events for children.

We provided timber from our sawmill for the traditional Myllysaari Midsummer bonfire built by Lions Club Lappeenranta Saimaa. We also participated in Lappeenranta's Enterprise Village, where we helped children learn about the opportunities of the bioeconomy and international activities, as well as how products are made and sold. We supplied paper and pulp for the Miekin teen taidetta event for artists with special needs. The exhibition "Natural light – sculptural lamps" at the gallery in Lappeenranta featured lamps made from larch stumps donated by us and used in the construction of the Vehkataipalee canal for almost 80 years.

In September, nearly 250 sixth-grade pupils from six different schools in Lappeenranta joined us on forest trips organised in cooperation with the Finnish Forestry Association to learn about the forest and its products. In addition, every pupil got a chance to plant a sapling that will become a part of the forest of the future and eat packed lunch by a campfire. The aim of the forest trips was to provide pupils with a positive forest experience and increase knowledge of the use of Finnish forests.

Added value for the region

We bring significant wealth to the region of South Karelia, the positive effects of which manifest in many ways. We generate a significant amount 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. Our tax impact in the local area is approximately 45 million euros and the expenditure impact created by the integrated mill unit is approximately 47 million euros.

We use over five million cubic metres of wood at our mills, most of which is sourced from nearby areas. In addition to forest owners, this provides work and a livelihood to tree harvesters and timber truck drivers, loggers and other forestry professionals.

As one of the largest private employers in Lappeenranta, UPM Kaukas employed nearly 1,000 skilled workers in 2021. For the summer, we hired more than 170 summer workers, mainly from local schools. During the year, we offered internships to 75 students/trainees and carried out 19 thesis projects.

A student from Saimaa Vocational College wanted to combine Finland's beautiful nature with clothing. These dreams led to the creation of a dress, for which she got the birchbark from Kaukas. Photo by Jonna Wallin.

Environmental parameters

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

		2019	2020	**2021**
Production capacity	Magazine paper	300,000 t	305,000 t	300,000 t
	Pulp	770,000 t	770,000 t	770,000 t
	–softwood	440,000 t	440,000 t	440,000 t
	–birch	330,000 t	330,000 t	330,000 t
Raw materials	Wood, cooking chemicals, bleaching chemicals, filler and coating pigments, paper manufacturing pigments	See UPM Corporate Environmental and Societal Responsibility Statement for more information		
Energy	Biomass-based fuels	91%	91%	91%
	Fossil fuels	9%	9%	9%
	Purchased electricity[1]			
Emissions to air include UPM's share of Kaukaan Voima's emissions	Fossil carbon dioxide, CO_2	128,161 t	105,658 t	104,304 t
	Nitrogen oxides, NO_x	1,223 t	1,021 t	1,294 t
	Sulphur dioxide, SO_2	62 t	248 t	201 t
	Dust particles	120 t	127 t	318 t
	Odorous sulphur compounds, TRS	79 t	42 t	31 t
Water intake	Process and cooling water	91.3 million m^3	85.4 million m^3	98.3 million m^3
Discharges to water	Wastewater	39.6 million m^3	36.2 million m^3	38.3 million m^3
	BOD_7	344 t	266 t	303 t
	COD	11,062 t	9,434 t	9,962 t
	Total suspended solids, TSS	484 t	384 t	519 t
	Phosphorus, P	5.9 t	3.3 t	4.1 t
	Nitrogen, N	151 t	123 t	140 t
	Organic halogen compounds, AOX	93 t	75 t	84 t
Waste[2]	Taken to landfill for disposal	5,447 t	4,134 t	6,127 t
	– green liquor dregs	5,447 t	4,134 t	6,127 t
	For utilisation	26,215 t	21,677 t	19,251 t
	– bark sand and stones	524 t	986 t	1,189 t
	– green liquor dregs	8,231 t	5,368 t	4,207 t
	– lime sludge and limestone calcines	3,195 t	4,654 t	1,057 t
	– ash from the power plant	6,367 t	5,720 t	7,191 t
	– recycled cardboard and paper	488 t	447 t	752 t
	– metals	414 t	515 t	516 t
	– soil	6,547 t	0 t	0 t
	– construction waste			1,016 t
	– other separately collected waste	0 t	0 t	368 t
	– wastewater treatment sludge	0 t	2,698 t	2,955 t
	To interim storage	197 t	405 t	3,160 t
	– lime fertiliser	197 t	405 t	727 t
	– soil	0 t	0 t	2,433 t
	Hazardous waste	117 t	265 t	265 t
Land use	Total amount of land use	215 ha	232 ha	232 ha
	Area impermeable to water		203 ha	203 ha
	Area directed towards nature conservation		29 ha	29 ha
	Area directed towards nature conservation outside the place of business		68 ha	68 ha

[1] See the UPM Corporate Environmental and Social Responsibility Statement for more information (e.g. energy indicators).
[2] Waste quantities are given in dry weight, excl. hazardous waste.

Performance against targets in 2021

TARGET	ACHIEVEMENT	COMMENT
A safe workplace LTAF (lost time accident frequency) 0	Partly	There was one lost time accident at the pulp mill. None at the paper mill. LTAF pulp 2.3 and paper 0.
Active precautionary safety activity – safety and environmental observations Paper mill > 700 Pulp mill > 1,000 – safety rounds and discussions Paper mill > 500 Pulp mill > 1,500 units	Yes	Precautionary safety measures were carried out well. There were 791 observations and incident reports at the paper mill and 1,082 at the pulp mill. There were 454 safety talks and tours held at the paper mill and 454 at the pulp mill.
Paper mill material efficiency – Fibre emissions < 6.0 t/d	Partly	Fibre discharges to the treatment plant were above the target (6.1), but lower than the previous year.
Reducing specific emissions from the pulp mill compared to the previous year – COD and AOX kg/Adt < 2020	Yes	Specific emissions decreased for COD and remained at the healthy level of the previous year for AOX.
Reducing the amount of wastewater Pulp: < 2020 completed Paper: < 15 m^3/t	Partly	The target of a reduction in wastewater was successfully reached at the pulp mill. The target for the paper mill was not met.
Reducing fossil carbon dioxide emissions – Reducing the use of natural gas – Increasing the use of pitching oil	Yes	Fossil carbon dioxide emissions decreased in comparison to the previous year and the use of pitch oil increased on the mead furnaces.
Improving energy efficiency – Pulp: ensuring energy self-sufficiency – Paper: reducing specific consumption of energy	Partly Yes	The pulp mill was energy self-sufficient in steam, electricity was purchased even during the turbine repair shutdown. Specific energy consumption decreased in both electricity and heat use in both pulp and paper production.
Improved reliability of odorous gas treatment at pulp mill, fugitive emissions < 2020	Yes	Emissions from emergency emissions at the odorous gas treatment plants decreased.

Targets for 2022

TARGETS	SCHEDULE	INDICATORS AND KEY MEASURES
Zero accidents	2022	LTAF (lost time accident frequency) 0. Maintaining a safety culture and implementing a safety programme.
Active precautionary safety activity	2022	600 safety observations for pulp and 700 for paper. 1,440 safety rounds and discussions for pulp and 500 for paper.
Paper mill material efficiency	2022	Fibre emissions < 6.0 t/d. Improving paper machine operability.
Reducing specific emissions from the pulp mill compared to the previous year	2022	COD and AOX kg/Adt <2021 An investment on the fibre line that will reduce emissions to the treatment plant.
Reducing the amount of wastewater	2022	Pulp: < the 2021 level Monitoring water consumption as part of daily operations. Paper: < 15 m^3/t. Ensuring the smooth running of processes.
Reducing phosphorus emissions	2022	Phosphorus discharges to the lake kg/d < 2021 target. Improving monitoring and continuing the logging trials.
Reducing fossil carbon dioxide emissions	2022	Reducing the use of natural gas. Increasing the use of alternative fuels and exploring new alternatives.
Improving energy efficiency	2022	Pulp: ensuring energy self-sufficiency. Exploiting the benefits of turbine vision. Paper: reducing specific consumption of energy. Ensuring a smooth running of the paper mill.
Solving the odour challenge of a wastewater treatment plant	2022	Number of odour days. Measurement and use of chemicals to combat odours.

EMAS
Verified environmental management
REG.NO. FI - 000058

Validation Statement

As an accredited environmental verifier (FI-V-0001), Inspecta Sertifiointi Oy has examined the environmental management system and the UPM Kaukas Environmental and Societal Responsibility Statement 2021 as well as the information concerning UPM Kaukas in the Updated UPM Group Environmental and Societal Responsibility Report 2021.

On the basis of this examination, the environmental verifier has herewith confirmed on 2022-04-08 that the environmental management system, the UPM Kaukas Environmental and Societal Responsibility 2021 statement and the information concerning UPM Kaukas in the UPM Corporate Environmental and Societal Responsibility Statement 2021 are in compliance with the requirements of the EMAS Regulation (EC) No 1221/2009.

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