UPM BIOFORE
BEYOND FOSSILS

UPM Ettringen

ENVIRONMENTAL AND SOCIETAL RESPONSIBILITY 2021


UPM Ettringen

UPM Ettringen is sited on the small Wertach river, on the outskirts of Ettringen in the Unterallgäu region in Bavaria.

Originally founded in 1897 as a mechanical pulp mill, the site has been producing paper since 1910.

The mill in Ettringen started using recovered paper as a fibre source as far back as 1963. In the 1990s, the mill set a new quality standard in the manufacture of magazine papers by developing online-calendered rotogravure and offset papers with a high recycled content.

Today, the site produces magazine papers and newsprint on one paper machine with an annual capacity of up to 300,000 tonnes.

Recovered paper is in terms of volume the most important raw material at the site. In addition to that, the mill produces and uses groundwood pulp from forest thinnings. Other raw materials used include pigments that are added as fillers to improve the printing quality of the paper.

The steam and part of the electricity for papermaking are generated in an on-site power plant, with a small share of the fuel needs provided by light fuel oil and 99% by natural gas. Fresh water is taken from the Wertach and from wells.

Wastewater is cleansed in the on-site effluent treatment plant.

Production capacity	Up to 300,000 tonnes/year
Personnel	257 (total heads as at 31 December 2021)
Products	Printing papers UPM Eco Basic UPM Eco UPM ReCat, UPM MaxS UPM Eco Prime UPM News
Certificates	EMAS – EU Eco-Management and Audit Scheme ISO 14001 – Environmental Management System ISO 9001 – Quality Management System ISO 50001 – Energy Management System ISO 45001 – Occupational Health and Safety Management 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 CertificateFinder (available at www.upm.com/responsibility)
Environmental labels	EU Ecolabel for all paper grades Blue Angel (RAL-UZ 14a or 72) for all paper grades

UPM Ettringen 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. www.upm.com

FSC www.fsc.org FSC® C014719
The mark of responsible forestry

For more information about FSC certification visit fsc.org

PEFC PEFC/02-31-80 Promoting Sustainable Forest Management www.pefc.org

For more information about PEFC certification visit pefc.org

EU Ecolabel www.ecolabel.eu
EU Ecolabel : FI/011/001

BLAUER ENGEL DAS UMWELTZEICHEN
www.blauer-engel.de/uz72

Review of year 2021

Environmental protection has been an important topic at the Ettringen site for many years. The continuous reduction of energy and water requirements, a high raw material yield for waste reduction and the use of environmentally compatible chemical additives in the production process are the focus areas of the continuous improvement process, which has been steered by management systems for the environment, quality, energy and occupational safety since the plant has been certified in accordance with international standards.

As a company of the Finnish UPM Group, we acknowledge our responsibility towards the environment and are committed to minimising the impacts of our operations on the environment and our employees.

Production and environment
As one of the first paper recyclers in Germany, we have been contributing to a circular economy for more than 50 years.

We support sustainable forestry when purchasing forest thinnings for groundwood pulp production by working according to the PEFC and FSC Standards.

Environmental performance
We are reporting on our environmental performance in a Group-wide database. Here, deviations are recorded according to predefined categories, from 1 (not significant) to 5 (serious environmental damage). As in previous years, there were no deviations in 2020 with off-site effects (Cat. 3 or higher).

In accordance with the specifications of our integrated management system for quality, environment, energy and occupational safety, we evaluate environmental impact through internal and external audits.

The demand situation stabilised again in 2021. As recovered paper was short in supply, we had to intervene massively both in our product range and in our recipes. In some cases, paper machine shutdowns were necessary to deal with the raw material shortage. These circumstances and influences affected our work towards continuously improving our performance data, costs and energy key figures.

Despite several measures to save electricity and heat (optimisation of the vacuum system + bonnet drying) the specific energy demand increased due to the higher share of groundwood pulp and the reduced efficiency of the paper machine.

At the UPM Ettringen mill, the airborne emissions are well below the statutory limits. As a paper manufacturer with a high level of water consumption, water protection is a matter of particular concern to us. The effluent treatment plant ran consistently, combining high treatment efficiency with low energy consumption.

Specific wastes from recovered paper processing increased, which was mainly due many startups and shut downs. Of the remaining residue, over 99% is recycled.

In 2021, there was one complaint about bad smell. A reason could not be found.

In the area of fire protection, the renewal of the fire alarm system was continued in 2021. The new system is expected to enable a faster response in the event of fires. The work is planned to be completed during the first quarter of 2022. Due to the pandemic, only two fire-fighting exercises could be carried out with the local fire brigade. Our employees were given theoretical fire safety training to prepare them for any fire-fighting operations.

Both our own employees and employees of contractors are trained annually in the handling of chemicals. Several walks were conducted on site to inspect the storage facilities for chemicals in more detail. The risk assessments for chemicals were revised.

Since the spring of 2015, Aviretta has producing packaging paper on the PM 4 paper machine. UPM supplies them with fresh water, demineralised water and steam. We also handle pre-treated wastewater and provide finished goods logistics.

Wolfgang Ohnesorg,

General Manager

Martin Heinrich,

Senior Specialist
Environment & Management Systems

UPM Ettringen

Contribution to UN Sustainable Development Goals in 2021

Air

Specific emissions of nitrogen oxides from power plant have been reduced by

45%

from 2012–2021

Specific sulphurdioxides emissions
(tonne per ton of paper)

42%

from 2012–2021

Specific dust emissionns
(tonne per ton of paper)

22%

from 2012–2021

Specific CO_2-emissions from power plant have been reduced by

24%

from 2012–2021

Certified fibre

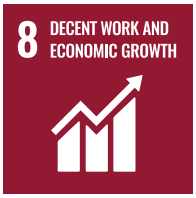
The share of thinning wood from sustainable, certified forests (PEFC + FSC) was

97%

in 2021

91%

share of recycling fibers in the produced papers.

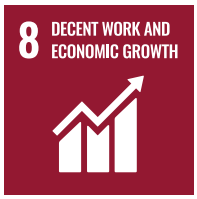


Employment

Currently

15

apprentices am UPM Ettringen site
5 paper technologists
1 automation electronics technicians
4 industrial mechanics
1 person retraining as a paper technologist
4 electronic technicians



Safety

Number of accidents with lost time have been reduced by

88%

reduziert werden.
(8 in 2012, 1 in 2021)

In 2021 our employees conducted

685

Safety observations.

Waste

99%

of the waste are recycled

Specific amount of waste (tonne per ton of paper) was reduced by

5%

from 2012–2021

Energy

Specific energy input (kWh per tonne of paper) was reduced by

14%

from 2012–2021

Air

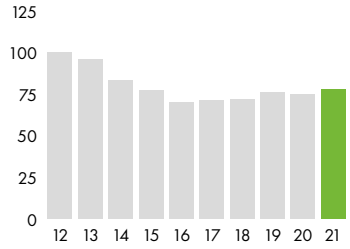
Energy generation is the main source of airborne emissions from paper mills. Annual loads could be hold steady thanks to improvements at the gas boilers.

EMISSIONS FROM THE POWER PLANT CONTINUOUS MEASUREMENT 2021

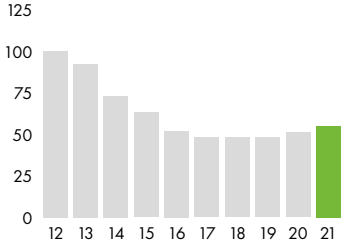
		Mean value of measurements (mg/Nm³)		
	Limit value	Boiler 3	Boiler 8 + 9	Boiler 10
Carbon monoxide, CO	50	2.0	4.5	0.4
Nitrogen oxides, NO_x	100	76	81	76
Sulphurdioxid, SO_2 (only boiler 10)	35			0.6

The following graphs show the specific air emissions of UPM Ettringen as percentage related to the year 2012.

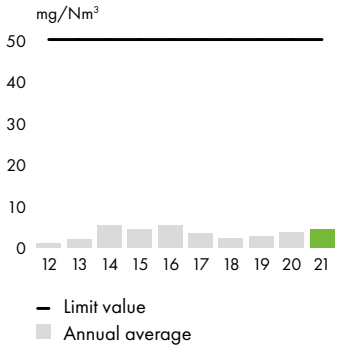
Particulate matter
Specific particulate matter emissions per tonne of paper in % in comparison with 2012



Nitrogen oxides, NO_x
Specific NO_x emissions per tonne of paper in % in comparison with 2012



Carbon monoxide, CO
Average concentration boiler 8, 9 and 10



Waste

The deinking of wastepaper is the main source of residue at UPM Ettringen. The volume of specific residue (incl. moisture) from normal production operations increased due to many startups and shut downs in comparison with the previous year.

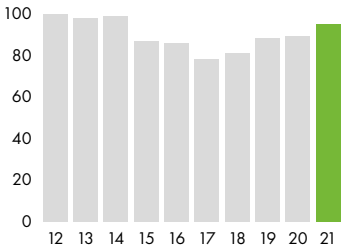
In 2021, 99.9% of all production wastes and by-products were recovered. 90% of the wastes and by-products were recycled into new materials (mainly in the brick industry).

In 2021, 99.9% of all production waste and byproducts were recovered. 90% of waste and by products went into material recycling (with main focus to brick industry).

There is only a small amount of hazardous wastes – such as oil-containing residues – which are disposed of in accordance with legal regulations.

Bark, sawdust, offcuts from logs and fibrous material from prescreening are now classified as side-products. The increased use of wood from forest thinnings resulted in an increase in the quantity of these side-products.

Specific volume of waste and side-products
(development kg/tonne of paper in %)



Landfill

The former landfill site on the mill premises was surface-sealed in 2004 and recultivated. Monitoring and evaluation during the after-closure period did not show any evidence of significant impacts on groundwater.

Water

Water is indispensable for papermaking. The water we use is recycled within the process several times, before only a fraction of it is discharged from the circuit as wastewater.

In the on-site treatment plant, the effluents are first cleansed in a chemical-mechanical and then in a biological treatment stage. The wastewater quality is analysed with online analysators as well as by our own and external laboratory analyses.

Since April of 2015, the pre-treated effluents from Aviretta have also been purified in the effluent treatment plant.

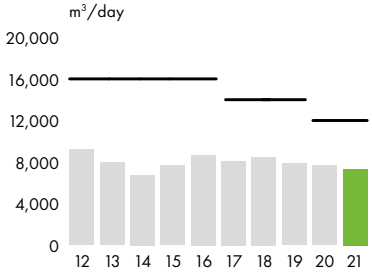
The following graphs of wastewater volume and loads refer to the total effluent volume from the treatment plant.

The daily effluent volume is clear below the limit. All discharge values are clear below the limits.

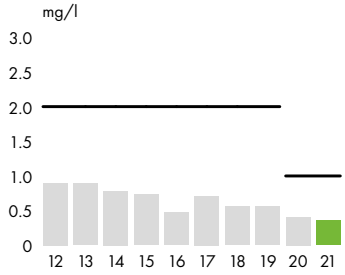
Since January 2020, a new permit is valid for the waste water treatment plant. Therein some limits have been adapted to the new regulatory requirements.

The amount of wastewater and the phosphorus concentration were able to be reduced. The other parameters are at a similar level as in the previous year.

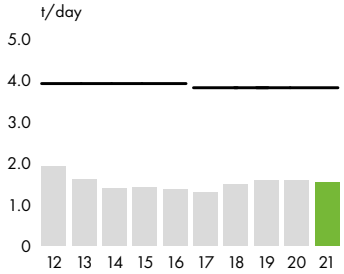
Effluent volume



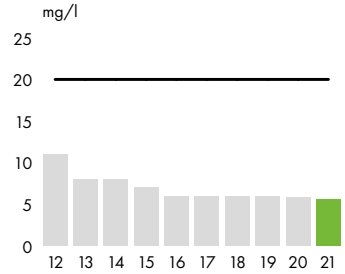
Phosphorus, P (total load)
Annual mean concentration in comparison with the limit value



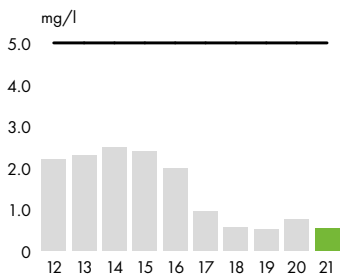
Chemical oxygen demand, COD



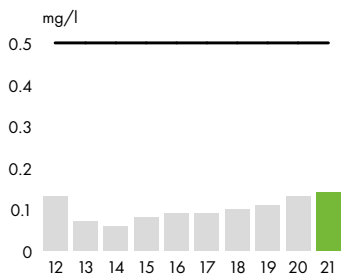
Biological oxygen demand, BOD_5
Annual mean concentration in comparison with the limit value



Nitrogen (inorganic), N
Annual mean concentration in comparison with the limit value



Adsorbable organic halogen compounds, AOX
concentration



Structure and emergency organisation

Operators in charge are appointed for environmentally relevant production plants and ancillary facilities.

As required by law, appointed officers advise the mill management and the specialist departments in the following areas: immission control, water protection, waste, hazardous goods, radiation protection and internal rail operations.

In addition, there are designated representatives responsible for the integrated management system (quality, environment, energy) and for occupational safety, fire protection and data protection.

Comprehensive emergency plans have been defined for emergencies of all kinds, such as fire, industrial accidents and environmental incidents. From alerting to immediate action and follow-up, there are guidelines to minimise the effects of an emergency as far as possible. At the emergency center (factory gate), detailed flow charts are available for different types of emergencies. For emergencies of a larger scale, there is an emergency staff who decides on any further action to be taken.

Social responsibility

Well-functioning stakeholder dialogue is a key component for success for UPM. We are committed to developing the vitality of the communities close to our operations through active co-operation and open dialogue with various stakeholders as well as, for example, through sponsorships and employee volunteering

We impact local communities and societies in many ways. Understanding the impact that we have is an essential component of our business success. In many locations, we are a significant employer, taxpayer and partner to local entrepreneurs, making positive contributions to the local economy. We apply several precautionary measures to mitigate and remedy potential negative environmental and social impacts on our surrounding communities

Occupational safety
At UPM Ettringen we aim to be an industry frontrunner in occupational health and safety. Our clear goal is zero fatal and serious accidents.

We are working to reduce or eliminate accidents in our sphere of influence through continuous improvement and effective risk management.

Through many continued actions, e.g. safety observations by all employees, we were able to reduce the number of accidents (accidents with at least one lost day) by 88 %, from 8 in 2012 to 1 in 2021.

Also in 2021 the Corona pandemic and the multitude of operational protective measures deriving from it was a focus area of our health and safety work. The crisis continued to require a high degree of responsiveness from everyone. A large number of organisational measures and regular adjustments of our production volume to the market situation were necessary. We intensified the communication with our employees, who were very understanding of the measures and kept the mill running with their flexibility. In this way, we mastered the past year well in terms of health aspects. The good cooperation with our team of company

We produce mechanical wood pulp from thinning material from sustainable certified forestry.

We take freshwater from river Wertach and we discharge cleaned waste water compliant to strict limits.

physicians and their increased presence were a supporting factor in this regard.

UPM has not yet reached its safety target, but by continuing to maintain the positive trend we aim to completely prevent any serious accidents.

Occupational healthcare
In order to strengthen our employees' health awareness, improve working conditions and thus also promote job satisfaction and motivation, we have a corporate health management with a variety of offerings:

- A bicycle leasing scheme for the employees of UPM Ettringen
- Cooperation with a corporate sports provider to offer shift workers the opportunity to take part in varied and sustainable health offerings
- Back training courses (temporarily)
- Two events where the corporate sports provider and local physiotherapists provided information on local offerings and answered individual questions.
- Digital offerings in the fields of individual nutrition coaching and personal sleep patterns.
- Height-adjustable desks to support a back-friendly working posture

Community involvement
UPM Ettringen took over sponsorship and worked in conjunction with the Ostettringen agricultural estate in a project called "Bayern blüht auf (Flowering Bavaria)", filling almost 3,600 sqm of flowering areas around the mill with insect- and bee-friendly plants to create a suitable habitat for useful insects.

Cooperation with schools and education
In 2021, one new apprentice and one retrainee started into a career as paper technologists.

For many years the paper mill has been offering students and other applicants the opportunity to do work placements, giving them insights into different careers and activities. By doing a "combined internship", they get to know available training options throughout the mill and its departments. In compliance with the Corona requirements in force at the time this was also possible in 2021.

Since papermaking has been newly included in the curriculum of the Bavarian secondary schools, some local 6th graders and their teachers visited the mill to make the subject come alive.

As an alternative to career fairs, which did not take place owing to the pandemic, themed events were held to present Gebr. Lang GmbH and the career options available at their mills to students and teachers.

UPM offers a global trainee programme that gives university graduates a career start with varied and responsible tasks. At the Ettringen mill, one female trainee started her placement in Energy and Environment.

Environmental parameters

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

		2019	2020	**2021**
Production capacity	Paper (1 paper machine)	Up to 300,000 t	Up to 300,000 t	Up to 300,000 t
Raw materials and additives	Recovered paper Round wood Fillers Processing chemicals Operating supplies	See UPM Corporate Environmental and Societal Responsibility Statement for more information		
Energy	Fossil fuels	100%	100%	99%
	Purchased power Hydropower	See UPM Corporate Environmental and Societal Responsibility Statement for more information		
Emissions to air[1]	Carbon dioxide, CO_2 (fossil)	51,231 t	47,660 t	50,153 t
	Nitrogen oxides, NO_x	18.1 t	17.7 t	19.8 t
	Sulphur dioxide, SO_2	0.3 t	0.3 t	0.3 t
	Particulate matter	0.8 t	0.7 t	0.8 t
	Carbon monoxide, CO	0.8 t	1.0 t	0.9 t
Water intake	Process-, cooling- and drinking-water	2,617,323 m^3	2,690,021 m^3	2,526,206 m^3
Discharges to water[1]	Effluent volume	2,081,219 m^3	2,215,495 m^3	2,056,074 m^3
	Chemical oxygen demand, COD	462 t	516 t	493 t
	Biological oxygen demand, BOD_5	14 t	15 t	16 t
	Phosphorus, P (total)	1.2 t	0.8 t	0.9 t
	Nitrogen (inorganic), N	1.0 t	1.7 t	1.0 t
	Adsorbable organic halogen compounds, AOX	0.2 t	0.3 t	0.3 t
	Total nitrogen bound (TNb)	9.6 t	9.9 t	8.2 t
	Total organic carbon (TOC)	147 t	158 t	158 t
Waste and side-products[2]	Side-products			
	– bark, sawdust, wood	6,590 t	5,824 t	7,392 t
	– fibre-reject prescreening	2,541 t	2,515 t	1,627 t
	Waste for recycling			
	– deinking, fibre and biological sludge	75,493 t	70,819 t	78,312 t
	– coarse deinking residue	3,060 t	2,985 t	3,572 t
	– wood	207 t	209 t	46 t
	– metal waste	214 t	230 t	304 t
	– other	914 t	606 t	1,119 t
	Waste disposal			
	– other	311 t	3 t	1 t
	Hazardous waste	77 t	34 t	56 t
Land use	Total use of land	34 ha	34 ha	34 ha
	Total sealed area	20 ha	20 ha	20 ha
	Total nature-oriented area on site	14 ha	14 ha	14 ha
	Total nature-oriented area off site	18 ha	18 ha	18 ha

[1] Here are stated the emissions, that are linked to paperproduction of UPM. Emissions that result from steam supply or co-treatment of wastewater of other companies are not listed.
[2] Quantity incl. moisture.

Performance against targets in 2021

TARGET	TARGET ACHIEVED?
1 Water	
– Convert cooling towers of WWTP to indirect cooling to reduce odour emissions. – Step 2: completion and commissioning. Check, if alternative concepts are possible (subject to investment being approved)	– Partly, project has begun; start of heat exchanger is planned for Q2-2022. Old cooling towers have been shut down in december 2021.
– Odour emissions from WWTP: Based on assessment, develop concept for odour reduction	– Yes, odour emissons from WWTP have been reduced significantly. Odour from main source sludge press was cut by more than 90% by dosing of calciumnitrate.
– Optimization of disc filter DIP3 in order to reduce amount of waste water during standstills (about 7800 m^3/year)	– Partly; 4,800 m^3/ year can be avoided.
– Look into potential fresh water savings on paper machine and calculate costs	– Concept for reuse of sealing water of vacuum pumps developed. Implementation is projected.
2 Biodiversity	
– Create flowering areas on leased agricultural areas (3.600 m^2) – Install nest boxes for different bird species on mill area. Assemble nestboxes for peregrine falcon and kestrels	– Yes, flowering areas were created. – Yes, nestboxes were built and placed.
3 Waste	
– Reduce specific losses of the deinking plant (Deinking-fibre-sludge) by 0.4 percentage points in comparison to average of 2019.	– No, target not achieved.
– Separate dehydration of preliminarily treated and activated sludge from the treatment plant. Target: reduce amount of water to be transported and transport distance by working with recyclers near the mill • Step 2: rebuild and commissioning	– Yes, concept developed, investment not yet approved.
4 Energy	
– Optimise fine screening in stage 4 of recovered paper plant (annual savings of 160 MWh)	– Yes, implemented (181 MWh/year achieved).
– Develop concept for changing wiring of fine screening in recovered paper plant to save energy	– Check showed high costs for construction, will not be followed up.
– Use new module (consumption energy management) visualising energy use of paper machine to identify potential savings.	– New module installed, not in use until now. Will be watched in 2022.
– Decommission air compressors of WWTP by connecting it to central compressed air plant (savings of 20 KW x 8000 h) (provided investment is authorized)	– Investment was not approved.
– Develop concept (with costs) for saving compressed air in micro flotation units of DIP3.	– Yes, implemented; savings are 434 MWh/year.

Targets for 2022

TARGETS AND MEASURES	DEADLINE	DEPARTMENT RESPONSIBLE
1 Water		
– Reuse of sealing water from vacuum pumps. Saving: 20.000 m^3/ year.	31.12.22	Head of Production
2 Biodiversity		
– Create flowering areas on leased agricultural areas (3.600 m^2)	30.06.22	Environmental Officer
– Upgrade ecological compensation area by improved care concept.	31.12.22	Environmental Officer
3 Waste		
– Separate dehydration of preliminarily treated and activated sludge from the treatment plant. Target: reduce amount of water to be transported and transport distance by working with recyclers near the mille • Step 2: rebuild and commissioning (subject to investment being approved)	31.12.2022	Manager Effluent Treatment Plant
4 Energy		
– Concept for optimized drying of pressurized air	31.12.2022	Head of Maintanance
– Concept for energy savings for high-pressure-water-pumps	31.12.2022	Head of Production
– Install and use new module for visualising energy use of paper machine.	31.12.2022	Head of Production
– Decommission air compressors of WWTP by connecting to central air plant (savings of 20 kW x 8000 h; provided investment is authorized)	31.05.2022	Manager Effluent Treatment Plant
– Generate energy flow chart for electricity and heat to increase awareness for energy efficiency.	31.05.2022	Dir. Operations + Graduate Energy/Environment
– Evaluate influencing factors for energy-key-factors in detail.	31.05.2022	Dir. Operations + Graduate Energy/Environment
– Battery-charging station for employees (precondition: green electricity)	2023	Dir. Operations

EMAS
Verified environmental management
REG.NO. FI - 000058

Environmental verifier's declaration on verification and revalidation activities

Environmental verifier Astrid Günther (DE-V-0357), acting for TÜV NORD CERT Umweltgutachter GmbH, licensed for the scope NACE Code 17.12 (papermaking), declares to have verified whether UPM Ettringen (the site Gebr. Lang GmbH Papierfabrik), Fabrikstrasse 4, 86833 Ettringen, Germany, as indicated in the updated UPM Corporate Environmental and Societal Responsibility Statement 2021 of the mentioned site (registration no. FI-000058), meets all requirements of Regulation (EC) No 1221/2009 of the European Parliament and of the Council of 25 November 2009 as amended by Regulation (EU) 2017/1505 and Regulation (EU) 2018/2026 of the comission on the voluntary participation by organisations in a Community Eco-Management and Audit Scheme (EMAS).

By signing this declaration, I declare that:
– the verification and validation has been carried out in full compliance with the requirements of Regulation (EC) No 1221/2009,
– the outcome of the verification and validation confirms that there is no evidence of non-compliance with applicable legal requirements relating to the environment,
– the data and information of the updated Environmental Statement 2021 of UPM Ettringen (the site Gebr. Lang GmbH Papierfabrik) reflect a reliable, credible and correct image of all the activities of UPM Ettingen (the site Gebr. Lang GmbH Papierfabrik) within the scope mentioned in the updated UPM Corporate Environmental and Societal Responsibility Statement 2021.

This document is not equivalent to EMAS registration. EMAS registration can only be granted by a Competent Body under Regulation (EC) No 1221/2009. This document shall not be used as a stand-alone piece of public communication.

Essen, 12th April 2022

Astrid Günther
Environmental verifier
DE-V-0357
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UPM

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6/2022