UPM BIOFORE
BEYOND FOSSILS

UPM Ettringen

ENVIRONMENTAL AND SOCIETAL RESPONSIBILITY 2022

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.

In terms of volume, recovered paper is 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	248 (total heads as at 31 December 2022)
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 Certificate Finder (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 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

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 the year 2022

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 60 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 2022 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 capacity utilisation of the paper machine was very good in the first half of the year due to the strike in Finland. Due to the massive increases in paper prices, demand for SC paper fell significantly in the second half of the year. The corresponding paper machine downtimes led to a deterioration of the specific energy key figures in the second half of the year. The continuous improvement in the first half of the year was more than compensated for.

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, the specific energy demand rose due to increased downtimes and lower paper grammage.

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 to many startups and shutdowns. Of the remaining residue, over 99% is recycled.

In 2022, there was one complaint about noise. A reason could not be found.

In 2022, a total of 75 employees were trained as fire safety assistants. In addition to acquiring theoretical knowledge, they also learnt how to use jet pipes and fire extinguishers with practical exercises. Several exercises took place at the mill with the Ettringen volunteer fire brigade. The fire detection system was successfully overhauled; it runs smoothly and gives us a time advantage in the event of fire.

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

Since the spring of 2015, Aviretta has been producing packaging paper on the PM 4 paper machine. UPM supplies Aviretta 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 2022

Air

Specific emissions of nitrogen oxides from the power plants have been reduced by

41%

from 2013–2022

Specific sulphur dioxide emissions (t per tonne of paper) have decreased by

22%

from 2013–2022

Specific dust emissions (t per tonne of paper) have been reduced by

17%

from 2013–2022

Specific CO_2 emissions from the power plants have been reduced by

15%

from 2013–2022

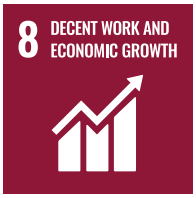
Certified fibre

In 2022, the share of thinning wood from sustainable, certified forests (PEFC + FSC) was

98%

92%

share of recycling fibres in the paper we produced in 2022.

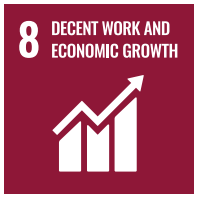


Employment

Currently

16

apprentices at the site
4 paper technologists
1 electronic technician
4 automation electronics technicians
6 industrial mechanics
1 person retraining as a paper technologist



Safety

Number of accidents with lost time have been reduced by

60%

(5 in 2013, 2 in 2022)

In 2022, our employees conducted

600

safety observations.

Energy

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

13%

from 2013–2022

Waste

99%

of all waste and by-products are recycled 2013–2022

Biological diversity

3,600 m²

of flowered areas

11

nesting boxes for different bird species on the mill premises

An optimised cultivation concept has been introduced over

52,000 m²

of compensation areas

Air

Energy generation is the main source of airborne emissions from paper mills.

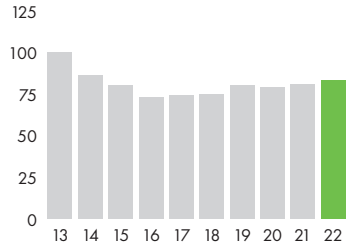
Optimisation of the gas boilers in recent years has kept the annual nitrogen oxide load at a low level.

EMISSIONS FROM THE POWER PLANT: CONTINUOUS MEASUREMENT IN 2022

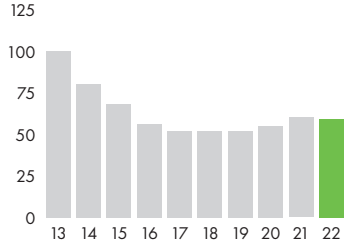
		Mean value of measurements (mg/Nm³)		
	Limit value	Boiler 3	Boilers 8 + 9	Boiler 10
Carbon monoxide, CO	50	3.0	3.2	1
Nitrogen oxides, NO_x	100	73	78	78
Sulphur dioxide, SO_2 (only boiler 10)	35			0.1

The following graphs show the specific air emissions of UPM Ettringen as a percentage relating to the year 2013.

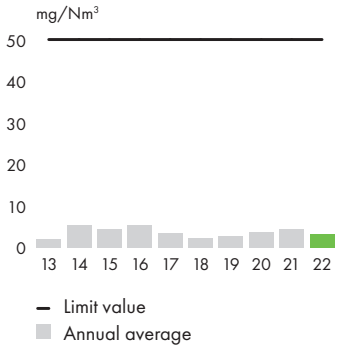
Particulate matter
Specific annual load per tonne of paper in % in comparison with 2013



Nitrogen oxides, NO_x
Specific annual loads per tonne of paper in % in comparison with 2013



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



Waste

The deinking of recovered paper is the main source of residue at UPM Ettringen. The specific volumes of waste and by-products (incl. bark) have increased.

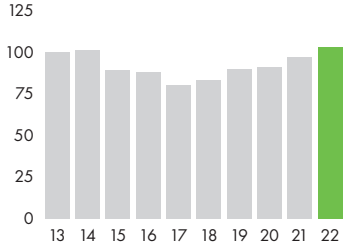
The sludge from the effluent treatment plant has increased in particular, as have the residues from recovered paper processing due to the paper being of poorer quality.

In 2022, 99.9% of all production waste and by-products were recovered. 90% of waste and by-products were recycled into new materials (mainly in the brick industry).

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

Bark, sawdust, offcuts from logs and fibrous material from prescreening are now classified as by-products. Reusable containers for food are now offered in the canteen.

Specific volume of waste + by-products
development in 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 the 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. Fresh water is sourced from the Wertach and our own wells.

In the on-site treatment plant, the effluents are cleansed firstly in a mechanical and then in a biological treatment stage. The wastewater quality is analysed using various online analysers, as well as our own and external laboratory analyses.

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

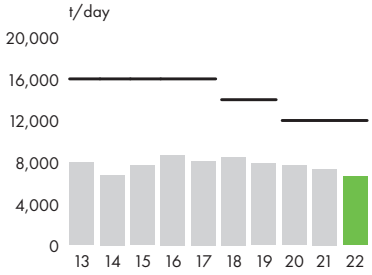
The following graphs of wastewater volume and loads refer to the total effluent volume from the treatment plant.

All the discharge values are clearly below the limits.

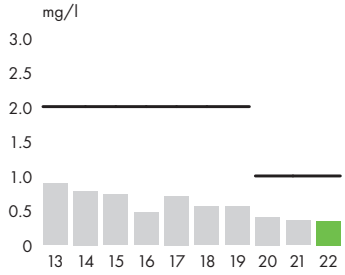
Since 1 January 2020, a new permit has been valid for the wastewater treatment plant. Some limits have been adapted to the new regulatory requirements.

In 2022, the wastewater cooling system was converted to indirect cooling via heat exchangers. This reduces possible odour emissions. The wastewater volume has decreased due to the reduced production output. All concentration values are well below the relevant limits.

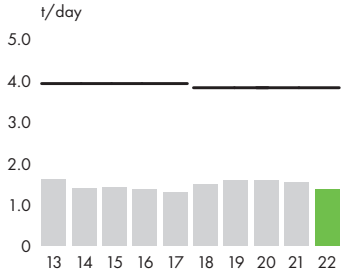
Effluent volume



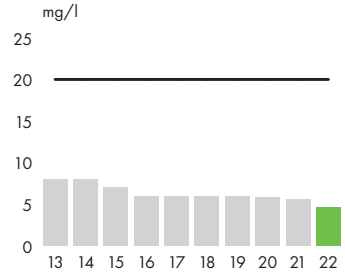
Phosphorus, P total
Annual mean concentration in comparison with the limit value



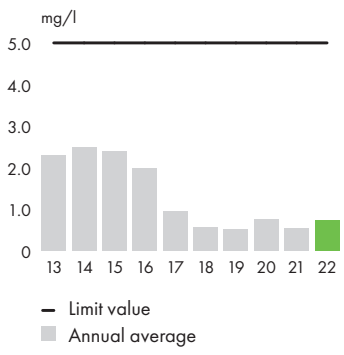
Chemical oxygen demand, COD



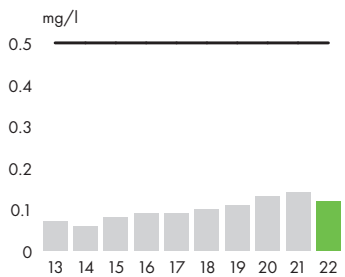
Biological oxygen demand, BOD_5
Annual mean concentration in comparison with the limit value



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 centre (factory gate), detailed flow charts are available for different types of emergencies. For emergencies on a larger scale, there are emergency staff who decide 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 cooperation and open dialogue with various stakeholders, as well as 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 a positive contribution to the local economy. We apply precautionary measures to mitigate and remedy any 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.

In the process, we have also paid increasing attention to reporting positive events. For example, the Ettringen mill was put forward for the UPM Safety

Recovered paper and thinning wood from sustainable forestry are our most important raw materials.

Many flowers bloom on the compensation areas and on the landfill site, not least due to the adapted landscaping strategy.

Award and was included in the Frontrunner Club. Dealing with occupational health and safety issues is part of our management culture and is further cultivated through various events. For example, all managers were invited to the "Heroes of Occupational Safety" cabaret.

We have had hardly any accidents in Ettringen for many years now, but unfortunately we had two last year and consequently did not reach the UPM target. Work is continuing to maintain the positive trend and avoid serious accidents entirely.

Occupational healthcare
There is a wide range of initiatives to promote occupational health at the Ettringen site: In 2022, these included running the regular spine care session and holding a health day on the subject of bioimpedance analysis.

Through our collaboration with a corporate sports provider, employees can also work on their health in a fully flexible way or use their commute as a workout under the bicycle leasing scheme.

There have been several digital health campaigns, such as on resilience, bowel cancer screening and spine health. Even more workstations were equipped with height-adjustable desks.

Biodiversity
The sponsorship of approximately 3,600 m² of flowering areas as part of the "Bayern blüht auf" (Flowering Bavaria) campaign has continued. In cooperation with the Ostettringen agricultural estate, insect- and bee-friendly plants were sown around the company premises to create a suitable habitat for these useful insects.

In 2021, nesting boxes for various bird species were hung on the mill premises.

Since 2022, some 15% of the meadows on the compensation areas to the east of the mill have not been mowed on annual rotation. The aim is to improve the living conditions for insects.

Cooperation with schools and education
Autumn 2022 saw four trainees start at the Ettringen site. For many years now, UPM Ettringen, Gebr. Lang GmbH Papierfabrik has been offering students and other applicants the opportunity to complete work placements in different areas and get to know the paper mill better during visits and factory tours.

By participating in vocational training fairs and themed evenings in the region, as well as campaigns such as Girls' Day, our trainees provide insights into the careers on offer and their requirements in direct exchange with students and teachers.

Environmental parameters

Data on production volumes and the consumption of raw material and energy, as well as all specific indicators per tonne of paper, are published as aggregated figures on group level in the Corporate Environmental and Societal Responsibility Statement for pulp and paper mills.

		2020	2021	**2022**
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 Process chemicals Operating supplies	See information in the joint part of the Corporate Environmental and Societal Responsibility Statement		
Energy	Fossil fuels	100%	99%	100%
	Purchased power Hydropower	See information in the joint part of the Corporate Environmental and Societal Responsibility Statement		
Air emissions[1]	Carbon dioxide, CO_2 fossil (direct, scope 1)	47,660 t	50,153 t	46,658 t
	Carbon dioxide, CO_2 fossil (indirect, scope 2)	146,946 t	118,971 t	108,858 t
	Nitrogen oxides, NO_x	17.7 t	19.8 t	17.2 t
	Sulphur dioxide, SO_2	0.3 t	0.3 t	0.3 t
	Particulate matter	0.7 t	0.8 t	0.7 t
	Carbon monoxide, CO	1.0 t	0.9 t	0.7 t
Water intake	Process, cooling and drinking water	2,690,021 m^3	2,526,206 m^3	2,567,340 m^3
Discharges to water [1]	Effluent volume	2,215,495 m^3	2,056,074 m^3	2,167,997 m^3
	Chemical oxygen demand, COD	516 t	493 t	474 t
	Biological oxygen demand, BOD_5	15 t	16 t	11 t
	Phosphorus, P total	0.8 t	0.9 t	0.8 t
	Nitrogen (inorganic), N	1.7 t	1.0 t	1.4 t
	Adsorbable organic halogen compounds, AOX	0.3 t	0.3 t	0.3 t
	Total nitrogen bound (TNb)	9.9 t	8.2 t	7.7 t
	Total organic carbon (TOC)	158 t	158 t	161 t
Waste and by-products [2]	By-products			
	– bark, sawdust, wood	5,824 t	7,392 t	6,061 t
	– fibre-reject prescreening	2,515 t	1,627 t	1,433 t
	Waste for recycling			
	– deinking, fibre and biological sludge	70,819 t	78,312 t	73,203 t
	– coarse deinking residue	2,985 t	3,572 t	3,415 t
	– wood	209 t	46 t	25 t
	– metal waste	230 t	304 t	241 t
	– other	606 t	1,119 t	538 t
	Waste for disposal			
	– other	4.1 t	0.2 t	0.2 t
	Hazardous waste	34 t	56 t	50 t
Land use	Total land use	34 ha	34 ha	34 ha
	Sealed area	20 ha	20 ha	20 ha
	Nature-oriented area on-site	14 ha	14 ha	14 ha
	Nature-oriented area off-site	18 ha	18 ha	18 ha

[1] The emissions associated with UPM's paper production are stated here. Emissions resulting from the steam supply or co-treatment of wastewater from other companies are not listed.
[2] Quantity incl. moisture.

Performance against targets in 2022

TARGETS	TARGET ACHIEVED
1 Wastewater	
– Reuse of sealing water from vacuum pumps. Saving: 20,000 m³/year.	– Yes, converted in Dec. 2022. Saving of 20,000 m³/year
2 Biodiversity	
– Create flowering areas on leased agricultural areas (min. 3,600 m²)	– Yes, implemented
– Upgrade ecological compensation areas through improved cultivation concept	– Yes, implemented
3 Waste	
– Separate drainage of pre-treated and activated sludge from the treatment plant	– No, investment was not approved. Has been re-applied for in 2023
4 Energy saving + climate protection	
– Create a concept for optimised drying of compressed air	– Yes, concept created; framework conditions have changed. Needs to be replanned.
– Energy-saving/optimisation concept for high-pressure pumps	– Yes, new high-pressure pump delivered, not installed yet
– Install and use a new module (consumption/energy management) for visualising paper machine energy use	– In progress, will be implemented in 2023
– Decommission treatment plant air compressors by connecting to a central compressed air plant. (savings of 20 kW x 8,000 h) (subject to investment being approved)	– No, investment was not approved
– Create an energy flow chart for electricity and heat to increase awareness of energy consumption	– Yes, is sent monthly with energy key figures
– Determine contributing factors for energy key figures (standardisation) in more detail	– Yes, has been determined
– E-charging station for employees (green electricity required), date 2023	– Concept will be created

Current targets

TARGETS AND MEASURES	DEADLINE	DEPARTMENT RESPONSIBLE
1 Wastewater		
– Reduce sealing water in DIP3 from 6.75 l/s to 2 l/s during multi-day downtimes	30/03/2023	Head of Production
– Create a concept for recirculating the condensate of heat recovery PM 5 into fresh water	31/12/2023	Head of Production
2 Biodiversity		
– Create flowering areas on leased agricultural areas (min. 3,600 m²)	30/06/2023	Environmental Officer
– Upgrade ecological compensation areas through improved cultivation concept	30/09/2023	Environmental Officer
3 Waste		
– Separate drainage of pre-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: Conversion and commissioning (subject to investment being approved)	31/12/2023	Manager Effluent Treatment Plant
4 Energy saving + climate protection		
– Build a power-to-heat boiler. Saving: approx. 7,700 t CO_2/year (from 2024)	31/12/2023	Head of Production
– Reduce DIP3 downtimes (electricity) from 0.45 MWh to 0.1 MWh during multi-day downtimes	31/12/2023	Head of Production
– Optimise DIP3 cooling tower temperature settings to reduce fan power consumption (approximately 150 MWh depending on water and air temperature)	31/12/2023	Head of Production
– Optimise fresh water/hot water control concept to minimise use of steam in hot water heating	31/12/2023	Head of Production
– Communication about energy issues: distribute energy brochure and thermometer to employees	31/12/2023	Energy Management representative
– E-charging station for employees: creating concept (green electricity required)	31/12/2023	

EMAS
Verified environmental management
REG.NO. FI - 000058

Environmental verifier's declaration on verification and revalidation activities

The undersigned EMAS environmental verifier Astrid Günther (DE-V-0357), acting for the environmental audit organisation "TÜV NORD CERT Umweltgutachter GmbH", licensed for the area NACE Code 17.12 (papermaking), declares to have verified whether UPM Ettringen (the site Gebr. Lang GmbH Papierfabrik), as indicated in the updated Corporate Environmental and Societal Responsibility Statement 2022 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 Commission 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 have 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 Corporate Environmental and Societal Responsibility Statement 2022 of UPM Ettringen (the site Gebr. Lang GmbH Papierfabrik) reflect a reliable, credible and correct image of all the activities of UPM Ettringen (the site Gebr. Lang GmbH Papierfabrik) within the scope mentioned in the updated Corporate Environmental and Societal Responsibility Statement 2022.

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 standalone piece of public communication.

Essen, 26 July 2023

Astrid Günther
Environmental verifier
DE-V-0357
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10/2023