

UPM Ettringen

Environmental and Societal Responsibility 2017



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	About 257 (total heads as at 31 December 2017)
Products	Printing papers UPM EcoBasic UPM Eco H UPM Eco G 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 OHSAS 18001 – Occupational Health and Safety System PEFC™ Chain of Custody – Programme for the Endorsement of Forest Certification FSC® Chain of Custody – Forest Stewardship Council® All certificates can be found from UPM's Certificate Finder (available at www.upm.com/responsibility)
Environmental labels	EU Ecolabel for all paper grades Blue Angel (RAL-UZ 14 or 72) for all paper grades



UPM Ettringen Environmental and Societal Responsibility 2017 is a supplement to the Corporate Environmental Statement of UPM's pulp and paper mills (available at www.upm.com) and provides mill-specific environmental performance data and trends for the year 2017. The annually updated mill supplements and the UPM Corporate Environmental Statement together form the joint EMAS Statement of UPM Corporation. The next Corporate Environmental Statement and also this supplement will be published in 2019.

UPM leads the forest-based bioindustry into a sustainable, innovation-driven, and exciting future across six business areas: UPM Biorefining, UPM Energy, UPM Raflatac, UPM Specialty Papers, UPM Paper ENA and UPM Plywood. Our products are made of renewable raw materials and are recyclable. We serve our customers worldwide. The group employs around 19,100 people and its annual sales are approximately EUR 10 billion. UPM shares are listed on NASDAQ OMX Helsinki. UPM – The Biofore Company – www.upm.com



For FSC certified products please see www.fsc.org



For PEFC certified products please see www.pefc.org



EU Ecolabel : FI/011/001



www.blauer-engel.de/uz72

Review of the year 2017

Production and environment

The papermaking processes at the UPM Ettringen site have been continuously optimised through the years in order to, among other things, minimise their impacts on the environment. Since 2004 we have been working with an environmental management system that is certified and validated annually under ISO 14001 and the EU Eco-Management and Audit Scheme (EMAS).

As one of the first paper recyclers in Germany, the UPM Ettringen mill has over 40 years of experience in the fields of sustainability and circular economy. These two concepts drive our corporate policies in a comprehensive sense. They require ecological, economic and social aspects to be given equal consideration.

We support sustainable forestry in our virgin fiber use by working according to the PEFC and FSC standards.

In 2010, our energy management system gained certification. Also last year we successfully implemented several projects to reduce energy consumption. In spite of some smaller projects to save energy, specific energy consumption increased due to more demanding quality requirements on groundwood and recovered fibre pulp. Steam consumption was also up, as some steam had to be dis-charged unused due to technical failures of steam consumers.

At the UPM Ettringen mill, the airborne emissions are well below the statutory limits.

As a paper producer 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.

The recycling of wastepaper is the main source of residue at the mill. Over 99% of the remaining residue is recovered.

In 2017 there was one complaint from the neighbourhood About noise from railway traffic.

Since the spring of 2015, Aviretta has been producing packaging paper on the PM4 paper machine. UPM supplies them with fresh water, demineralised water and steam. We also handle pre-treated wastewater and provide finished goods logistics.



A handwritten signature in black ink, appearing to read 'W. Ohnesorg'.

Wolfgang Ohnesorg,
General Manager



A handwritten signature in black ink, appearing to read 'M. Heinrich'.

Martin Heinrich, Senior Specialist
Environment & Management Systems

Responsibility figures 2017

Waste



99.9%

of the waste are recycled

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

46%

from 2007–2017

Energy



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

34%

from 2007–2017

Water



Specific load of organic
matter in cleaned wastewater
(tonne COD per tonne of paper)
was reduced by

36%

from 2007–2017

Specific load of phosphor
in cleaned wastewater
(tonne phosphor per tonne of paper)
was reduced by

32%

from 2007–2017

Specific amount of wastewater
(m³ per tonne of paper)
was reduced by

12%

from 2007–2017

Air



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

82%

from 2007–2017

Specific CO₂-emissions from power plant have been reduced by

49%

from 2007–2017

Safety



Number of accidents with lost time have been reduced by

93%

reduziert werden.
(29 in 2007, 2 in 2017)

In 2017 our employees conducted

453

Safety walks

Employment



Currently

22

apprentices am UPM Ettringen site

Fiber raw material



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

87%

In 2017

96%

share of recycling fibers in the produced papers

Health

Participation in health trainings
Yoga

142

participant hours 2017

Back-strengthening
exercises

232

participant hours 2017

Air



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

Annual loads declined further thanks to improvements at the gas boilers.

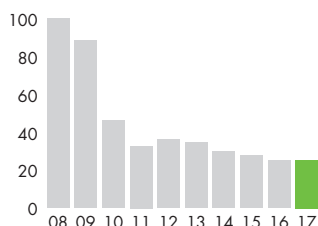
EMISSIONS FROM THE POWER PLANT CONTINUOUS MEASUREMENT

	Limit value	Mean value of measurements (mg/Nm ³)		
		Boiler 3	Boiler 8 + 9	Boiler 10
Carbon monoxide, CO	50	1.3	4.8	0.9
Nitrogen oxides, NO _x	100	80	77	57

The following graphs show the specific air emissions of UPM Ettringen as percentage related to the year 2008.

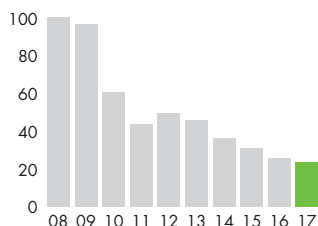
Particulates

Specific particulate matter emissions per tonne of paper in % in comparison with 2008



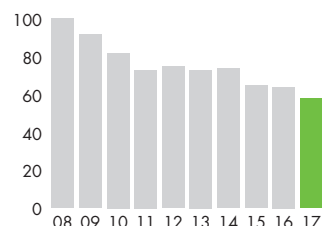
Nitrogen oxides, NO_x

Specific NOX emissions per tonne of paper in % in comparison with 2008



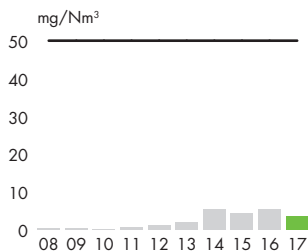
Specific volume of waste

(development kg/tonne of paper in %)



Carbon monoxide, CO

Average concentration boiler 8, 9 and 10



— Limit value
■ Annual average

Boiler for natural gas in powerplant.

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 decreased slightly in comparison with the previous year.

In 2017, 99.9% of all production waste was recovered. 76% 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.

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. If necessary, they are then treated with ozone to break not readily degradable substances (such as the lignin in the wood) into simpler forms, which can subsequently be removed by biofiltration.

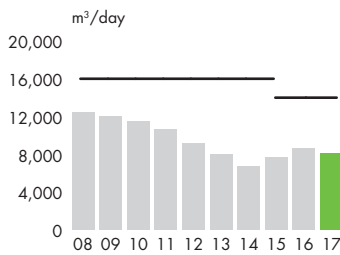
Since April of 2015, the pre-treated effluents from Aviretta have also been purified in the effluent treatment plant.

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

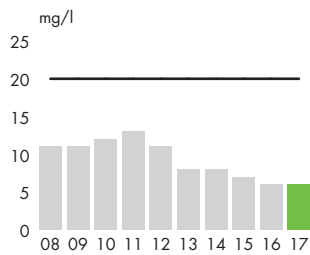
The reduction of nitrogen is in consequence of changes in analysis method. Since July 2016, a new permit is valid for the waste water treatment plant. Therein some limits have been adapted to the new conditions with lower effluent volume.



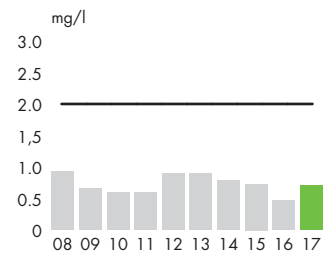
Process wastewater volume



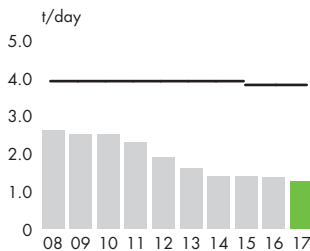
Biological oxygen demand, BOD₅
Annual mean concentration with the limit



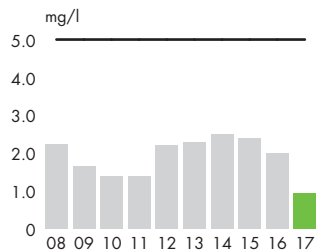
Phosphorus, P (total load)
Annual mean concentration in comparison with the limit value



Chemical oxygen demand, COD



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



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 adverse impacts on groundwater.



Societal responsibility

Occupational safety

At the Ettringen mill we have for many years been working to improve occupational safety. In the course of the safety campaign launched by UPM in 2012, we implemented safety standards that go beyond the statutory requirements. There are safety walks by managers, targeted safety discussions and the reporting of safety observations to sharpen the awareness of all employees regarding unsafe conditions and practices. We actively share information, particularly on high risk accidents and incidents, with other UPM mills and carry out cross-site safety audits in order to learn from others without having to experience problems ourselves and to identify risks in advance.

In 2017, we paid particular attention to six of the implemented safety standards. Throughout the year, there were special activities, training and events focusing on these six Life Saving Standards, including "Working at Height", "Risk

Assessments", "Permit to Work", "Confined Spaces", "Lock out/Tag out" and "Mobile Equipment and Cranes". Overall, our LTAF (number of serious work-related personal injuries that result in more than one day off work per million of work hours) decreased from 13.4 in 2012 to 5.31 in 2017.

However, we are not there yet. We are still working to further reduce LTAF and prevent all serious accidents. In order to achieve this target, we are planning to standardize high risk processes, carry out even more detailed risk assessments, promote a better understanding of the risks associated with working at height and highlight occupational safety as a management responsibility.

Occupational healthcare

We spend a large portion of our lives at the workplace, whose conditions can affect our health positively or negatively. A healthy, resilient and motivated workforce is prerequisite for the success and

competitiveness of our mills. Therefore, we want to create a work environment that is conducive to our employees' good health and to deepen their health awareness to promote and maintain their job satisfaction and motivation.

We have therefore implemented a corporate health management scheme comprising a variety of offers:

- We implemented a bicycle leasing system to which many employees have signed up
- There are weekly back training and yoga classes
- A health day was held where information was provided on allergies and lung and skin function tests were carried out in cooperation with health insurance providers
- We launched a so-called workplace programme to improve workplace ergonomics and find out how employees can maintain and improve their wellbeing through physical exercise at the workplace





Community involvement

Last year UPM Ettringen sponsored "Kulturgut", a series of concerts organized by Aktion Hoffnung in Ettringen. With the proceeds, Aktion Hoffnung supports education for Syrian child refugees in the Bekaa valley in Lebanon. More than 1,300 children are being prepared for integration into schools.

The local fire brigade got a subsidy for protective clothing.

Cooperation with schools and education

As part of the Allgäu professional education initiative, 38 eighth-grade

students from Wörishofen visited UPM Ettringen to learn about the trade careers offered at our mill.

At UPM Ettringen, we are currently training automation electronics technicians, industrial technicians and paper technologists. These careers were presented by apprentices at the Türkheim middle school and at professional education fairs in Bad Wörishofen, Memmingen and Landsberg.

Moreover, UPM Ettringen is involved in the work group "Schule/Wirtschaft Unterallgäu", including representatives from schools, industry, chambers of

industry and commerce, the German Employment Agency, public agencies and the press. The work group's focus is on building, maintaining and developing a network for linking schools with industry. Its work has resulted in cross-functional cooperation, joint events and learning from each other. Mill visits were organized to provide students from neighboring schools with insights into the basic and auxiliary processes of papermaking.



Environmental parameters 2017

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 Statement. The following values represent the environmental data of UPM Ettringen.

Production capacity	Paper	Up to 300,000 t (1 paper machine)
Raw materials and additives	Recovered paper Round wood Fillers Processing chemicals Operating supplies	See UPM Corporate Environmental Statement for more information
Energy	Fossil fuels Purchased power Hydropower	100% See UPM Corporate Environmental Statement for more information
Emissions to air	Carbon dioxide, CO ₂ (fossil) Nitrogen oxides, NO _x Sulphur dioxide, SO ₂ Particulate matter Carbon monoxide, CO	53,178 t 19.2 t 0.3 t 0.8 t 0.9 t
Water intake	Process-, cooling- and drinking-water	3,016,407 m ³
Discharges to water	Effluent volume Chemical oxygen demand, COD Biological oxygen demand, BOD ₅ Phosphorus, P (total) Nitrogen (inorganic), N Adsorbable organic halogen compounds, AOX	2,263,526 m ³ 355 t 13 t 1.6 t 2.0 t 0.20 t
Waste*	Total volume (without hazardous waste) of which – deinking, fibre and biological sludge – coarse deinking residue – bark and wood – metal waste – other Hazardous waste Recovery rate	77,617 t 73,182 t 3,577 t 157 t 275 t 426 t 42 t 99,9%
Size of mill area	Built on or sealed	33 ha

* incl. moisture



Performance against targets in 2017

TARGET	ACHIEVEMENT
1 Water Maintain voluntarily reduced (by 20%) COD concentration discharged from the treatment plant (control value) to the Wertach river	Yes, the reduced value for COD concentration was kept all the time.
2 Energy Reduce specific steam and power consumption by 2.5% in comparison with the previous year	No, Partly, reduction specific power consumption increased due to higher quality requirements of mechanical pulp and deinked recycling fibres. Steam consumption increased due to numerous technical breakdowns.
3 Waste Reduce specific losses of the deinking plant (Deinking-fibre-sludge) by 1.4 percentage points in comparison to average of the years 2014 to 2016	Partly, reduction of 1.1 percentage points achieved.
4 Airborne emissions Reduce average concentration of Nitrogen oxides from gas boilers by 2% in comparison to 2016	Yes, reduction by 12% was achieved (weighted according run-time over all gas fired boilers)
5 Efficiency Increase overall efficiency of the paper machine (target to be defined internally within the framework of the target setting process)	No, target was missed due to technical breakdowns.

Targets for 2018

TARGETS AND MEASURES	DEADLINE	DEPARTMENT RESPONSIBLE
1 Water Maintain voluntarily reduced (by 20%) COD concentration discharged from the treatment plant (control value) to the Wertach river	31.12.2018	Manager Effluent treatment plant
2 Waste Reduce specific losses of the deinking plant (Deinking-fibre-sludge) by 0.4 percentage points in comparison to average of the year 2017	31.12.2018	Manager Deinking plant
3 Energy – Reduce steam usage in making hot water for paper machine 5 by 18 MWh/year. – Safe 170 MWh electric power/year by optimising three agitators. – Reduce specific steam consumption of the paper mill by 1.5% in comparison with the previous year	31.12.2018	Manager Paper machine Manager Deinking plant Manager Power plant
4 Efficiency Reduce paper broke during change of reel spools by 15% via optimised control	31.12.2018	Manager Paper machine



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 Environmental Statement 2017 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 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 2017 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 Environmental Statement 2017.

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, 06.04.2018

Astrid Günther
 Environmental verifier
 DE-V-0357
 TÜV NORD CERT Umweltgutachter GmbH



www.upm.com

**Gebr. Lang GmbH Papierfabrik
(UPM Ettringen)**

Fabrikstrasse 4
86833 Ettringen
Germany
Tel. +49 8249 802-0
Fax +49 8249 802-119

**For further information,
please contact:**

Wolfgang Ohnesorg
General Manager
Tel. +49 8249 801-100

Martin Heinrich
Senior Specialist Environment &
Management Systems
Tel. +49 8249 802-340
E-mail: info.ettringen@upm.com