

Environmental performance in 2016



UPM Ettringen



Through the renewing of the bio and forest industries, UPM is building a sustainable 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 19,300 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

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.

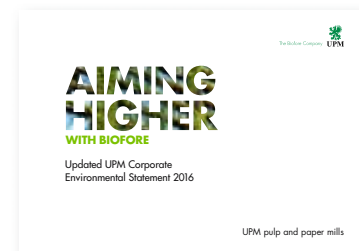
Recovered paper is in terms of volume the most important raw material at the site. In addition to that, the mill produces and uses groundwood pulp from forest thinnings. Other raw materials used include pigments that are added as fillers to improve the printing quality of the paper.

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 282 (total heads as at 31 December 2016)
Products	Printing papers UPM Eco Basic UPM Eco H UPM Eco G UPM Eco Prime UPM News
Certificates	EMAS – EU Eco-Management and Audit Scheme ISO 14001 – Environmental Management System Standard ISO 9001 – Quality Management System Standard ISO 50001 – Energy Management System Standard OHSAS 18001 – Occupational Health and Safety System Standard PEFC™ Chain of Custody – Programme for the Endorsement of Forest Certification FSC® Chain of Custody – Forest Stewardship Council® <i>All certificates can be found from UPM's Certificate Finder (available at www.upm.com/responsibility)</i>
Environmental labels	EU Ecolabel (EU Flower) for all paper grades Blue Angel (RAL-UZ 14 or 72) for all paper grades



UPM Ettringen Environmental Performance in 2016 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 2016. 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 2018.



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EU Ecolabel : FI/011/001



Environmental year 2016

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 fibre 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. Thus the specific energy consumption per tonne of paper was reduced by 7.1% concerning steam and 3.8% concerning electricity in comparison with 2015.

Lower energy consumption reduces airborne emissions. At the UPM Ettringen mill, they 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.

There were no complaints from the neighbourhood in 2016.

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.

Occupational health and safety

Intensive work continued to strengthen our occupational health and safety culture. Special focus was on improving the assessment of risks prior to starting a job through a permits-to-work system and ad-hoc risk assessments. In the field of health management, proven activities such as health day, workplace programmes and back-strengthening exercises continued. Many employees used the opportunity to lease bicycles under the business bike scheme.

Community involvement

Last year, UPM Ettringen supported, amongst other things, a school, a cultural event and the purchase of a defibrillator for a sports club near the mill.



Wolfgang Ohnesorg,
General Manager



Martin Heinrich, Senior Specialist
Environment & Management Systems

Air

Energy generation is the main source of airborne emissions from paper mills. Annual loads declined further thanks to

increased energy efficiency and improvements to the gas boilers.

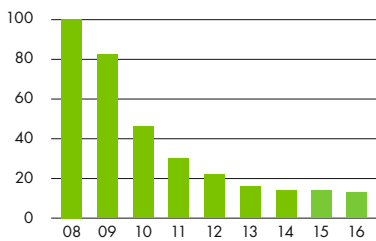
Emissions from the power plant Continuous measurement

	Limit value (mg/Nm ³)	Mean value of measurements (mg/Nm ³)		
		Boiler 3	Boiler 8 + 9	Boiler 10
Carbon monoxide, CO	50	1,3	5,9	2,1
Nitrogen oxides, NO _x	150	81	84	61

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

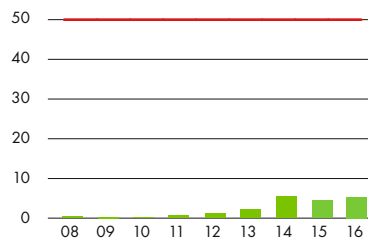
Particulate matter

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



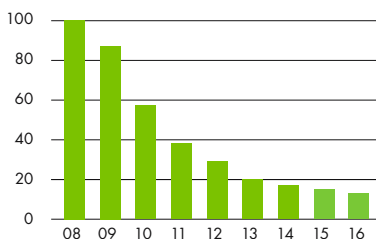
Carbon monoxide, CO

Average concentration boiler 8, 9 and 10 mg/Nm³



Nitrogen oxides, NO_x

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



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.

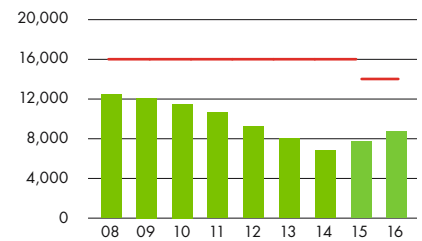
In the on-site treatment plant, the effluents are first cleansed in a chemical-mechanical and then in a biological treatment stage. If necessary, they are then treated with ozone to break not readily degradable substances (such as the lignin in the wood) into simpler forms which can subsequently be removed by biofiltration.

Since April of 2015, the pre-treated effluents from Aviretta have also been purified in the effluent treatment plant, causing an increase in effluent volume and COD load.

The following graphs with effluent volumes and effluent load refer to the total effluent volume from the treatment plant.

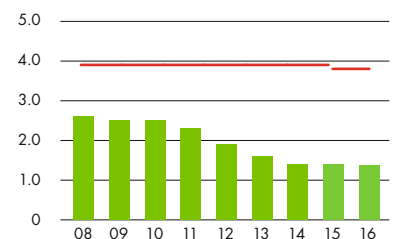
Effluent volume

m³/day



Chemical oxygen demand, COD

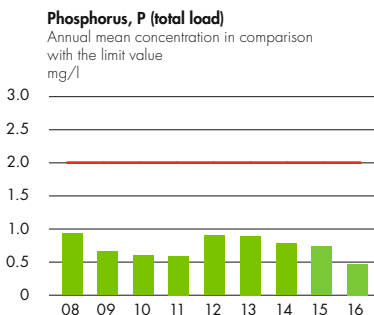
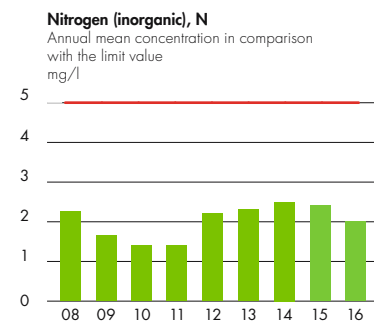
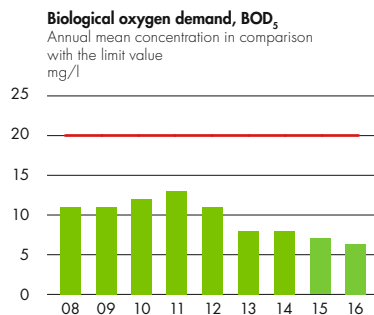
t/day



— Limit value ■ Annual average

The mean BOD₅, nitrogen and phosphorus loads decreased in comparison with the previous year.

A new operating permit for effluent treatment plants came into force on 1 July 2016. In this permit, some limit values were adjusted to the now lower effluent volume.

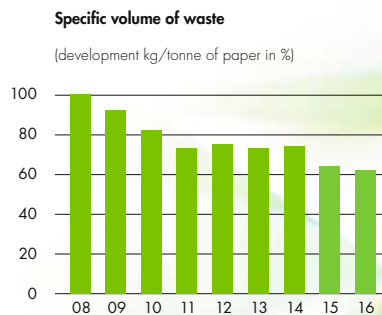


Waste

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 2016, 99.9% of all production waste was recovered.

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



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.



Environmental parameters 2016

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	51,090 t 20.3 t 0.3 t 0.7 t 1.2 t
Water intake	Process-, cooling- and drinking-water	2,728,797 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	2,137,183 m ³ 374 t 15 t 1.0 t 4.3 t 0.18 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	90,722 t 80,028 t 5,639 t 4,382 t 386 t 287 t 105 t 99.9%
Size of mill area	Built on or sealed	33 ha



Internal and external laboratory analyses as well as lots of online measurements help control and minimise our environmental impacts.

* incl. moisture

Performance against targets in 2016

Target	Target achieved?
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.
Energy Reduce specific steam and power consumption by 2.5% in comparison with the previous year	Yes, target was achieved.
Airborne emissions Offer bicycle leasing scheme for employees	Yes, 40 leasing contracts were signed.
Efficiency Increase overall efficiency of the paper machine (target to be defined internally within the framework of the target setting process)	Yes, efficiency of paper machine was increased.

Current targets

Targets and measures	Deadline	Department responsible
Water Maintain voluntarily reduced (by 20%) COD concentration discharged from the treatment plant (control value) to the Wertach river	31.12.2017	Manager Effluent Treatment Plant
Energy Reduce specific steam and power consumption by 2.5% in comparison with the previous year	31.12.2017	Manager Power Plant
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	31.12.2017	Manager Deinking plant
Airborne emissions Reduce average concentration of Nitrogen oxides from gas boilers by 2% in comparison to 2016	31.12.2017	Manager Power Plant
Efficiency Increase overall efficiency of the paper machine (target to be defined internally within the framework of the target setting process)	31.12.2017	Manager Production

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 Environmental Statement 2016 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 Environmental Statement 2016 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 Environmental Statement 2016.

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, 13.04.2017

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

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