

AIMING HIGHER WITH BIOFORE

Updated UPM Corporate
Environmental Statement 2016

UPM pulp and paper mills

About this report

EMAS reporting at UPM pulp and paper mills

All of UPM's European pulp and paper mills as well as the Fray Bentos pulp mill in Uruguay and the Changshu paper mill in China are registered with the EU Eco-Management and Audit Scheme (EMAS), a voluntary environmental management system for companies and other organisations to improve, evaluate and report on their environmental performance on an annual basis.

UPM Corporate Environmental Statement together with the Environmental Performance reports of each mill of UPM comprise the global EMAS statement of UPM Corporate.

Information within the corporate part concerning the sites mentioned here as well as the information used for calculation of UPM Corporate level EMAS core indicators has been assessed and verified by the respective national EMAS auditor.

The present corporate part is the update of the UPM Corporate Environmental Statement 2015. The UPM Corporate Environmental Statement 2015 as well as the present Updated UPM Corporate Environmental Statement 2016 with mill supplements are available at www.upm.com. The next updated EMAS statement will be published in 2018.

Corporate responsibility reporting at UPM

At UPM, the environmental and corporate responsibility reporting is integrated with the company's annual reporting. The UPM Annual Report 2016 follows the framework and indicators of the Global Reporting Initiative's (GRI) reporting guidelines G4 and meets the requirements of the core option. For the Annual Report and GRI content index table, please order a printed copy of the report or visit www.upm.com/responsibility.

Scope of the report

This statement forms the corporate part of the environmental statement, which has been verified in accordance with the EU's Eco-Management and Audit Scheme (EMAS). The following sites are included in the EMAS scope:

- UPM Augsburg
- UPM Caledonian
- UPM Changshu
- UPM Chapelle Darblay
- UPM Ettringen
- UPM Fray Bentos
- UPM Hürth
- UPM Jämsä River Mills
- UPM Kaukas
- UPM Kymi
- UPM Nordland
- UPM Pietarsaari
- UPM Plattling
- UPM Rauma
- UPM Schongau
- UPM Shotton
- UPM Steyremühl
- UPM Tervasaari

Corporate registration number: FI-000058

Information about sites without EMAS registration

The non-European sites UPM Blandin is not EMAS registered. The information concerning this site has not been assessed or verified.

UPM

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

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All process water is treated in mechanical and biological effluent treatment plants before being released into watercourses.



Environmental targets show direction

UPM is committed to sustainable development. Responsibility and a holistic approach to environmental issues are key building blocks of UPM's safe and responsible business operations and product development.

Based on a materiality assessment, UPM has established a series of responsibility principles and determined targets and performance indicators to monitor how these principles

are translated into action.

In terms of environmental responsibility, the key focus areas are sustainable products, the climate, the use of forests and water, and the reduction of waste.

UPM's environmental key areas and principles and current Group-level performance in relation to the relevant targets can be seen in the table below.



The annual target-setting of UPM's pulp and paper mills is published in the mill supplements. The mill-level targets reflect UPM's long-term targets at a local level. In addition, the mill-level targets focus on the specific local development areas.

Group-level environmental targets

| Key area of responsibility | 2030 target ¹⁾ | 2016 results |
|---|--|--|
| Product stewardship Taking care of the entire lifecycle | <ul style="list-style-type: none"> Environmental Management Systems in 100% use (<i>continuous</i>) Environmental Product Declarations for all products (<i>continuous</i>)²⁾ All applicable products eco-labelled by 2030 | <ul style="list-style-type: none"> 96% of production sites have a certified environmental management system in place, remaining have implementation underway. Environmental declarations are available for all relevant UPM products. The share of ecolabelled products was 69% (70% in 2015). Scope widened in 2016. |
| Waste Promoting material efficiency and circular economy – reduce, reuse and recycle | <ul style="list-style-type: none"> No process waste to landfills or to incineration without energy recovery by 2030 | <ul style="list-style-type: none"> 89% of UPM's total process waste was recycled or recovered. |
| Climate Creating climate solutions and working towards carbon neutrality | <ul style="list-style-type: none"> Fossil CO₂ emissions from own combustion and purchased electricity (Scope 1 and 2) reduced 30% by 2030 Maximise the business benefits of greenhouse gas claims (<i>continuous</i>) Improve energy efficiency annually by 1% (<i>continuous</i>) 70% share of renewable fuels (<i>continuous</i>) Acidifying flue gases (NO_x/SO₂) reduced 20% by 2030³⁾ | <ul style="list-style-type: none"> Despite improvements in fuel mix and energy efficiency, actions have not compensated for the increased level caused by the Myllykoski acquisition in 2011 and increased CO₂ factors for purchased power. UPM sold greenhouse gas claims worth of 480,000 CO₂ tonnes. Without sales UPM's reported emissions (Scope 1 and 2) would have been over 7% lower. Energy efficiency target was not achieved. Level of 69% (67%) reached in the use of renewable fuels. 24% reduction achieved since 2008 for the UPM average product. |
| Water Using water responsibly | <ul style="list-style-type: none"> Effluent load (COD) reduced 40% by 2030³⁾ Wastewater volume reduced 30% by 2030³⁾ 100% of nutrients used at effluent treatment from recycled resources by 2030 | <ul style="list-style-type: none"> 27% reduction in effluent load achieved since 2008 for the UPM average product. 13% reduction in wastewater volume achieved since 2008 for the UPM average product. Project was started in 2016, one site almost reached the level already. |
| Forests and biodiversity Ensuring sustainable land use and keeping forests full of life | <ul style="list-style-type: none"> 100% coverage of chains of custody (<i>continuous</i>) All fibre certified by 2030 | <ul style="list-style-type: none"> Coverage is 100%. The certified fibre share remained at 84%. |

1) Environmental targets: from 2008 levels

2) Includes paper, timber, plywood, pulp and label

3) Numerical targets relevant for pulp and paper production

Pulp

By the end of 2016 UPM Pulp had increased its pulp production capacity by more than half a million tonnes in just four years. Simultaneously, production efficiency has improved at all mills thanks to these growth investments. UPM has also focused on strengthening employee competencies and mill maintenance as well as environmental performance. The investments included improvements in waste water treatment, bleaching processes and energy efficiency.

UPM's Tonnes of Trust programme is aiming to have the right pulp dispatched to the right end-user without compromising environmental protection, occupational health and safety and production efficiency. This means smooth running operations at the pulp mill without any unscheduled stops – which would put strain on the environment.

Fibre sources

In 2016, 84% of wood was sourced from PEFC™ and/or FSC® certified forests with the remainder coming from controlled sources.

Energy

UPM's pulps mills are more than self-sufficient in energy usage, providing surplus heat and

electricity for the integrated paper mill or to external parties. The share of renewable energy decreased slightly from 93% to 92% in 2016, but is still on a very good level. Fossil fuels are needed mainly for start-up of the boilers.

Air

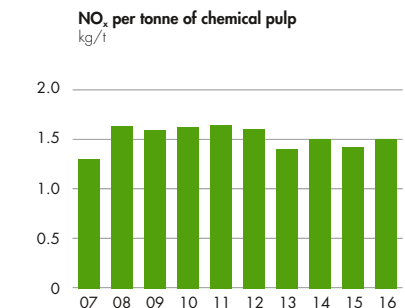
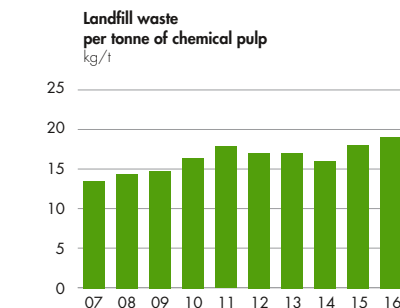
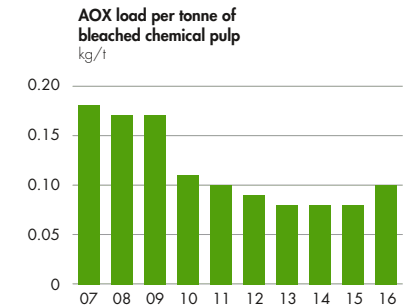
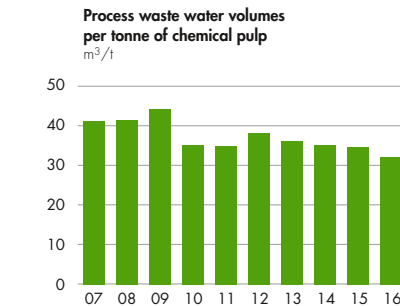
Over the last years, air emissions stayed on a quite stable level. In 2016, slight improvements were achieved for the specific emission of fossil carbon dioxide, sulphur dioxide and total reduced sulphur, while nitrogen oxide emissions slightly increased.

Water

The waste water volume per tonne of paper decreased by 22% over the last ten years, but remained on a rather stable level in recent years. Parameters for the effluent load, like COD and AOX, also decreased significantly over the last ten years by 40% and 43%, respectively. However, in 2016 the AOX per tonne of pulp increased due to the production increase. Optimisation work is currently ongoing at all mills.

Waste

The total waste per tonne of chemical pulp



was on a stable level compared to last year. However, the waste recycling rate decreased slightly to 60% in 2016 (63% in 2015). One reason was the increased disposal of excessive sludge at UPM Fray Bentos. This will be solved by investment in a dryer, in order to use the dried sludge as soil improver. Green

liquor dregs are the most relevant waste fraction for landfill waste. Reuse options are difficult to find, but research is continuing in this area. E.g. at Pietarsaari part of this waste fraction could be utilised as chalk for the

Read more at www.upmpulp.com

Paper

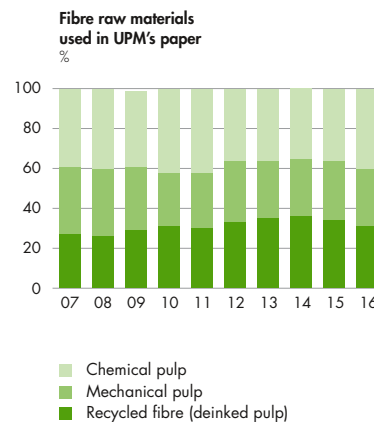
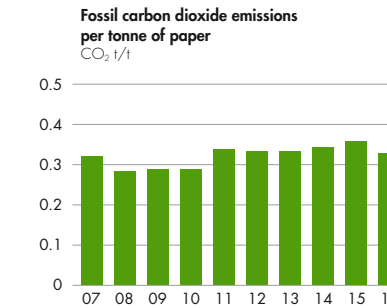
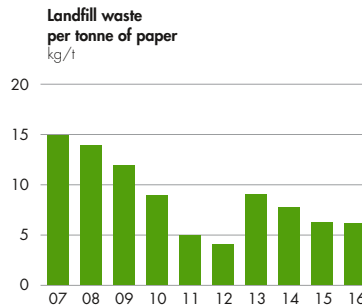
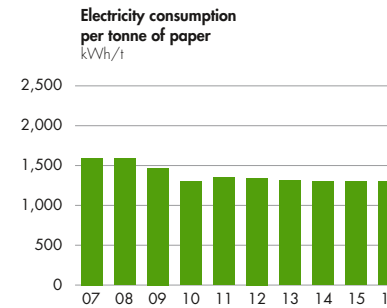
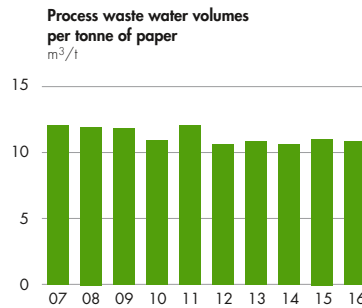
A new specialty paper machine started regular commercial production in 2016 at UPM Changshu in China. Production of graphic paper decreased during 2016 due to closure of UPM Madison in the US and the sales of UPM Schwedt in Germany. Overall, the paper production decreased by about 400,000 tonnes compared to 2015. In November 2016, UPM announced plans to permanently close one paper machine at UPM Steyrermühl in Austria and one at UPM Augsburg in Germany.

Fibre

In 2016, 31% of all fibre used in UPM's paper production was recycled fibre. 84% of the virgin wood fibre was sourced from PEFC and/or FSC certified forests, the remainder came from controlled sources.

Water

During the last ten years, the COD load (chemical oxygen demand) per tonne of paper has decreased by 23%, and process waste water volume per tonne of paper by 11%. As the waste water volume and COD load are already on a rather low level, further improvements of the volumes per tonne of product are getting more and more challeng-



Supplier assessments and requirements

UPM requires its suppliers and third party intermediaries such as agents, consultants, advisers and joint venture partners to apply the principles of UPM's Code of Conduct and to fulfill the criteria concerning social and environmental responsibility. These requirements are defined in the UPM Supplier and Third Party Code, and suppliers are qualified against these requirements. UPM Code of Conduct was revised in 2016 and in connection with that UPM also revised its Supplier Code.

UPM's supplier risk assessment covers financial, quality, environmental, social, economic and delivery related risks. The human rights-related risk assessment of suppliers has been enhanced since 2003. Based on the risk assessments, UPM selects the suppliers whose performance is assessed in more detail. UPM uses tools such as annual questionnaires, joint development plans and also supplier audits which are initiated based on identified risks or gaps in supplier performance.

ing. Compared to 2015 the water-related parameters stayed on a comparable level in 2016.

Air

In 2016, emissions of NOX per tonne of paper slightly increased compared to 2015 and specific SO₂ emissions slightly decreased. A remarkable reduction in SO₂ was achieved in 2015, mainly due to a EUR 12 million investment in a new combustion gas purification system at UPM Changshu's combined heat and power plant in 2014.

In 2016, emissions of fossil CO₂ per tonne of paper decreased compared to 2015, mainly because of change in energy supply at UPM Hürth. Since 1990, the fossil CO₂ per tonne of paper decreased by approximately 25%. The acquisition of paper mills with a high percentage of fossil fuel usage significantly increased emissions in 2001 and 2011. Big improvement steps were made through investments in biofuel-based energy generation. Continuous improvement of energy efficiency also reduces fossil CO₂ and other air emissions. A new combined heat and power (CHP) plant at the UPM Schongau mill in Germany started up at the end of 2014. It increased the self-generation of electricity from currently 45% to 70%, thus increasing the mill's direct CO₂ emissions and at the same time

decreasing the emissions related to purchased electricity.

Energy

The electricity consumption per tonne of paper remained rather stable compared to 2015, but has decreased by 14% during the last ten years due to continuous improvement of energy efficiency.

Waste

The amount of landfilled waste per tonne of paper was reduced by 6% in 2016. During the last ten years the amount of landfilled waste per tonne of paper has decreased by even 50%. Ash results from energy generation and is the biggest waste fraction for UPM's paper mills. However, from 2012 to 2013 the amount of landfilled waste increased significantly. The reason was that former recycling possibilities for ash ceased at UPM Shotton. Starting from 2014, new methods of recycling were established, with further options still being investigated. Overall for UPM's paper mills in 2016, over 90% of waste was recycled or recovered.

Read more at
www.upmpaper.com

Clean Run

Clean Run aims to improve the environmental impact of all UPM operations. The goal is to significantly improve the current level of environmental performance and awareness, including better risk management.

The campaign has been visible in the pulp and paper mills since 2011, and has become a proactive way of managing environmental operations at mills. Systematic reporting and follow-up of environmental deviations, including reporting of environmental observations, are in active use at all pulp and paper mills. Company-wide guidelines for producing reports according to five defined categories have been implemented. The five categories range from 1 (minor) to 5 (severe). Together with improved information sharing, Clean Run audits have helped to identify development issues and related best practices. With all of the actions taken, the "Clean Run Way of Thinking" is today part of daily routines.

In 2016, no serious environmental incidents occurred at UPM's pulp and paper mills. However, several minor temporary deviations from permit limits did arise. Those were immediately reported to authorities and corrective measures were taken to prevent similar situations from occurring again.

Best Available Techniques

Industry-specific reference documents are developed by the European IPPC Bureau. The document for the pulp and paper industry has been updated, and the conclusions were published by the EU Commission in September 2014. The BAT conclusions are now the reference for setting permit conditions for installations covered by the EU's Industrial Emissions Directive. The implementation period is four years. UPM is benchmarking its production lines against the BAT values.

Environmental parameters 2016

Core indicators

UPM paper mills

| Production | Scope: all UPM paper mills 9,300,000 t | | Scope: EMAS-registered mills 8,960,000 t | |
|--------------------------------------|---|---------------------------------|---|---------------------------------|
| | Total amount per year | Indicator per tonne of paper | Total amount per year | Indicator per tonne of paper |
| Energy efficiency | | | | |
| Electricity consumption | 11,800 GWh | 1,300 kWh/t | 11,100 GWh | 1,200 kWh/t |
| Steam consumption | 11,000 GWh | 1,200 kWh/t | 10,200 GWh | 1,100 kWh/t |
| Own energy generation | 37% renewable share | | 35% renewable share | |
| Purchased energy | 21% renewable share | | 21% renewable share | |
| Material efficiency | | | | |
| Chemical pulp | 2,590,000 t | 280 kg/t | 2,520,000 t | 280 kg/t |
| Mechanical pulp | 1,730,000 t | 190 kg/t | 1,730,000 t | 190 kg/t |
| Recycled fibre pulp | 1,920,000 t | 210 kg/t | 1,920,000 t | 210 kg/t |
| Minerals | 2,380,000 t | 260 kg/t | 2,280,000 t | 250 kg/t |
| Binder | 272,000 t | 29 kg/t | 259,000 t | 29 kg/t |
| Water | | | | |
| Water intake | 220,000,000 m ³ | 23 m ³ /t | 192,000,000 m ³ | 21 m ³ /t |
| Process waste water | 100,000,000 m ³ | 11 m ³ /t | 93,100,000 m ³ | 10 m ³ /t |
| COD | 31,000 t | 3 kg/t | 29,800 t | 3 kg/t |
| TSS | 3,300 t | 0.4 kg/t | 3,300 t | 0.4 kg/t |
| Waste¹⁾ | | | | |
| Waste, total | 789,000 t | 84 kg/t | 757,000 t | 85 kg/t |
| of which: | | | | |
| ash ²⁾ | 422,000 t | 45 kg/t | 413,000 t | 46 kg/t |
| sludges | 210,000 t | 23 kg/t | 195,000 t | 22 kg/t |
| wood residues | 77,300 t | 8 kg/t | 77,200 t | 9 kg/t |
| deinking residues ³⁾ | 18,900 t | 2 kg/t | 18,900 t | 2 kg/t |
| others | 53,500 t | 6 kg/t | 52,200 t | 6 kg/t |
| Recycling rate | 93% | | 94% | |
| Hazardous waste | 1,800 t | 0.2 kg/t | 1,700 t | 0.2 kg/t |
| Emissions | | | | |
| CO ₂ fossil | 2,900,000 t | 310 kg/t | 2,790,000 t | 310 kg/t |
| NO _x , as NO ₂ | 4,000 t | 0.4 kg/t | 3,600 t | 0.4 kg/t |
| SO ₂ | 850 t | 0.1 kg/t | 790 t | 0.1 kg/t |
| Particulates | 100 t | 0.01 kg/t | 91 t | 0.01 kg/t |

Core indicators

UPM chemical pulp mills

| Production | Scope: all UPM pulp mills 3,470,000 t | |
|--------------------------------------|--|---|
| | Total amount per year | Indicator per tonne of chemical pulp |
| Energy efficiency | | |
| Electricity consumption | 2,100 GWh | 600 kWh/t |
| Steam consumption | 16,000 GWh | 4,600 kWh/t |
| Own energy generation | 92% renewable share | |
| Purchased energy | all energy is generated internally ⁵⁾ | |
| Material efficiency | | |
| Wood | 15,400,000 m ³ | 4 m ³ /t |
| Process chemicals ⁴⁾ | 408,000 t | 120 kg/t |
| Water | | |
| Water intake | 203,000,000 m ³ | 59 m ³ /t |
| Process waste water | 110,000,000 m ³ | 32 m ³ /t |
| COD | 38,400 t | 11 kg/t |
| TSS | 1,200 t | 0.4 kg/t |
| AOX | 340 t | 0.1 kg/t |
| Waste¹⁾ | | |
| Waste, total | 172,000 t | 50 kg/t |
| of which: | | |
| sludges | 30,300 t | 9 kg/t |
| green liquor dregs | 45,700 t | 13 kg/t |
| wood residues | 76,600 t | 22 kg/t |
| lime | 3,100 t | 1 kg/t |
| construction waste and soil | 6,800 t | 2 kg/t |
| others | 16,500 t | 5 kg/t |
| Recycling rate | 60% | |
| Hazardous waste | 460 t | 0.1 kg/t |
| Emissions | | |
| CO ₂ fossil | 279,000 t | 80 kg/t |
| NO _x , as NO ₂ | 5,100 t | 1 kg/t |
| SO ₂ | 320 t | 0.1 kg/t |
| Particulates | 610 t | 0.2 kg/t |
| TRS | 76 t | 0.02 kg/t |

- 1) Reported in dry tonnes
- 2) Including ash, which is considered as hazardous waste in the UK
- 3) Non-fibrous residues, e.g. CDs, plastic
- 4) Main chemicals used: oxygen gas, sodium hydroxide, sodium chlorite or chlorate, sulphuric acid, limestone, hydrogen peroxide
- 5) In 2016 there was an exceptional two months electricity purchase at UPM Kaukas, because of repairing of recovery boiler turbine.

For the core indicators of 2015, please see last year's environmental statement.

For indicator for biodiversity, please see the mill supplements where information about the mill area is included.

All mill supplements are available at www.upm.com/responsibility.

Glossary

Activated sludge process

A three-stage biological effluent treatment method.

AOX, Adsorbable organic halogen compounds

AOX represents the total amount of chlorine bound to organic compounds in waste water. Such compounds occur naturally, but are also formed in conjunction with the bleaching of chemical pulp. AOX should be limited to a level where it has minimum environmental impacts.

BAT, Best available techniques

The best available technology that allows for solutions that are technically, economically and environmentally the most efficient and advanced.

BOD, Biological oxygen demand

COD, Chemical oxygen demand

The effluent, or waste water of pulp and paper mills includes organic substances which consume oxygen during biodegradation. Low oxygen content in fresh and sea water can have an adverse effect on plant and animal life. BOD refers to the amount of oxygen consumed in the biological decomposition of organic compounds. COD refers to the amount of oxygen consumed in the complete chemical oxidation of organic compounds.

CO₂, Carbon dioxide

Combustion product of carbon. Fossil carbon dioxide emissions arise from fossil fuels like coal, oil and petrol.

CHP, Combined heat and power technology

Combined heat and power (CHP) production (or cogeneration) is when both electricity and heat are produced at a thermal power plant. The heat is used, for example, in industry or district heating, or as process steam.

Chain of Custody (COC)

An unbroken trail of documentation to guarantee the identity and integrity of the data used as, for example, in demonstrating the origin of wood.

Chemical pulp

Generic name for wood-based fibres separated from each other by “cooking” wood chips or plants in hot alkaline or acidic solutions of various chemicals.

Deinking

The process whereby the ink and impurities are removed from recovered paper. Deinked pulp: see recycled fibre pulp.

EMAS, Eco-Management and Audit Scheme

Voluntary environmental management system for companies and other organisations to improve, evaluate and report on their environmental performance on an annual basis. The environmental review is approved by a third-party accredited EMAS verifier.

Forest certification

An independent review process that determines whether a forest is managed in a responsible manner. There are two global forest certification schemes: FSC® (Forest Stewardship Council®) and PEFC™ (Programme for the Endorsement of Forest Certification).

Graphic recovered paper

Mainly white paper collected from households, e.g. newspapers, magazines, catalogues and copy paper.

ISO 9001

Quality management system standard published by the International Organisation for Standardisation (ISO). This is a voluntary, international and third-party certified system.

ISO 14001

Environmental management system standard published by the International Organisation for Standardisation (ISO). This is a voluntary, international and third-party certified system.

ISO 50001

Energy management system standard published by the International Organisation for Standardisation (ISO). This is a voluntary, international and third-party certified system.

Mechanical pulp

Generic name for wood-based fibres separated from each other mechanically.

N, Nitrogen

P, Phosphorus

N and P are chemical elements essential for plant and animal life. Both substances occur naturally in wood and are often added as a nutrient in biological treatment plants. Excessive levels released into watercourses can cause nutrient enrichment, i.e., eutrophication, which accelerates the growth of algae and other vegetation.

NO_x, Nitrogen oxides

These gases are produced during combustion. In moist air, nitrogen oxides can form nitric acid which, in turn, is precipitated as “acid rain”. This nitrogen-containing rain also has a fertilising effect, i.e. eutrophication.

OHSAS 18001

Specifications for an Occupational Health and Safety Management System.

Recycled fibre pulp

Fibres and fillers retrieved from recovered paper. If the recovered paper is deinked, the processed pulp is also called deinked pulp.

SO₂, Sulphur dioxide

This gas is generated by burning sulphur-containing fuels. On contact with moist air, SO₂ forms sulphuric acid, which contributes to “acid rain” and acidification.

Sustainable forest management

In the long term, a sustainably managed forest means that it is not harvested more than it grows. Sustainably managed forests maintain their biodiversity, productivity, regeneration capacity, vitality and their potential to fulfil (now and in the future), relevant ecological, economic and social functions, at local, national and global levels without damaging other ecosystems.

TRS, Total reduced sulphur

Reduced sulphur compounds that usually cause odour problems and that are released, for example, during chemical pulp production.

TSS

TSS are solid materials, including organic and inorganic, that are suspended in the water.



Validation statement

As accredited or licensed environmental verifiers,

- BSI (UK-V-0002) for Caledonian
 - DNV GL Business Assurance Finland Oy Ab (FI-V-0002) for Rauma
 - ECOCERT (FR-V-0010) for Chapelle Darblay
 - Inspecta Sertifiointi Oy (FI-V-0001) for Changshu, Fray Bentos, Jämsä River Mills, Kaukas, Kymi, Pietarsaari and Tervasaari
 - NQA (UK-V-0012) for Shotton
 - Quality Austria (A-V-0004) for Steyrmühl
 - TÜV NORD CERT Umweltgutachter GmbH (DE-V-0263) for Augsburg, Ettlingen, Hürth, Nordland, Plattling and Schongau
- have examined the environmental management systems of each mill mentioned above, the information contained in the updated Environmental Performance Reports, the information in the corporate part, as far as it concerns the respective mills, as well as the information used for the calculation of UPM Corporate level EMAS core indicators.

Following these examinations and the examination of the Updated UPM Corporate Environmental Statement 2016 on 01/06/2017 Inspecta Sertifiointi Oy as the coordinating environmental verifier of this common EMAS validation herewith confirms that the environmental management systems and the Updated UPM Corporate Environmental Statement 2016 together with the updated Environmental Performance 2016 reports comply with the requirements of the EU's EMAS regulation (EC) No. 1221/2009.



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