

ENVIRONMENTAL performance in 2014



UPM Shotton



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 Paper Asia, UPM Paper Europe and North America and UPM Plywood. Our products are made of renewable raw materials and are recyclable. We serve our customers worldwide. The group employs around 20,000 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 Shotton

The mill is situated on the Dee estuary in Flintshire, North Wales. The Dee Estuary is a designated Special Protection Area one of the 112 listed Natura 2000 sites in Wales. The mill site is about 10 miles from Chester and 25 miles from Liverpool.

The mill began production with one newsprint line in 1985. The fibre was supplied by an energy intensive thermo-mechanical pulp mill which used pulpwood, straight from the forest, as its principal raw material.

A second newsprint line was added in 1989 together with the first of three recycled fibre production plants.

Today the two newsprint lines use 100% recycled fibre. The principal raw material is now sorted, recovered graphic papers, mainly from domestic waste collections.

There have been several other large environmental investments over the last 28 years and the Accreditations operations on site continue to develop.

The effluent treatment plant was rebuilt with activated sludge technology to deliver dramatic improvements in waste water quality despite increases in production

Waste sludge from the recycled fibre production plants is burnt in a combined heat and power (CHP) plant on site along with other renewable fuels to provide most of the site's thermal energy and approximately a third of its electricity demand

A Material Recovery and Recycling Facility (MRRF) was constructed and started operation on the site in April 2011. This plant sorts the recyclable material from co-mingled domestic waste collections and delivers high quality recovered paper raw materials to the recycled fibre production plants.

Production capacity	Up to 520,000 tonnes per annum
Personnel	335
Products	Standard Newsprint
Certificates	EMAS – EU Eco-Management and Audit Scheme ISO 14001 – Environmental Management System Standard ISO 9001 – Quality Management 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
Awards	Investors in People Standard



UPM Shotton Environmental Performance in 2014 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 2014. 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 2016.



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FI/37/001

Environmental year 2014

At UPM Shotton our commitment to sustainable development is reflected in our Mill Vision 'to be the front runner in creating value from renewable and recyclable materials'.

The mill also demonstrates continuous improvement through the mill management targets and continued innovative investments on site. This approach can be seen in 2014 with the on-going optimisation of the state-of-the-art MRRF plant on site and the construction of a waste fuel preparation plant for the site CHP plant.

The site operates under an environmental permit (EP) issued by the environmental regulator, Natural Resources Wales (NRW). The mill remains part of the UK pulp and paper sector where permit conditions will be varied to reflect recent changes in the sector regulations and technical guidance.

The environmental performance of the CHP plant has continued to improve. The continued use of the 'intelligent' combustion control system has resulted in no carbon monoxide emission spikes that exceeded our permit short-term limits in 2014.

UPM have continued their investment programme in the CHP plant improvements at Shotton. The planned shutdown in March 2014 included work designed to reduce mechanical erosion damage and so prevent disturbances and unplanned shuts.

The mill operating rate during 2014 has been lower than 2013 which has meant that specific environmental targets have been very difficult to achieve. The mill

operating rate is affected by outside factors, such as the UK and global newsprint markets, so is very difficult to forecast for 2015. Accordingly, the mill environmental targets for 2015 have been based on total consumptions rather than specific performance targets.

The specific electrical energy and water consumption targets for 2014 were not achieved and the target for 2015 will be to reduce the total electrical energy and water consumption compared to 2014.

Another important part of our environmental performance is to maximise the electrical energy supplied from the CHP plant on site. Unfortunately, there were several CHP plant unplanned shuts in 2014 and the improvement target for increased turbine availability was not achieved. In 2015 the target is to increase the pro-

portion of 'Green' electrical energy produced by the CHP turbine.

The effluent treatment plant performance was good but there was a short period in May when the biological oxygen demand (BOD) in the final effluent exceeded the permit consent limits. The investigation noted that the chemical oxygen demand (COD) had been rising for a period, probably due to a leaking seal in the recycling plant. The action alarm limits on the effluent plant COD levels have been reduced in order to prevent a similar problem developing in the future.

Finally, the diversion of waste from landfill remains a focus for the site and the MRRF throughput was increased again in 2014. The improvement target in 2015 is to further reduce the proportion of all site wastes that are sent to landfill.



A blue ink signature of Andrew Bronnert.

Andrew Bronnert,
Head of Energy & Operational Support



A blue ink signature of David D Ingham.

David D Ingham,
General Manager

Air

The CHP plant has the largest impact on the air emissions. Smaller back-up boilers on site only run during the winter months or during unplanned CHP plant shuts.

The 2014 fossil CO₂ emissions were lower than 2013 due to the policy of stopping the papermachines during most of the CHP plant shuts.

The number and length of unplanned CHP shuts increased in 2014 due to continued boiler tube failures and internal fouling.

The majority of emissions were well within permit limits as indicated in the tables below.

The 'intelligent' combustion control system has predicted changes in combustion conditions and reacted quickly in order to prevent peaks and troughs in the CHP emissions. There were no emission spikes that exceeded the short-term (30 minute) permit limits in 2014.

EMISSIONS FROM THE COMBINED HEAT AND POWER PLANT IN 2014

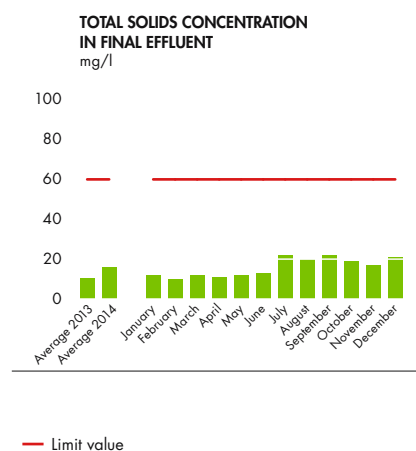
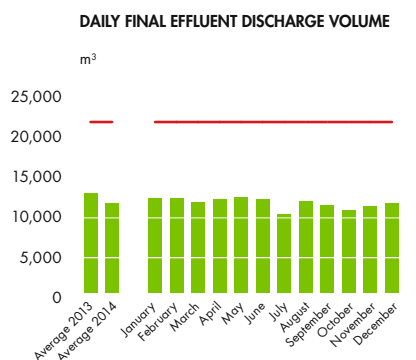
Continuous measurements	Limit mg/m ³	Mean mg/m ³
Carbon monoxide (CO)	50	24.6
Nitrous oxides (NO _x)	200	146.18
Sulphur dioxide (SO ₂)	50	4.9
Particulates	10	0.27
Total organic carbon (TOC)	10	1.22
Hydrogen chloride (HCl)	10	1.34

Periodic measurements (twice per annum)	Limit mg/m ³	Mean mg/m ³
Mercury	0.05	0.00175
Cadmium & thallium	0.05	0.00359
Tin, arsenic, lead, chromium, cobalt, copper, manganese, nickel, vanadium	0.5	0.240
HF	2	0.22
Dioxins/furans (ITEQ)	0.1 x 10 ⁻⁶	0.00335 x 10 ⁻⁶

Water

Fresh water consumption is constantly monitored and measured in all parts of the site. Process water is often re-used several times before being discharged to the effluent treatment plant. The target in 2014 was to further reduce the specific water consumption but the reduced operating rate due to papermachine shuts made this target virtually impossible to achieve.

The final effluent discharge remained well within consent limits throughout the majority of the year, as shown in the trends below. The operation of the effluent treat-



Waste

ment plant was stable and the only problem encountered with final effluent quality came from changes in the quality of effluent sent to the treatment plant. Some BOD results recorded for 7-9th May were higher than the consented limit. Investigations indicated that the COD of effluent sent to the treatment plant had been higher than normal for a period beforehand. During that period the seal on the drum pulper in the recycled fibre plant (RCF) was known to be faulty and caustic pulper liquor was mixing with the normal RCF effluent flow. Changes have

been made to the effluent treatment plant operating regime so that alarms will be raised sooner in order to highlight quality changes in the effluent sent for treatment. The regime for inspecting and changing the RCF drum pulper seals has also been revised.

The seasonal effluent temperature limit of 28 degrees C was applied on several occasions during periods of high ambient air temperature.

Following the re-classification of CHP plant ash as a hazardous waste the majority of this material has been taken to a landfill site in Yorkshire. Re-use outlets for the ash in cement production and land remediation projects have started to increase the recovery rate for ash produced on site.

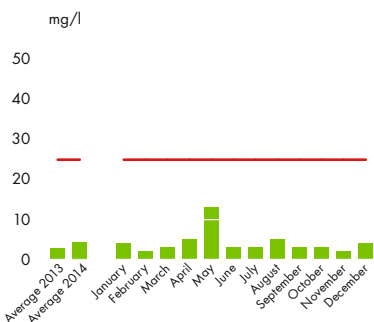
The overall production of ash has also been limited by the increased re-use of RCF sludge as an improved animal bedding material in dairy farms.

The amount of non-repulpable rejects from the RCF process was higher than during 2013, despite a lower recycled pulp production rate during 2014. A clear indication of the overall decline in quality of recovered paper raw material supplies to the site. The local RCF rejects processing plant was closed during 2014 as the economics of the operation were not sustainable.

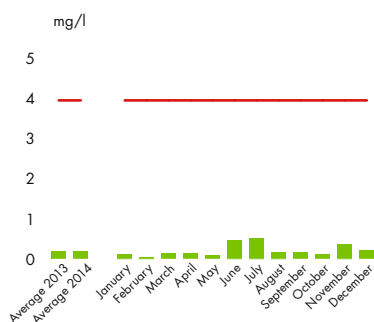
The MRRF plant on site increased total throughput again in 2014 which increased the overall diversion of municipal waste from landfill. The MRRF residual waste was diverted from landfill and sent for further reprocessing throughout the year.

The amount of hazardous waste from the disposal of mixed chemicals, oily materials and waste oils remained stable in 2014.

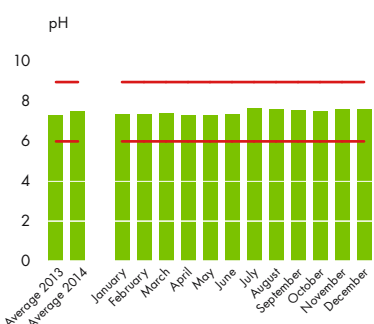
BIOLOGICAL OXYGEN DEMAND, BOD₅



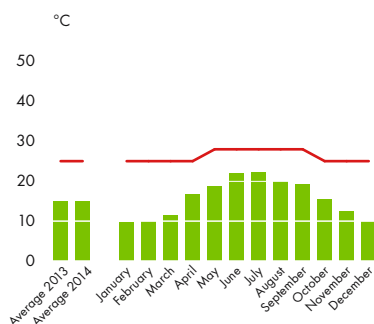
NITROGEN, N



EFFLUENT pH



TEMPERATURE



Environmental parameters 2014

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.

Production capacity	Paper	Up to 520,000 t
Raw materials and additives	Recovered paper Co-mingled recyclates Process chemicals Operating supplies	See UPM Corporate Environmental Statement for more information
Energy	Biomass fuels Fossil fuels Electricity	86% 14% See UPM Corporate Environmental Statement for more information
Emissions to air	Sulphur dioxide, SO _x Nitrogen oxides, NO _x Carbon dioxide, CO ₂ (fossil)* Particulates	9.3 t 268.9 t 21,752 t 1.25 t
Water intake	Industrial**	5,318,380 m ³
Discharges to water	Chemical oxygen demand, COD Biological oxygen demand, BOD ₅ Total suspended solids, TSS Effluent volume	491 t 17.9 t 66.3 t 4,204,964 m ³
Waste***	Landfill Sludge Fly ash Bottom ash Metal Recovery rate Hazardous waste	65,449 t 38,718 t 58,306 t 5,308 t 416 t 55% 58.7 t
Size of mill area		62 ha



* CO₂ fossil emissions are based on current un-verified EUETS returns for the site.

** Including potable water used on site.

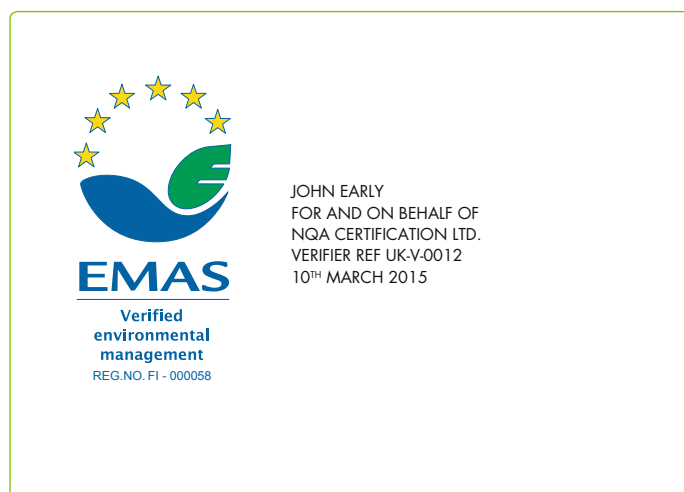
*** All waste tonnages are stated as wet weight and exclude wastes generated from the MRRF plant. Recovery rate is calculated on a bone-dry basis.

Performance against targets in 2014

TARGETS AND MEASURES	DEADLINE	TARGET ACHIEVED?
Energy		
Reduce specific energy consumption – target less than 2013 level	12/2014	Not Achieved
Increase CHP plant availability – target less than 2013 unplanned shut time	12/2014	Not Achieved
Water Conservation		
Reduce specific water consumption – target less than 2013 level	12/2014	Not Achieved
Use of Resources		
Reduce waste to landfill – target to increase the MRRF plant throughput	12/2014	Achieved

Environmental targets 2015

TARGETS AND MEASURES	DEADLINE	DEPARTMENT(S) RESPONSIBLE
Energy		
Reduce total electrical energy consumption – target less than 2014 level	12/2015	Production and Utilities
Increase % 'Green' electrical energy consumption – target more than 2014 level	12/2015	Utilities
Water Conservation		
Reduce total water consumption – target less than 2014 level	12/2015	Production and Utilities
Use of Resources		
Reduce waste to landfill – target to decrease % waste to landfill	12/2015	Production and Utilities
Reduce Chemical consumption – target decrease in total chemical consumption	12/2015	Production and Utilities



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