

UPM Caledonian  
**Environmental and  
Societal Responsibility**  
2017



# UPM Caledonian

UPM's Caledonian mill is situated in Irvine on the West Coast of Scotland approx. 50 kilometres southwest of Glasgow. In production since April 1989 the Caledonian mill is capable of producing 260,000 tonnes of lightweight coated paper (LWC) for printing magazines, catalogues, brochures. The mill has a Biomass Combined Heat and Power (CHP) plant, a single paper machine line, a debarking plant, a pressurised groundwood (PGW) mechanical pulp mill and a primary effluent treatment plant. Effluent is then treated further in the neighbouring Municipal Waste Water Treatment Plant operated by Scottish Water.

Environmental issues are an integral part of everyday operations. Targets are set as part of our annual planning process with our key environmental aspects and impacts identified through our regulatory and business requirements to demonstrate continuous improvement. These are followed closely through the year. Our objective is to produce attractive and competitive paper with the lowest possible overall environmental impact. Through open communication we actively provide our customers, employees, environmental authorities, as well as our local community with information on environmental issues and knowledge of the mills operations.



<b>Production capacity</b>	up to 260,000 tonnes of paper
<b>Personnel</b>	270
<b>Products</b>	Coated Magazine Papers: UPM Cote H (+NA) UPM Ultra H UPM Ultra Silk H UPM Cote Blueshade H
<b>Certificates</b>	EMAS – EU Eco-Management and Audit Scheme ISO 9001 – Quality Management System ISO 14001 – Environmental 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 <a href="http://www.upm.com/responsibility">www.upm.com/responsibility</a> )
<b>Environmental labels</b>	EU Ecolabel



UPM Caledonian 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](http://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](http://www.upm.com)



The mark of responsible forestry  
For FSC products, visit [www.fsc.org](http://www.fsc.org)



For PEFC products, visit [www.pefc.org](http://www.pefc.org)



EU Ecolabel : FI/011/001

# Review of the year 2017

## Environmental Year

This Report gives information on the Mill's performance and covers the most significant environmental impacts – emissions to Air and Water; Waste and Material consumption.

UPM Caledonian operates within the boundaries of an Integrated Pollution Prevention and Control (PPC) Permit. The conditions of this permit are transposed from the European Industrial Emissions Directive with reference to the current Pulp and Paper BREF document. Our Annual Compliance assessment by the Scottish Environmental Protection Agency (SEPA) was judged to be 'Good' for 2017. This rating compares performance against Environmental Limit Conditions and Environmental Management Conditions which are detailed within the PPC Permit. During 2017 there were 3 instances of emissions to air exceeding the emission limit value dictated within the PPC permit, these related to NO<sub>x</sub> and CO emissions during April where there were several instances of fuel feeding blockages and poor air control within the CHP boiler. Maintenance work carried out during the annual shutdown in May ensured no further instances of fuel blockages had an impact on emissions.

A condition within the PPC permits requires the site to ensure that control systems and interlocks are maintained to prevent waste being fed to the boiler during abnormal operating conditions. A review of the risk assessment of the abatement system and interlocks was undertaken in 2017 to ensure there are no areas that are not controlled to prevent an abnormal breach of emissions to air.

## Energy

This was the first full year of capturing the benefits of the energy recovery system at the off machine coater where the waste heat from the solaronics exhaust gas system is used to preheat the supply air to the air flotation dryers. This has had a positive impact in reducing the total energy and also a significant reduction in CO<sub>2</sub> emissions.

Due to extreme price fluctuations in the electricity market within the UK there is a financial incentive to reducing the electrical load of energy intensive industries at peak times. Due to the

prediction of the peak periods the site has ensured that where practicable energy reduction for key areas of the plant is achieved.

In conjunction with UPM Energy and a third party company Caledonian undertook a project to monitor the performance of the biomass fuels to the CHP boiler. Using X-ray radiation technology in various locations of the fuel feed then fuel quality properties such as: moisture content; foreign matter and energy content can be determined. A Finnish thesis student lead this project for an initial period of 5 months during 2017 which has given some promising results. Further work is ongoing to fine tune the equipment at site.

## Management Systems

By using both the Quality First System and the One Safety platform Caledonian ensures that the requirements of ISO 9001, 14001 and OHSAS 18001 are in compliance and improvements carried out where necessary. The performance of both internal and external audits is satisfactory with one major incident raised regarding the contents of first aid boxes not being maintained. A full review of this area was undertaken with significant improvements being achieved.

During 2018 Caledonian will work towards certification to ISO 45001 which will come into effect in March 2018 replacing the OHSAS 18001 standard.

## Safety

Unfortunately Caledonian had two serious accidents in 2017 resulting in injuries to personnel. Investigations of these incidents were undertaken with corrective and preventive actions taken as required. Some further actions may be implemented during 2018.

Although the number of near misses and accidents increased in 2017 the number of observations which are utilised to prevent incidents increased by 70%.

The site has reenergized the use of STAT cards which is a 'simple' risk assessment to help raise risk awareness of a task. These are designed to make those involved with a task think about the hazards/risks that are present and the control measures that are already in place. Where it is judged that any hazard/risk is not adequately controlled, the aim is then to consider the additional precautions or controls needed to minimise the risk. The STAT card is also useful for recording and communicating safety information with the work team and others affected by the task being carried out.

To ensure there is continued focus on safety related matters the meeting of the site Health and Safety Committee will change from 6 monthly to monthly during the first quarter of 2018. This meeting involves representatives from various areas of the mill including Site Safety representatives, HSE Manager, Prod Manager and Engineering Manager.



Gordon Mitchell  
General Manager



Tom Dunn  
HSE Manager

# Responsibility figures 2017

## Waste



Recovery/Reuse/Recycle

100%

Co-operation with waste contractor ensures zero to landfill

## Water



155,000 tons

The reduction in fresh water intake to the site in comparison to 2016

Water reduction continues to be an area of focus.

## Qualified Spend

98%

of raw materials spend excluding wood qualified against UPM Supplier and Third Party Code

## Air



Carbon dioxide (CO<sub>2</sub>) is a colourless, odourless and non-poisonous gas formed by combustion of carbon and in the respiration of living organisms and is considered a greenhouse gas.

88%

reduction of fossil CO<sub>2</sub> emissions over the last 10 years

Combustion of biomass in the CHP boiler, previous boiler utilised natural gas as primary fuel



## Energy

Natural gas reduction due to energy recovery system installed at coater in 2016 has resulted in a

43%

reduction in natural gas consumption at the coater (2015 vs 2017MWh)

## Safety



# 1309

STAT cards generated during 2017

These 'simple' risk assessments are used by employees to consider the risks involved when carrying out a task. Additional control measures to ensure the safety of individuals may be suggested or the need for a formal risk assessment to be completed.

## Community



Through the Caledonian Employee Charity Fund, local charities have benefitted from

# £156,230

as charitable donations from employees. Ayrshire Hospice received £1500 in 2017.

## Health



# 93

the number of employees who participated in a free health check in 2017.

Health check consists of:

- Weight, Body Mass Index
- Blood Pressure, heart rate
- Diabetes test, Cholesterol
- Cardiac Risk Assessment

## Supply chain



# 87%

Share of certified fibres in LWC. In accordance with Chain of Custody standards FSC® or PEFC™

# 304

thousand cubic metres of fresh wood supplied to the mill for paper production. This wood is all sourced from Scotland and helps to ensure the future of Scottish Forest Industry.

## Employment



# 494

number of external employees involved in the annual shutdown in May 2017.

# 60

number of contractual employees onsite regularly (min 3 days per week)

# Air



There were some operational difficulties within the CHP boiler during 2017 encompassing both the fuel feeding systems and the air distribution within the boiler. This resulted in 3 ELV breaches for NO<sub>x</sub> and CO during the month of April. These breaches were only marginally above the ELVs. Maintenance to the fuel feeding systems was undertaken during the annual shut in May which has proved successful with no further instances of fuel blockages resulting in emissions outwith consent levels.

Emissions to air were at a similar level to 2016 with very little changes to NO<sub>x</sub>, SO<sub>x</sub> and CO<sub>2</sub> emissions. Particulate emissions increased by 18% primarily due to some issues with the bag filter maintenance, however at no point were any ELVs breached

for particulates. In accordance with EPRT (European Pollutant Release and Transfer Register) annual emissions to air have been reported to the regulator (SEPA) with explanations of any changes to pollutant emissions deviating more 10%.

Work with the fuel suppliers continued in 2017 to increase the fuel quality and reduce the overall moisture of the fuel feed. This work will continue in 2018 to aid a more homogenous supply and ensure higher efficiencies of the boiler.

The performance of the CHP boiler in 2017 was very good with only 87 hours of downtime outwith the annual maintenance shut. There was only one instance of a boiler tube leak which occurred in March.

# Waste

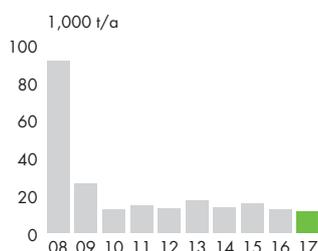


Continued work with our waste contractor ensures that all waste leaving site is recycled or reused with zero waste to landfill.

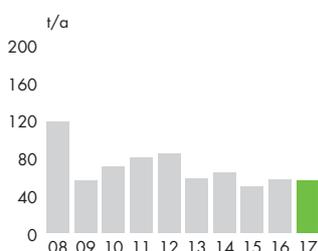
Waste volumes increased by approximately 10% with increases in both ash residues and woodwastes. Investigations are ongoing to establish the reason for the increased ash residues and plans will be put in place to minimise ash residues.

The flyash residues which are produced during combustion in the CHP boiler are classified as hazardous waste however this is used in the consolidation of liquid hazardous wastes at the waste contractor's site to minimise the environmental impact. An alternative disposal route which involved screening of the flyash and reusing a proportion for construction purposes, which occurred during 2017 has proved to be economically unviable and will not be progressed into 2018.

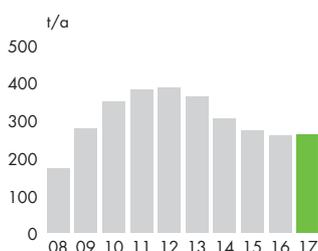
**Fossil carbon dioxide, CO<sub>2</sub>**



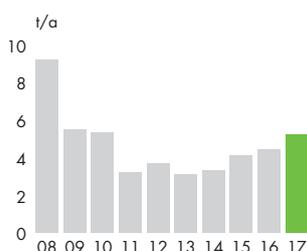
**Sulphur dioxide, SO<sub>2</sub>**



**Nitrogen oxides, NO<sub>x</sub>**

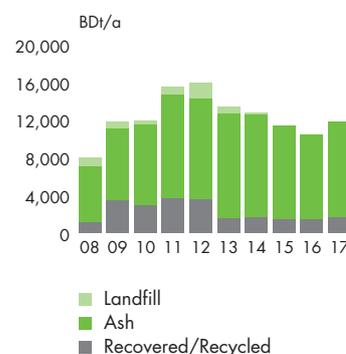


**Particulates**



t/a refers to tonnes per annum

**Solid waste**



All waste volumes based on dry tonnes

# Water

Both fresh water usage and effluent volumes are of key focus in the paper-making process with a reduction in both fresh water and effluent volumes achieved in 2017.

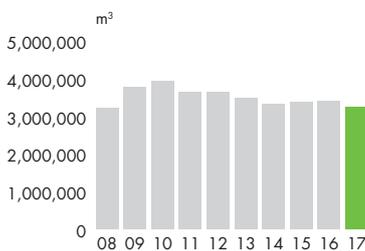
The effluent from the mill undergoes primary effluent treatment onsite prior to secondary treatment at the municipal effluent plant. Performance of the

primary effluent treatment remains at a very good level with reductions in total solids in comparison to 2016 levels. Both COD and BOD<sub>5</sub> were at similar levels to 2016. All emission limits were within consent levels.

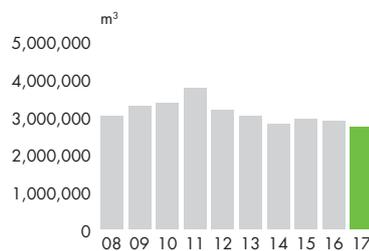
During 2017 Caledonian commenced discussions with a third party to treat all effluent at the local secondary effluent

treatment plant. This project is underway with a new effluent inlet being established and further construction work for screening planned for the annual shutdown in 2018. It is envisaged that all work will be complete and new contract agreed for treatment towards the second half of 2018

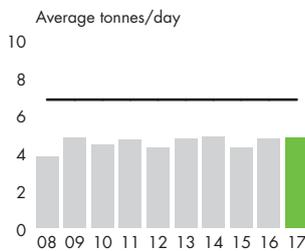
**Freshwater Consumption**



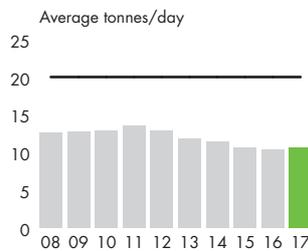
**Effluent Volume**



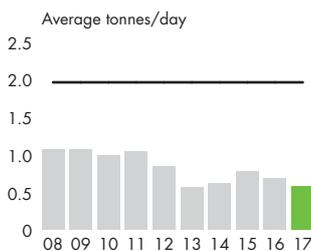
**Biological oxygen demand, BOD<sub>5</sub>**



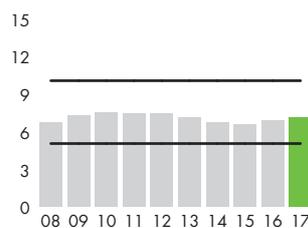
**Chemical oxygen demand, COD**



**Total suspended solids, TSS**



**Effluent PH**



— Limit value

— Upper and lower limit

# Societal responsibility

## Apprentice of the Year

Currently there are 7 maintenance apprentices onsite working towards qualifications in mechanical, electrical or instrumentation qualifications. These young people will undergo training throughout the site while undertaking studies at a local college on a weekly basis.

One of our apprentices last year received an award for Apprentice of the Year while another of our apprentices was nominated as a finalist. Blair Larmour was named Ayrshire Apprentice of the Year 2017 at the award ceremony on Friday 22 September 2017, and Andrew Hunter was nominated as a Finalist.

There were 35 apprentices from all over Ayrshire who made the final nomination list to be judged for Apprentice of the Year 2017.

The final nominations included apprentices from the three Ayrshire Councils from various organisations including: GSK; Aerospace Systems; Spirit Aero

Systems; Hill house Quarry; Stagecoach; Ardagh Glas; GE Caledonian; MacKenzie Construction; Barratt Homes and Cunninghame Housing Association, for Blair to win this award confirms we have a very high calibre of young people working at UPM Caledonian. The judging panel included the Principal of Ayrshire College, Heather Dunk, the Chairman of Strathclyde Business School, Sir Iain MacMillan and David Watt, Director, Institute of Directors, Scotland.

The judges interviewed all shortlisted candidates, taking into account a number of key factors relevant to the employability of each, including skills level, personal attributes, longer term ambitions and relationship with others in the workforce.

We have a fantastic young team of apprentices in UPM Caledonian and we are delighted that Blair was named Apprentice of the year. Highly qualified employees are the basis for the future success of our site", says Gordon McLean, Technical Director.

## Visits to Site

As with many industrial sites Caledonian Paper hosts many visitors throughout the year. A visit to a Paper mill is extremely interesting and beneficial in providing certain facts on how paper is made and the key component in its manufacture – wood – is a renewable source of fibre.

One such visit during 2017 involved a film crew from BBC 1 for the television series 'The Forest' which was aired on television in January 2018. This 6 part series revealed the hidden world of the Galloway Forest which is the largest forest park in Britain. This forest is situated within 60 miles from the Caledonian site and produces 500,000 tons of timber per year, some of which is destined for Caledonian Paper. Filmed over 6 months 'The Forest' followed all the different people and timber related organisations that benefits from the forest park. The filming took place onsite looking at deliveries of timber to site to be used as fibre in the paper-making process and for biomass fuel to be used within the CHP boilerplant.



The program was very informative for the general public in supporting the Scottish timber industry and detailing the infrastructure around forests from the planting of trees, harvesting, transportation and its ultimate use in other industries.

With responsible forest management, European forests have grown by over 30% since 1950.

### **Caledonian Charity Fund**

The Caledonian Paper Charity Fund was established in 1995 with the ultimate aim of providing charitable donations to local groups to enhance the quality of life. Employees contribute a donation from their salary on a monthly basis with UPM Caledonian matching these contributions.

Throughout the year contributors to the scheme can nominate appropriate causes to be considered for a donation. Very often the suggested nominations are charities that have supported the family and friends of employees at a very difficult time. Annually all the

nominations are considered and the committee will agree which charities will receive a donation from the fund. In 2017 the following charities were selected sharing a fund of £7,500

- Ayrshire Hospice
- Headway
- Epilepsy Connections
- Lupus (Ayrshire)
- Prince and Princess of Wales Hospice
- Unity Grill
- North Ayrshire Care and Share Group

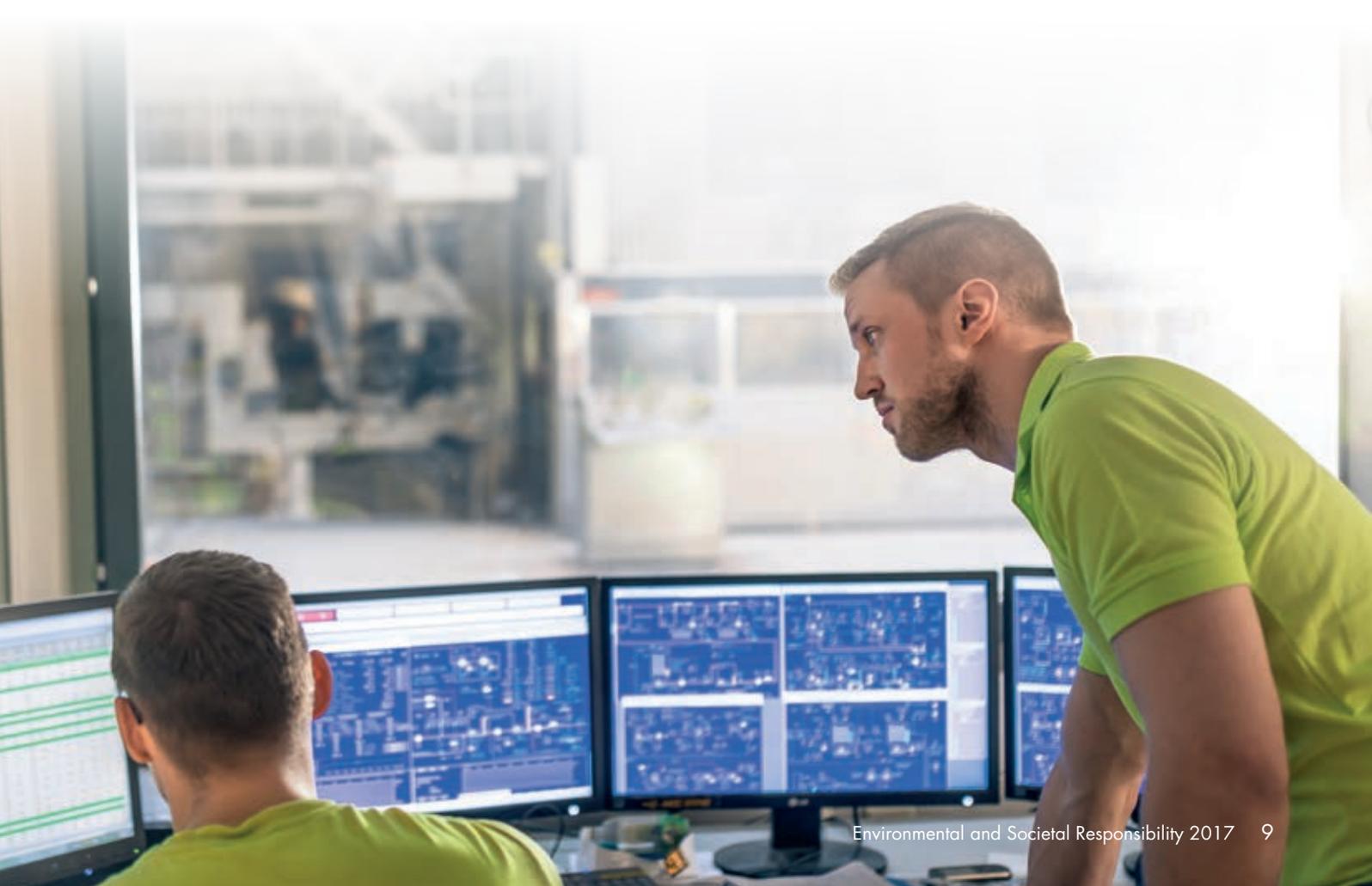
### **Responsible Sourcing & Qualified Supplier Spend**

UPM is committed to responsible sourcing practices throughout the entire supply chain. We work closely with our suppliers to ensure that our suppliers understand and meet all of the company's requirements on sustainability and responsibility.

UPM requires its supplier to apply the UPM Supplier Code and Third Party Code that defines suppliers' minimum compliance requirements in terms of

responsibility with regard to matters such as environmental impact, human rights, labour practices, health and safety, and product safety. The Supplier Code is complemented with more detailed rules, guidelines and supplier requirements, such as the list of Restricted Substances for paper and pulp businesses.

Suppliers' environmental and social performance is followed through regular data collection and analysis. Based on the risk assessments we carry out, we select the suppliers whose performance we want to study more closely. If any non-conformances are found, the supplier is obligated to make corrective actions. We follow actively the results of these actions, and are ready to support our suppliers with our know-how in order to help them to enhance their performance.



# 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.

<b>Production capacity</b>	Paper LWC	260,000 t
<b>Raw materials (BDT)</b>	Pulp Pigments Process Chemicals	See UPM Corporate Environmental Statement for more information
<b>Energy</b>	Biogenic Fuels Fossil Fuels Electricity	See UPM Corporate Environmental Statement for more information
<b>Emission to air</b>	Sulphur Dioxide, SO <sub>x</sub> Nitrogen Dioxide, NO <sub>x</sub> Carbon Dioxide (fossil) Particulates	55 t 260 t 11,309 t 5 t
<b>Water intake</b>	Fresh Water	3,232,142 m <sup>3</sup>
<b>Discharges to water</b>	Chemical Oxygen Demand (COD) Total Suspended Solids Biological Oxygen Demand (BOD <sub>5</sub> ) Effluent Volume	3,889 t 208 t 1,740 t 2,700,880 m <sup>3</sup>
<b>Waste (and by-products)*</b>	Landfill Materials Recycling – Boiler Ash – Metals – Bark & Other Wood Residues – Other Energy Recovery Composting Hazardous Waste Recovery Rate	0 t 11,471 t – 10,185 t – 217 t – 778 t – 291 t 290 t 21 t 22 t 100%
<b>Size of mill area</b>		33.1 ha

\* Dry Weight



# Performance against targets in 2017

TARGET	ACHIEVEMENT	COMMENTS
<b>1 Clean Run Deviations</b> Zero category 3, 4 or 5 deviations	No	3 category 3 deviations were reported in April 2017 – CO 173 mg/Nm <sup>3</sup> ELV of 150 mg/Nm <sup>3</sup> for 60 min – CO 174 mg/Nm <sup>3</sup> ELV of 150 mg/Nm <sup>3</sup> for 60 min – NO <sub>x</sub> 267 mg/Nm <sup>3</sup> ELV of 250 mg/Nm <sup>3</sup> for 24hrs
<b>2 Cost effective solution to counteract Effluent Treatment Cost Escalation 2017/18</b>	Ongoing	New Effluent agreement In final stages – Connection pit tie in complete May 2017 – New screening facility to be completed May 2018 – SEPA notified for PPC permit authorisation
<b>3 Future wood and biomass strategy</b>	Yes	Dry wood chip supply developed – The moisture content from certain biomass streams has reduced which has aided boiler control

# Targets for 2018

TARGET
<b>1</b> Zero deviations against existing legislative requirements, including PPC permit and Scottish Water consent levels.
<b>2</b> Gap analysis of the new ISO 45001 (previously OHSAS 18001) with plan for compliance against new standard, including implementation of new management systems (Quality First and One Safety Tool) and ensuring that common elements with ISO 14001 are utilised.
<b>3</b> Mill wide cost savings with focus on energy and water reductions.
<b>4</b> Successful implementation of new effluent treatment contract. Building of screening plant and pipe diversion.



## Verifier's declaration on verification and validation activities

BSI, with EMAS verifier registration number UK-V-0002 accredited or licensed for the scope NACE 17 & NACE 16 declares to have verified whether the site(s) or the whole organisation as indicated in the updated environmental statement of the organisation UPM Caledonian with registration number FI-000058 meet 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 this 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 of the site reflect a reliable, credible and correct image of all the sites activities, within the scope mentioned in the environmental statement.

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.

Done at UPM Caledonian on 29/03/18

Richard Edmond  
 BSI Environmental Specialist Client Manager  
 Strategic Delivery UK  
 EMAS Verifier Registration No. UK-V-002.



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