

ENVIRONMENTAL
YEAR

2016

A year of change

For Kotkamills, 2016 was a year of change and a year of particular importance in the history of the company, in terms of production as well as environmental protection. Our long-term printing paper machine was closed down, a new cartonboard machine was built and started up, the mechanical pulp plant was replaced, and major investments were made in environmental protection and energy efficiency.

The high point of the year was the start-up of the new cartonboard machine. The strengths of the consumer board production line include a broad range of coating options and ecological products. The cartonboard is fully recyclable and is manufactured using water and energy more efficiently than before.

In 2016, we obtained a new environmental permit in line with the latest BAT Conclusions. The obligations provided in the environmental permit lay the framework for our operations. The permit limits are stricter than before, particularly for emissions into the air, and solid matter is included as a new permit limit for emissions into water. We have taken the environment into account from the very beginning of the investment project.

Our wastewater treatment process was refurbished during the year. The old anaerobic phase was removed, and the old facilities were reused by building a new aerobic stage to improve the oxidation capacity of the wastewater treatment plant. Other efficiency measures related to water protection included the acquisition of primary and tertiary flotation facilities to control the amount of solid matter and nutrients contained in wastewater. We also improved the continuous analysis of wastewater treatment. Our new analysers enable us to monitor the efficiency of the wastewater treatment plant more effectively than before.

We invested in air protection by acquiring a new black liquor evaporation unit. This has a positive effect on sulphur emissions into the air. It also enables us to prevent odours more effectively.

We cooperated with the authorities closely and transparently throughout the environmental permit process. Kotkamills won the 2016 EIA award for its environmental impact assessment practices in the Flying Eagle project.

Our major measures to improve energy efficiency were successful. The effects of the investments in the new mechanical pulp plant and black liquor evaporation plant began to show in late 2016. The new mechanical pulp plant markedly enhanced electricity efficiency, and the new evaporation unit improved the heat economy of the pulp mill. These will play a key role in the development and manufacture of future products.



JANI HEISKANEN

Environmental Manager

The Flying Eagle project

The Flying Eagle (FE2) project to build a cartonboard machine for Kotkamills Oy in Kotka began on 1 April 2016. The schedule was tight, and the implementation of the environmental permit and EIA processes began immediately after the project had started. Our cooperation with the authorities ran seamlessly, and the conversion project won the 2016 EIA award.

Paper Machine 2, which used to produce printing paper, was closed down on 23 January 2016, and Board Machine 2 was started up on 22 July 2016. The environment was taken into account in the planning, procurement and implementation phases of the project. The new production line consumes less electricity, water and steam per tonne produced than the old Paper Machine 2. The old refiners at the mechanical pulp plant were replaced with a new refiner. Instead of consuming steam, the process to produce refined mechanical pulp generates more steam than it needs. This steam is used to dry cartonboard. The new process also consumes less electricity.

Much attention was paid to the consumption of fresh water in the project. The cartonboard machine uses a water-efficient spraying technology to ensure low consumption of fresh water per tonne produced. Water is removed from the web by means of pressing, which reduces the need for evaporation using steam. The dryer section and the hood of the paperboard machine were replaced. In addition, heat recovery was made more efficient in the production line, along with air conditioning in the production facility. More

than 100 frequency converters were installed on the cartonboard production line to allow for the optimal adjustment of the rotation speeds and energy consumption of the pumps. The process was designed to be simple and streamlined to make cleaning easier and ensure high efficiency and low energy consumption.

At the same time, a new evaporation unit was installed in the pulp mill's black liquor evaporation plant. This reduced the consumption of steam and improved the dry-matter content of the black liquor. The efficiency of the recovery boiler improved and sulphur emissions decreased as a result of the higher dry-matter content.

In addition, a major extension project was carried out at the wastewater treatment plant. Two new micro-flotation basins and an aeration reactor were acquired for wastewater treatment purposes. These replacements ensure that we meet and exceed the requirements of the new environmental permit.



TIMO TALLINEN
Technical Director

2016 | Targets and results

1

WASTEWATER: We did not achieve our goals for reducing wastewater volumes. The ramp-up of the new production line resulted in challenges in terms of predicting water volumes. However, we met all of the annual requirements specified in the environmental permit. With regard to monthly limits, the only exceptions were January and October, when we exceeded the permit limit for nutrients. This was due to major procedures to ramp up or close down production. In January, the specific reasons were a maintenance shutdown of the laminating paper production line and the closing down of the printing paper production line, while a significant production ramp-up caused a short-lived biological disturbance in October.

2

RECYCLED FIBRE: In 2016, we used a slightly smaller volume of recycled fibre than in 2015, but its usage continued at a good level. The most significant reason behind the decrease was the improved production of the pulp mill.

3

ENERGY EFFICIENCY: Our energy efficiency continued to improve in 2016. As a result of higher efficiencies and utilisation rates, changes in operating modes and major investments in energy efficiency, the specific energy consumption of the mill improved by more than 2 per cent compared to the previous year. In this respect, the most significant investments included the new, energy-efficient refiner and the black liquor evaporation unit, which markedly improved the heat economy of the pulp mill. Other factors included the increase in the production of the pulp mill compared to the previous year. In addition, the efficiency of Paper Machine 1 was higher than ever before. A new annual production record was achieved by Paper Machine 7 in Tainionkoski.

4

WASTEWATER TREATMENT: The investment in the wastewater treatment plant was completed on schedule. The plant was started up as planned before the start-up of the cartonboard machine, which ensured we achieved our goals for treatment results.

5

ENVIRONMENTAL PERMIT: Obtaining the new environmental permit necessary for the ramp-up of the cartonboard machine was one of our main goals for 2016. We successfully completed the permit process in close cooperation with the authorities and were issued a new environmental permit in June, in line with our target schedule.

2017 | Environmental target programme

1

OUR TARGET FOR WASTEWATER VOLUMES is 29,000 m³ per day. The year 2017 will be challenging, as we will be busy increasing the production volumes of the new cartonboard production line and optimising our new wastewater treatment equipment. Our targets ensure that wastewater will be treated efficiently and effectively. The reduced specific water consumption of the new cartonboard production line and the investments in the laminating paper production line are a good starting point for the systematic reduction of water volumes.

2

INCREASING THE USE OF RECYCLED-FIBRE RAW MATERIAL continues to be a major environmental target. Considerable increases will be challenging to achieve, as our use of recycled-fibre raw material is already very high, and maintaining the current level requires major input from various organisations.

3

IMPROVING ENERGY EFFICIENCY continues to be an essential part of our environmental goals in 2017. We seek to improve energy efficiency by 2 per cent in terms of specific consumption. In 2017, improved energy efficiency will be better reflected in our operations, with the production volumes of the new cartonboard production line growing and the efficiency of the black liquor evaporation plant increasing.

4

THE OPTIMISATION OF WASTEWATER TREATMENT will be a focus area in 2017. The new cartonboard production line will change the loading in wastewater treatment, calling for continuous monitoring and rapid responses to constantly changing circumstances. To optimise the runnability of the wastewater treatment plant and to minimise the wastewater load, we acquired continuous analysis systems. This will enable us to monitor all values related to the permit requirements in real time.

5

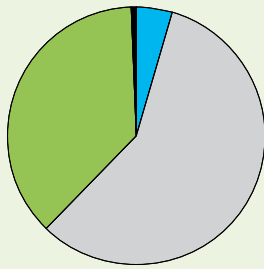
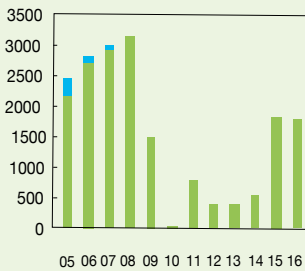
THE NEW ENVIRONMENTAL PERMIT requires us to carry out studies and meet additional obligations. The new environmental permit and its requirements are a key guideline for our operations. Our main goals include completing the studies and meeting the additional obligations specified in the new permit and putting the related changes into practice in our organisation.

6

THE ANALYSIS METHODS FOR WASTEWATER EMISSIONS need to be further developed as well. The constant improvement of environmental protection and continuous process development are an essential part of our day-to-day operations. One example of this is our investment in continuous analytics with regard to wastewater emissions into the sea. The new analysers enable us to monitor wastewater treatment in real time and to respond to changing circumstances without delay. Our goal is to monitor environmental effects more effectively, as well as to develop more transparent reporting practices.

Figures | Environmental loading

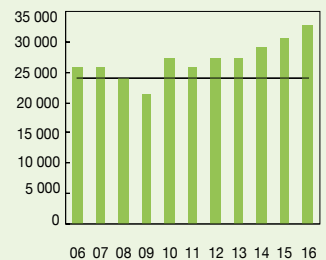
Distribution of waste



■ Soda precipitate
■ Coating paste to industrial landfill

■ Reuse
■ Reused to produce energy
■ Landfill
■ Hazardous waste

Wastewater m³/d

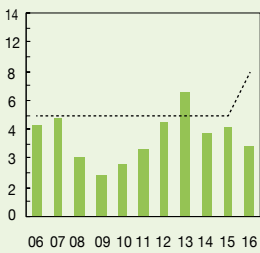


— Kotkamills' target

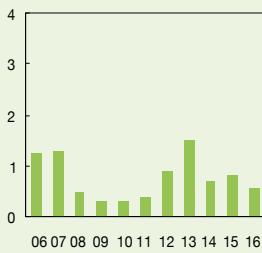
Wastewater emissions

----- Permit limit

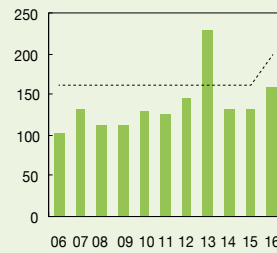
COD t/d



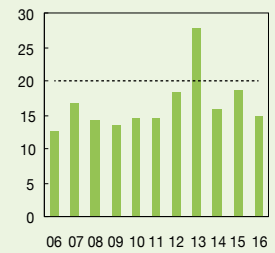
BOD t/d



Nitrogen kg/d

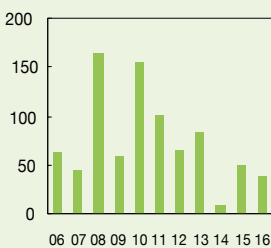


Phosphorus, kg/d

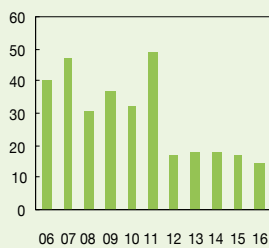


Emissions into the air

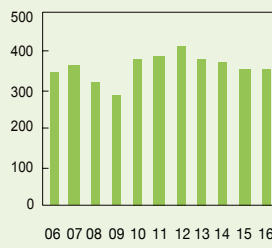
SO₂, t/a



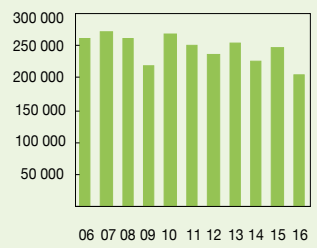
Fine particles (PM), t/a



NO₂, t/a



CO₂, fossil, t/a



FIGURES | Environmental loading

Environmental permit and environmental loading: Kotka

WASTEWATER EMISSIONS

Wastewater	12 million m ³
Solid matter	584 t
BOD	208 t
COD	1,752 t
Nitrogen	57 t
Phosphorus	5,5 t

WASTE

Reuse	39,936 t
Landfill	1,805 t
Hazardous waste	198 t

EMISSIONS INTO THE AIR

CO ₂ fossil	205,715 t
CO ₂ biol.	255,107 t
SO ₂	37 t
TRS (sulphur)	5 t
NO _x (NO ₂)	352 t
Dust	15 t

RAW MATERIALS

Logs	431,662 m ³
Woodchips	90,232 m ³
Sawdust	721,720 m ³
Purchased pulp	40,521 t
Recycled fibre	29,783 t
Chemicals	67,000 t
Raw water	13 million m ³

FUELS

Natural gas	3,717 TJ
Biofuels	2,351 TJ
Purchased electricity	0 GWh

BY-PRODUCTS

Turpentine	181 t
Soap	6,968 t

Our mill has an **ISO 9001** quality management system, an **ISO 14001** environmental management system, an **OHSAS 18001** occupational health and safety management system and an **ISO 22000** food safety management system, as well as **FSC** and **PEFC Chain of Custody** systems.

Our cartonboard machine investment enables us to reduce our consumption

steam by **11 %**

electricity by **28 %**

water by **21 %**

ENVIRONMENTAL
YEAR

2016

Kotkamills Oy
P.O. Box 62-63
FI-48101 Kotka

www.kotkamills.com