Environmental work at Braviken Paper Mill

Braviken Paper Mill produces MF Magazine, book paper, newsprint and coloured newsprint from thermo-mechanical pulp (TMP). The mill is located alongside Bråviken, a deep bay in the Baltic Sea with good water turnover.

Innehåll

Environmental activities 2018

All limits for emissions to water and air as set out in Braviken's environmental permit were complied with in 2018. The guideline values for emissions to water of organic material (COD), suspended solids (SS) and phosphorus (P) were exceeded in the first quarter of the year. The guideline value for COD was also just exceeded in August and September. No complaints about the site were made by the public and no disruptions to operations or similar incidents occurred on the site that could lead to adverse effects on people and the environment.

In order to improve Braviken's water treatment, five surface aerators in the biological treatment stage were replaced with new ones with a better oxygenation capacity, in order to further reduce organic material (COD).

To further improve water treatment, Braviken will treat a partial flow of the process water from the production of thermo-mechanical pulp, which contains high amounts of COD, with the help of MBBR (Moving Bed Biofilm Reactor) technology. Work on installations began in 2018 and the equipment is planned to be commissioned in early 2019.

Braviken has spent many years minimising its combustion of oil, and has brought its oil consumption down from around 25 500 m^3 in 2005 to around 6 000 m^3 in 2018, representing a cut of approximately 80 per cent. The fall in oil consumption is largely attributable to improvements in the operational strategy for Braviken's steam system, greater efficiency in the solid fuel boiler and increased steam recovery from the production of thermo-

mechanical pulp. The mill's steam and heat needs can now usually be covered by steam recovery from the production of thermo-mechanical pulp and from the combustion of biofuel. Braviken's oil-fired boiler is primarily used during shutdowns of the solid fuel boiler for maintenance.

Energy integration between the paper mill and nearby Braviken Sawmill was implemented in 2010, making it possible for the paper mill to meet the sawmill's heat energy needs. The sawmill supplies chips to the mill that are used in the production of paper, which cuts down on the need for transport, among other benefits. The sawmill also supplies the paper mill with biofuels.

Permits for operation

Braviken Paper Mill holds a permit for its operations granted under the Environmental Code in 2002.

Braviken Paper Mill applied for and was granted a temporary change to its conditions for COD and SS in 2018–2020. Water treatment measures continue.

The mill also has a water judgment from 1975 concerning its sourcing of raw water from Motala Ström.

The mill is covered by the rules on fossil carbon dioxide emissions trading, under which it holds a permit for carbon dioxide emissions and has been allocated emission allowances for the period 2013–2020.

Since the 2015 Environmental Report, the mill's outcomes and status have been reported in relation to current BAT conditions.

Environmental certification

The environmental management system has been certified to ISO 14001 since 1999.

The energy management system has been certified to ISO 50001 since 2012. Before that, the energy management system had been certified to SS 62 77 50 since 2006.

The health and safety management system has been certified to OHSAS 18001 since 2015.

Braviken Paper Mill has held chain-of-custody certification for wood raw material since 2008.

In 2013, Holmen Paper had its graphic paper approved to carry the EU Ecolabel. Products awarded the EU Ecolabel meet the ecolabel's criteria concerning the manufacturing process in terms of certified wood raw material, chemical consumption, energy consumption and emissions to air and water.

Braviken's products also fulfil the requirements for Nordic Swan Ecolabelling of paper products.

Disruptions to production and complaints

The guideline values for emissions to water of organic material (COD), suspended solids (SS) and phosphorus (P) were exceeded in the first quarter of the year. The guideline value for COD was also just exceeded in August and September. Measures to improve water treatment continue. Five occasions in which values were exceeded were reported to the County Administrative Board. No complaints concerning the mill's operations were received from the public.

Investments/environmental and energy measures

In order to improve Braviken's water treatment, five surface aerators in the biological treatment stage were replaced with new ones with a better oxygenation capacity, in order to further reduce organic material (COD).

To further improve water treatment, Braviken will treat a partial flow of the process water from pulp manufacturing, which contains high amounts of COD, with the help of MBBR (Moving Bed Biofilm Reactor) technology. MBBR is a biological treatment technology with bio-carriers and a diffused aeration system. Work on installations began in 2018 and the equipment is planned to be commissioned in early 2019.

Follow-up of environmental and energy targets in 2018

Braviken is to help reduce emissions of fossil carbon dioxide. Braviken had a target for 2018 of limiting oil consumption to a maximum of 3 000 m^3. Oil consumption for 2018 was around 6 000 m^3 and the target was not achieved. This was due to problems keeping the oil-fired boiler in warming mode, more and longer maintenance shutdowns on the solid fuel boiler (wood-fired) than planned, and a lack of chips in the spring. During shutdowns of the solid fuel boiler for maintenance, the mill's oil-fired boiler was used.

Braviken had a target for 2018 to bring specific electricity use for the production of paper down to 2.8 MWh per tonne of paper, including the electric boiler, which equates to 1 per cent less than the budgeted electricity use. The target was not achieved. The specific electricity use for the production of paper was 2.9 MWh per tonne of paper in 2018. The reason was unplanned production stoppages, partly due to several storms during the summer.

Planned environmental and energy measures in 2019

Work on minimising the use of oil to meet the mill's steam and heat needs will continue into 2019. A considerable portion of the mill's steam and heat needs will be covered by steam recovery from the production of thermo-mechanical pulp and from the combustion of biofuel.

There are plans to continue optimising steam production during periods of low steam demand (summer months).

In 2019 Braviken will start to use HVO (hydrotreated vegetable oil) as a fuel in forklifts for internal transport, which will gradually replace ordinary fossil diesel and LPG.

Environmental and energy targets 2019

Braviken has targets relating to areas including energy efficiency and oil consumption. Braviken has managed to reduce its oil consumption and the mill continues to focus on keeping its oil consumption low. The energy targets are intended to reduce the use of electricity and heating and to increase heat recovery.

Braviken is to help reduce emissions of fossil carbon dioxide. Braviken has a target for 2019 of limiting oil consumption to a maximum of 3 000 m^3.

Braviken has a target for 2019 to bring specific electricity use for the production of paper down to 2.8 MWh per tonne of paper, including the electric boiler.

Water environment at Braviken Paper Mill

Bråviken

Bråviken as a receiving body of water is monitored by the Motala Ström Water Conservation Association, of which Braviken Paper Mill is a member. This association submits an annual report of tests on the level of pollution and other factors of significance to the condition of the water throughout the aquatic system.

The description of the condition of Bråviken below is based on data from the Motala Ström Water Conservation's compilation for 2017. The Motala Ström Water Conservation Association's compilation for 2018 will be posted on the website motalastrom.se in May 2019.

The north coast of Bråviken is a fault scarp with a few vertical, tall cliffs that tumble down to the bay. The southern shore of Bråviken is significantly flatter and largely consists of farmland. At the innermost point of the bay, Bråviken is fairly shallow and has a large inflow of freshwater from the River Motala Ström. Water turnover is relatively rapid in the bay, and the entire volume of water is replaced in about one month. The coastal waters of Bråviken are affected by nutrient inputs from agriculture in the southern reaches and by inward transport from the whole catchment basin of the Motala Ström.

Plant nutrients

An overall assessment has been made of the status of the coastal points with regard to nutrients according to the Swedish Environmental Protection Agency's principles of assessment. The assessment was carried out over three years (2015–2017). The assessment includes summer values for total nitrogen and total phosphorus with winter values for total nitrogen, total phosphorus, dissolved inorganic nitrogen and dissolved inorganic phosphorus. The status of the inner reaches of Bråviken, which are close to the Braviken Paper Mill, was unsatisfactory in 2015–2017. According to the Motala Ström Water Conservation Association summary for 2015–2017, the status was unchanged in inner Bråviken compared with measurements for the previous year. The status as regards total nitrogen was much better than the status for total phosphorus.

Oxygen

Points which were not below the limit value stated in the principles of assessment (3.5 ml/l in the bottom water) in any measurement have been classified as having high status (no oxygen deficiency occurs). The status of the inner reaches of Bråviken was high in 2015–2017.

Visible depth

The status of the coastal points with regard to visible depth has been assessed on the basis of the principles of assessment. The status of the inner reaches of Bråviken was unsatisfactory in 2015–2017. In the coastal waters, there is a clear link between visible depth and chlorophyll levels. The visible depth is often less in the summer, due to the higher quantity of particles in the water, in the form of plankton. Visible depth can therefore be a good indicator of plankton levels in the water, which in turn is affected by the supply of nutrients. If sampling is performed close to major freshwater inflows with high levels of humus and clay particles due to high surface run-off, this may have an impact on the visible depth.

KPI production and environment Braviken Paper Mill

Production and environment	2018	2017	2016	2015	2014
Braviken Paper Mill, Production, '000 tonnes					
Paper	521	521	520	486	530
Raw materials, '000 tonnes					
Wood, million m^3 solid volume under bark	0,98	1.17	1.16	1.07	1.11
Purchased pulp	-	-	8.8	2.0	1.3

Water consumption, million m^3	16.1	14.5	13.9	15.3	15.9
Chemicals[1)]	19.9	17.2	13.9	13.6	15.7
Filler, pigment[1)]	49.2	42.4	41.9	49.5	31.4
Thermal energy, GWh					
Production at mills from recovered liquors, bark and wood residues	235	280	223	261	263
Recovered in the TMP process[2)]	468	468	551	484	515
Fossil fuels	56	47	42	30	30
Electrical energy, GWh					
Production at mill	5	4	3	5	10
Emissions to air, tonnes					
Sulphur dioxide (counted as sulphur, S)	6.4	5.3	0.7	1.8	1.4
Nitrogen oxides	71	74	65	82	86
Particulates	0.6	0.5	0.5	0.4	0.4
Carbon dioxide, '000 tonnes					
Fossil	13,9	11,0	10,0	6.6	6.1
Biogenic	108	84	77	78	106
Emissions to water, tonnes					
COD (organic matter), '000 tonnes	2.4	2.3	2.0	1.3	1.2
Suspended solids	447	424	176	136	137
Nitrogen	54	49	38	38	39
Phosphorus	3.2	3.1	2.9	2.5	2.0
By products, '000 tonnes					
To energy production, internally/externally	137	139	135	103	101
Utilised or for recovering[3)]	52	53	48	58	68
Waste, '000 tonnes					
Hazardous[4)]	0.18	0.10	0.08	0.13	0.22
Sent to landfill (wet)	0.3	0.2	0.2	0.3	4.5
Energy deliveries, GWh					
Thermal energy, GWh[5)]	93	91	104	104	79

1. 100 per cent active substance. The quantity of commodities was 27 060 tonnes for chemicals and 77 790 tonnes for filler and pigment.
2. Thermal energy is produced from the electricity used in the production of thermo-mechanical pulp at Braviken Paper Mill this is recovered and used in production.
3. By-products used, for example, as filling material, construction material or for the production of soil products.
4. Hazardous waste is dealt with by an authorised collection and recovery contractor.
5. Thermal energy from the mill to Braviken Sawmill.