

# EMAS 2023



# environmental report 2023

## Arctic Paper S.A.

Arctic Paper S.A. is one of the leading European manufacturers of bulky book paper and graphic fine paper. The Group produces high quality coated, uncoated woodfree and uncoated wood-containing papers. The Group's product portfolio consists of the brands Amber, Arctic, G and Munken. Production takes place in Poland and Sweden.

The total annual production capacity of the Group's three paper mills is abt. 630 000 metric tonnes. The Group currently employs about 1 200 people across Europe and we manage 14 sales organisations across Europe. Our head office is situated in Poznań (Poland) with a branch in Gothenburg (Sweden).

The Arctic Paper Group has been listed on the Warsaw Stock Exchange since October 2009 and since December 2012 on NASDAQ OMX in Stockholm.

## Arctic Paper in Europe



- – sales offices
- – papermill
- – head office

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Arctic Paper Munkedals AB is a part of the Arctic Paper Group, and in 2023 our turnover was 1,5 billion SEK. Our largest markets are Germany, Sweden, the UK, France and Benelux and sales are channeled through the Group's own sales offices, agents and whole-salers, or direct to publishers and printers. Arctic Paper Munkedals AB has approximately 330 employees and is situated on the west coast of Sweden by the Örekil River, one of the country's finest salmon waters. The Örekil River flows into the unique Fjord Gullmarn.

Both the river and the fjord are areas of outstanding natural value. Paper manufacture started at Arctic Paper Munkedals AB in 1871, and we are now one of Europe's leading manufacturers of uncoated graphic paper. Our paper is used mainly for printed advertising, periodicals and books. Because of our sensitive location, we were forced at an early stage to adapt our production to suit the natural environment. We manufactured our own pulp until 1965, when we stopped for environmental reasons.

Our aim is to be the better environmental alternative in a market where customers through their choice of supplier can contribute to a sustainable future.

# preface



The uncoated paper from Arctic Paper Munkedals AB with a high content of certified renewable raw material are ideally suited to a sustainable society. We are wholeheartedly committed to staying one step ahead of public authorities' demands and to continuously improving our environmental standard. In the investments made, environmental considerations have played an important role, significant environmental improvements have become a reality year after year. Our water use, as well as our emissions to water are today among the lowest in the industry.

The guiding star in our environmental work is that in every step of the process, primarily in our own factory but also with our suppliers, work to ensure that given resources are used optimally, whether it applies raw materials, energy, chemicals or water. Our vision is to create a completely closed water system in our production process, something that would completely eliminate emissions to water and mean a reduced energy requirement.

With the help of our environmental management system ISO 14001 and EMAS, we have systematized and streamlined environmental work to ensure continuous improvement. Through our employees' commitment and local anchoring, we have naturally integrated environmental work into the day-to-day operations. After many years of systematic work and a genuine interest, sustainability is now part of our DNA as a manufacturer.

In our EMAS report, we describe our operations, the environmental impact we cause and how we work to minimize this. In the report, we follow up on the environmental goals for the year 2023 and describe the environmental goals and action plans that have been established for the year 2024.

In February 2023, we were certified according to the energy management system ISO 50001. This certification will constantly aim to streamline energy use and increase the share of renewable energy.

The work with the fish habitat improvements in the Munkedal River has during 2023 continued. Stones and blocks have once again been placed in the river after being removed during the 17th century floating cleanings. This is to improve living conditions for Salmon and Trout in particular.

The new energy plant that has been started in collaboration with the company ADVEN / Värmevärden, came close to full effect in 2023. This collaboration enables a large and important change in the company's energy production. A secured energy supply based on the combustion of RDF fuel *Refused Derived Fuel* and biofuel creates a stable foundation for the future.

In addition to the daily work with energy savings, the speed control of pumps where in focus and gave a good effect in 2023, we have also seen during the year that our pilot project regarding a smaller solar cell installation on a roof within the utility area has proven to work well and opens for future opportunities.

By treating environmental issues as a natural part of all operations and report our environmental impact openly and clearly we want to strengthen our stakeholders' faith in us at Arctic Paper Munkedals AB.



Kent Blom, CEO Arctic Paper Munkedals AB

# fact Arctic Paper Munkedals AB

## Brands

Munken Design Range:	Munken Lynx, Munken Pure, Munken Polar, Munken Kristall Munken Pure Rough, Munken Polar Rough, Munken Lynx Rough Munken Kristall Rough
Munken Book Papers:	Munken Premium Cream, Munken Premium White Munken Print Cream, Munken Print White Amber Graphic by Arctic Paper Munkedal
Munken Kraft Papers:	Munken Kraft and Munken Kraft Highwhite

## Energy

Steam (oil, LNG)	42 MW	Capacity 160 000 tonnes/year
Steam (electricity)	35 MW	Sales Export 90%, Sweden 10%
Own water turbines	4,5 MW	Employees 300

## Paper machines

	Width	Grammage	Speed	Capacity
PM 5	3,22 m	60-240 g/m <sup>2</sup>	750 m/min	75 000 tonnes/year
PM 8	3,97 m	60-150 g/m <sup>2</sup>	800 m/min	85 000 tonnes/year

## Sheet cutters

	Width	Lenght	Capacity
S1, S2, S3*, S11, S12 *) laminating machine	35 - 168 cm	42 - 188 cm	80 000 tonnes/year

## Storage capacity:

Munkedal	4 500 ton
Uddevalla (central storage)	ca 5 000 ton (part of a company shared warehouse 20 000 m <sup>2</sup> )

## Certifications

Environmental management system ISO 14001:2015 - Qvalify cert no: 1005  
 Environmental management system EMAS 1221/2009 - S-000248  
 Quality management system ISO 9001:2015 Qvalify cert nr:1005  
 Energy management system ISO 50001:2018 – Bureau Veritas cert no: SE009197  
 Chain of Custody FSC® - SGS-COC-001693  
 Chain of Custody PEFC™ - SGS-PEFC/COC-0634  
 Cradle to cradel Certified® at Bronze level



The mark of responsible forestry



# environmental management

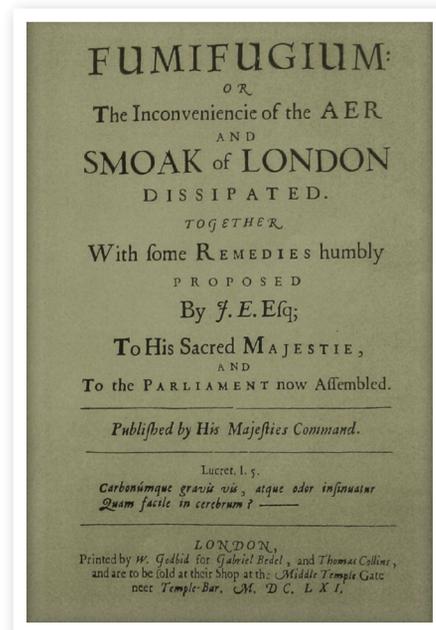
## Awareness

In the modern history of mankind, the understanding of the interplay between people and the environment became marginalised at an early stage. Natural resources were regarded as being infinite and the human impact as negligible. The problems focused on were primarily those that tangibly and directly affected health. To make possible a systematic approach, methods for environmental review were developed, thus laying the foundation for additional environmental management.

In Fumifugium, John Evelyn published in 1661 "The Inconveniencie of the Aer and Smoak of London dissipated" which was the predecessor of the modern environmental review.

## Concern

Environmental management can be defined as becoming aware in a structured way and gradually reducing one's negative impact on the environment. EMAS and ISO 14001 are the specification documents that form the backbone of our environmental management systems. They are not only certificates of legal compliance, they also promote continuous improvement by means of routines, audits, objectives and programs.



## Arctic Paper a pioneer

Today, there are many incentives behind the work on reducing the negative environmental impact and with its long-term commitment and well-established systems, Arctic Paper is a group with a clear focus on reducing environmental impact, increasing efficiency and an open dialogue.

# environmental policy

Arctic Paper Munkedals AB's business concept is to produce and market uncoated paper of high quality. At the same time, we shall be known for pursuing a sustainable environmental work and being able to offer our customers environmentally adapted products.

By means of continuous improvements to our operations and management systems as well as great commitment, we shall always deliver paper of high quality within the respective product segments, improve our energy performance as well as minimise and prevent negative environmental impact from the products and services that we buy, manufacture and sell.

We shall satisfy and preferably surpass prevailing applicable legislation and fulfil other environmental, energy and quality demands made on us and work together to prevent environmental accidents.

This means that we must:

- Make environmental, energy and quality work an integrated part of the company's long-term sustainable strategy by drawing up rules and procedures at management group level defining how the organisation is organised and business is operated.

- Consult with, inform, educate and engage our employees in environmental, energy and quality issues.
- Produce, market and sell products with the least possible environmental impact.
- Make demands of and prioritize suppliers and contractors who promote raw materials, products, transport activities and services being manufactured and delivered with the right quality and in an sustainable environment-friendly way.
- Consider the environmental and quality impact as well as impact on energy performance at procurement, new investments, new building or renovation, and other changes in the business.
- Openly communicate our environmental work and our environmental impact to the public, customers, suppliers, authorities, and other interested parties so that a commitment is created.

Kent Blom, CEO Arctic Paper Munkedals AB

# paper production

## Pulp reception

The mill does not manufacture its own pulp; instead, it purchases it in the form of bales from external suppliers. After arrival at the mill, the pulp bales are stored in the pulp warehouse until needed.

The pulp bales are slushed in process water, which has been purified internally, and then ground in refiners so that the fibres are softened and swell. Grinding is important for the paper's strength properties. Various raw materials and chemicals such as filler chalk, adhesives and starch are added. The pulp is filtered in several steps to remove foreign particles.

## Paper machine

### Headbox and wire section

The function of the headbox is to distribute the diluted stock over the whole width of the wire. Dewatering and forming of the web take place in the wire section.

### Press section

The web is dewatered still further in the press section. Here, the paper is given the right density and surface structure.

### Drying section

The paper is dried in the drying section with the help of steam-heated cylinders.

### Surface Surface Sizing

After drying, the surface on both sides of the paper is surface sized in a sizing/coating process. Surface sizing the paper gives it a smoother and stronger surface with improved printing properties. The surface is dried after the process with infra driers and a second drying section of steam-heated cylinders.

## Machine calendering and tambour

The web passes through a calender, which gives it its final surface structure. The finished web is rolled onto a tambour and moved to the winding machine.

## Winding machine

In the winding machine, the large reel is divided into smaller reels in line with the customer's order. The different sizes of reels are combined so that the width of the web is optimally utilised.

## Finishing

### Paper cutting machines

The reels proceed for further conversion. In paper cutting machines, they are cut into sheets in varying formats as requested by the customer. Some of the sheets are packaged in an automatic bale packaging machine.

### Pallet pack

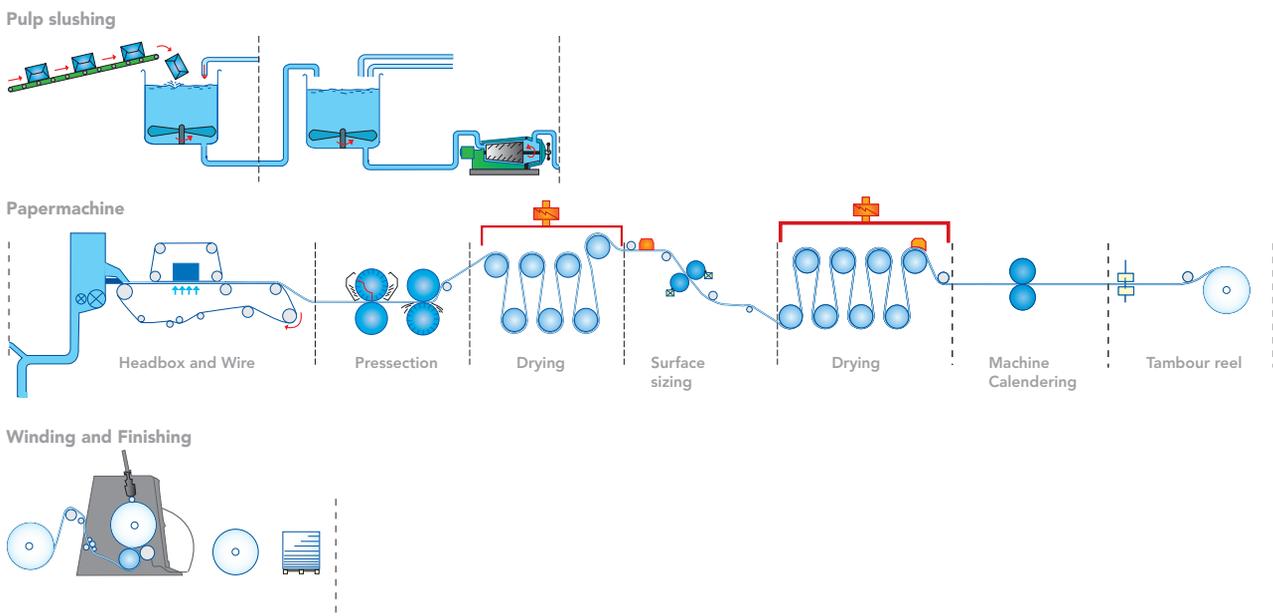
The sheet pallets are provided with a cardboard lid made of recycled paper and shrink-wrapped.

### Reel pack

Reels to be delivered directly to the customer are fitted with protective packaging and labelled so that they can be identified.

## Storage and shipping

The finished reels and pallets of sheets are placed in the mill's warehouse for finished goods until they are released from inventory for transportation to corporate warehouse or the customer by road, rail or sea depending on the customer's geographical location.



# purification

## Purification plant

The process wastewater is channelled to our final purification process. The water is purified through a combination of biological and chemical treatment.

a) The first stage is the buffer tower. This is where the decomposition of pollutants commences. Here we add nitrogen and phosphorus to provide nutrients for the bacteria in the water. Air is blown into the base of the tower, to oxygenate the water.

b) The next stage is a bio-bed, which is filled with solid plastic material and has a very large surface area – roughly equivalent to 10 football pitches (60,000 m<sup>2</sup>). Here a biofilm of bacteria and larger creatures is formed, which continues to break down pollutants in the water.

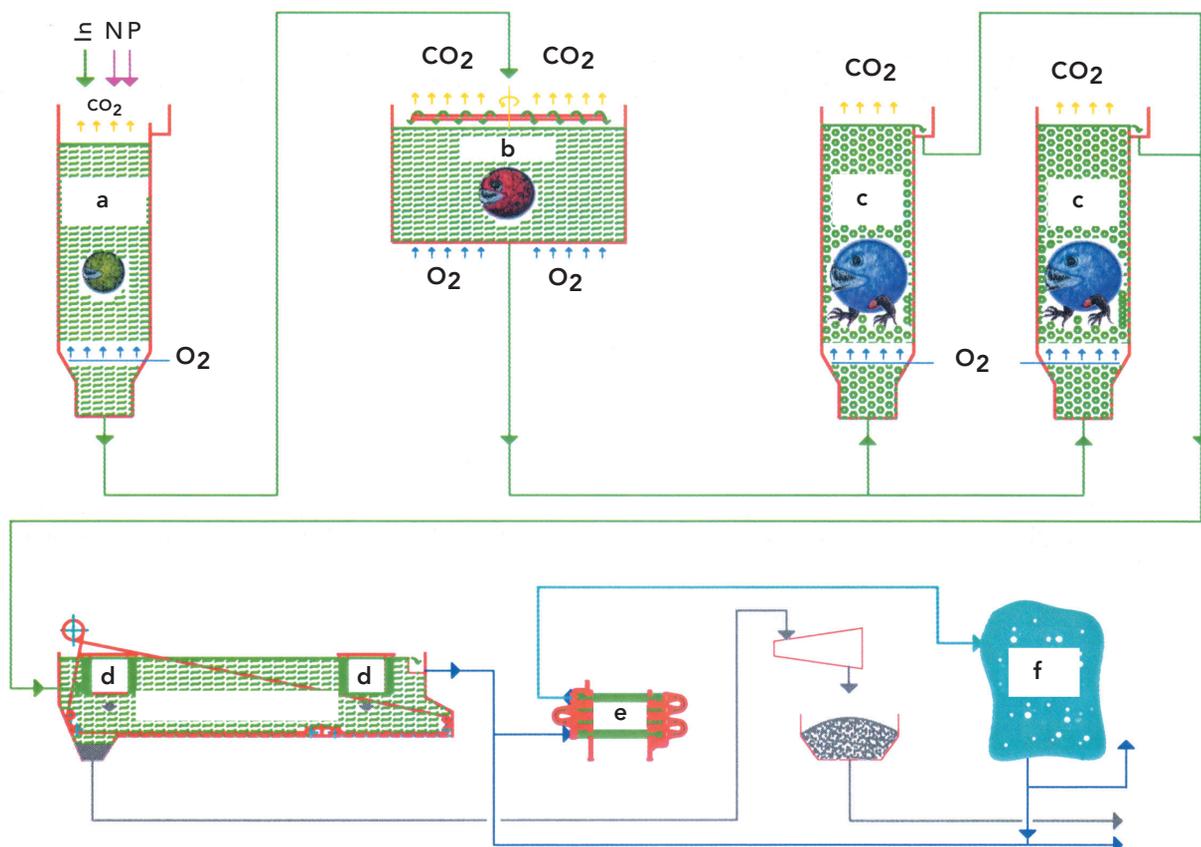
c) The water proceeds to towers with floating material, the surface of which is covered by bio-film. Air is added to make the material circulate in the towers.

The air also serves to ensure that the bacteria and the larger creatures have good access to oxygen, which is necessary for their survival and consequently for the biological decomposition of the surplus water.

d) The next stage comprises two sedimentation tanks, where flocculants are added to separate particles from the aqueous phase. The separated particles go to a centrifuge, where they are thickened, so that they can then be processed for soil improvement.

e) The treated water proceeds to the ultra-filtration plant.

f) The final, treated water from ultra-filtration goes to our external ponds, before being discharged into the Munkedal River or recirculated to the mill.



# environmental data and regulations

The raw materials, chemicals and the energy needed to manufacture 1 tonne of paper in 2023 (2022) are specified below. The emissions to air and water and the amount of waste this gives rise to are also reported. Finally, we report

on how we complied with the regulations laid down by the authorities. Applicable environmental requirements are specified in the environmental report to the authorities and can be ordered from EMAS contact persons.



## Compliance with permit conditions

Production level net

## Max permit

200 000

## Result 2023

105 423 tonnes/year

## Discharges to water

Suspended solids

150

106 kg/day

COD<sub>Cr</sub>

450

282 kg/day

BOD<sub>7</sub>

120

77 kg/day

Total Nitrogene (N)

20

11,5 kg/day

Total Phosphorus (P)

2

1,2 kg/day

## Discharges to air

Sulphur

90

0 tonnes/year

NO<sub>x</sub>

70

\*\* mg/MJ oil

Dust

1

\*\* g/kg oil

## Other

Noice (night time)

45 dB(A)

Freshwater from river

4,5 l/minute

\* BAT - Best available technique / EU-BREF 2015 (Unintegrated finepaper) Refers to production net slitter machine.

\*\* no emissions over the permit reporting limit

Net slitter machine data gives a figure before the converting area waste is deducted.

# biodiversity

## GULLMARN

### One of Swedens most studied fjords

The water in Swedens largest genuine sill fjord is divided into several layers from Baltic sea, Kattgatt, Skagerrak, Northern sea and the Atlantic.

The depth is home for Twohorn sculpin, Atlantic hookear sculpin and Northern stone crab.

The fjord Gullmarn is Swedens largest fjord. The length is almost 30 km, the width 1–4 kilometer with depths down to 125 meter. Passing the island Bornö the hill Smörkullen rises 134 meter over the sea level. A sill fjord means that it is long, deep and narrow and has a sill at the mouth.

Gullmarn was formed by a fault hollowed out by watercourses and inland ice 560 million year ago. It is the natural border between the 920 million year old red granite in the north and the 1700 million year old area of gneiss in the south.

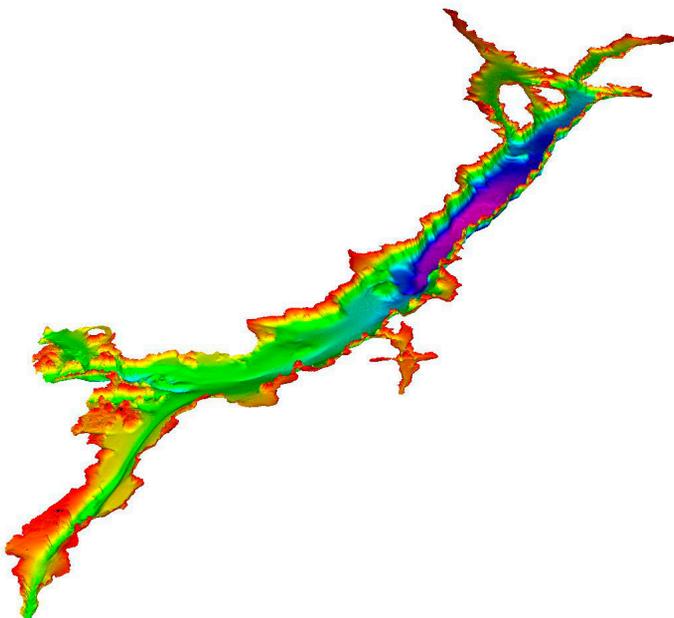


In 1830 scientists and interested parties were gathered on Kristineberg to discuss and to study the biodiversity of Gullmarn. One of these were the artist Wilhelm von Wright who painted – Fishes in Scandinavia, the zoologist Sven Lovén who is claimed to be the first to ever study the biodiversity of Gullmarn and the ornithologist and conservator Gustaf Kolthoff who published the book - Nordic Birds.

Three large ocean streams affects the marine life of Gullmarn. This means that we find water from Baltic sea, Kattegatt/Skagerrak och Northern/Atlantic sea. Due to differences in salinity (content of salt) these water finds their own depths. This stratifications of salinity complicates the water exchange.

With a sill at 40 meters in the mouth of the fjord it causes a unique biology and at the same time a greater vulnerability to pollutants. The depth of 125 meters in Gullmarn has a similar biology and habitat like the 300 - 600 meters depth in the ocean outside the fjord.

In the depths it is almost complete darkness, cold (4-5 degrees celcius) with high salinity (35 per mille). Here we find creatures like the Twohorn sculpin, Atlantic hookear sculpin and Northern stone crab.



Source: Västragötalands Regionen -Västarvet -

# significant environmental aspects

## Gathering aspects

We have identified the most significant environmental aspects in our business. The environmental assessment is based on a holistic approach, where the entire chain from the production of materials used in our products to the shipment of our products is taken into consideration. The significant environmental aspects can then be a focus of environmental work and form the basis of improvement plans.

The significant environmental aspects are produced by drawing up a list of the various activities in the company together with a description of their environmental aspects and environmental impact. The aspects are reassessed as the business develops and the findings of new research become available.

## Selecting aspects

Our environmental assessment considers the following issues:

- Does the aspect cause a known, significant environmental impact, such as environmental threats identified by the Swedish Environmental Protection Agency, or does it counteract the national environmental targets adopted by the Swedish parliament?
- Does it involve high consumption of scarce raw materials, natural assets or energy?
- Does the environmental aspect involve a chemical that is harmful to the environment?
- Could the environmental aspect cause a serious environmental accident?
- Is the size/volume/content of the environmental aspect significant in terms of the environmental impact?

Using this approach, the following significant environmental aspects have been identified

### Transport

for delivery of raw materials and finished product

### Emissions to air

in connection to steam generation

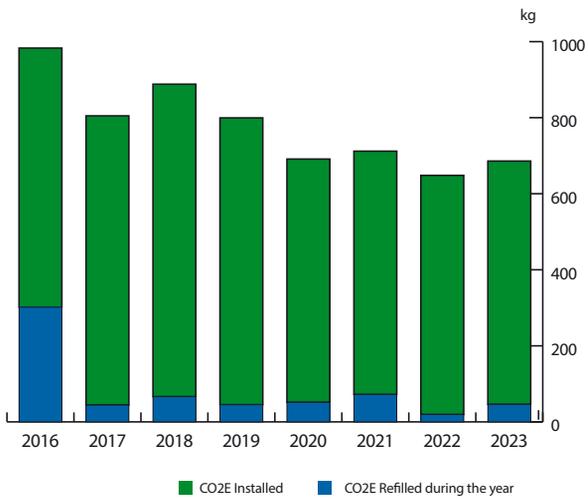
### Energy

to equipment in the production

### Chemical products

to create the special properties of the paper and keep it clean in the process

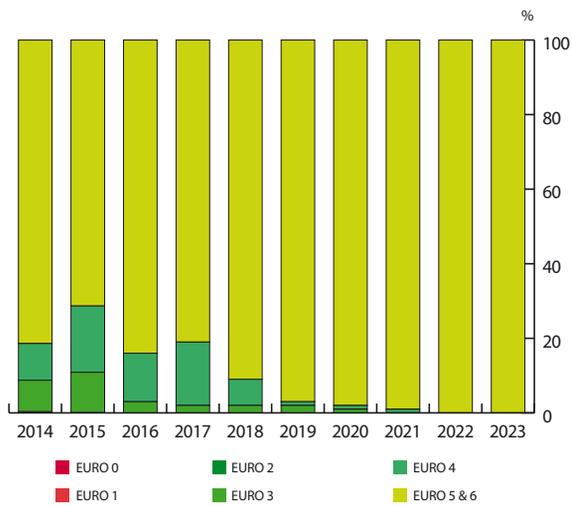
# environmental impact



## Coolants

At Munkedals we have one type of coolants "F-gases", the HFCs (halogenated hydrofluorocarbons) do not affect the ozone layer but do have quite a large impact on the greenhouse effect. Coolants in the graph are reported as CO<sub>2</sub>E. CO<sub>2</sub>E are a measure of greenhouse gases which consider that different coolants have different effects on the greenhouse effect and global warming.

The diagram on the left illustrates the amount of installed coolants (as CO<sub>2</sub>E) since 2016.



## Transport operations

Transport operations cause noise, emissions to air and the consumption of fossil fuels. The environmental impact of transport operations is therefore one of the considerations when we decide which transport carrier to use.

Truck engines are divided into various EURO classes, in which a higher figure represents engines with lower emissions, especially of nitrogen oxides and carbon monoxide. Transport operations is based on transported tonnes.



# core indicators

## Annual progress

In 2023, production decreased from 145 310 ton to 105 423 ton. The reduction in production is a consequence of several intrinsically unrelated external factors.

Despite the reduction in net production, the core indicators of material efficiency, energy efficiency and water use have managed to maintain a stable level compared to previous years when net production was higher.

Internal use of LPG and heating oil has been completely phased out since a few years now.

In the diagrams for the core indicators Nitrogen oxide and Carbon dioxide, the emissions from the purchased steam

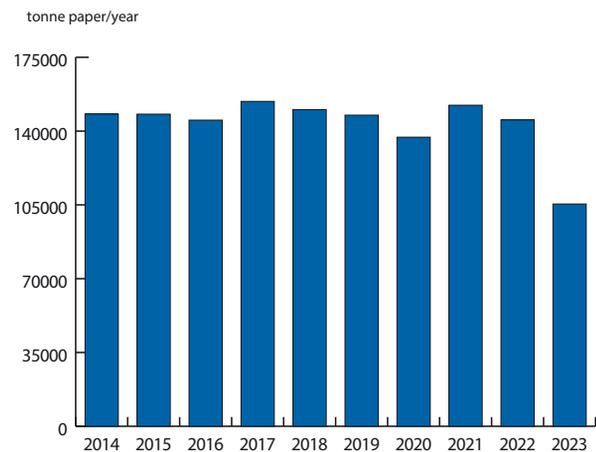
are also reported as they are directly linked to paper production.

The ongoing collaborative project with the external company ADVEN aims to secure the company's energy needs and will eventually reduce the company's fossil carbon dioxide footprint and reduce the load on the national electricity grid. The ability of our external energy partner to produce steam using the solid fuel boiler has been used to full capacity for most of 2023. Operational optimization and further work regarding the fuel for steam production is ongoing.

## Net production

The relation to net production of paper is an important aspect when describing the progress of the company's environmental performance.

The net production shown in the trend diagram is used to calculate the efficiency of the operational activity with respect to the core indicators.

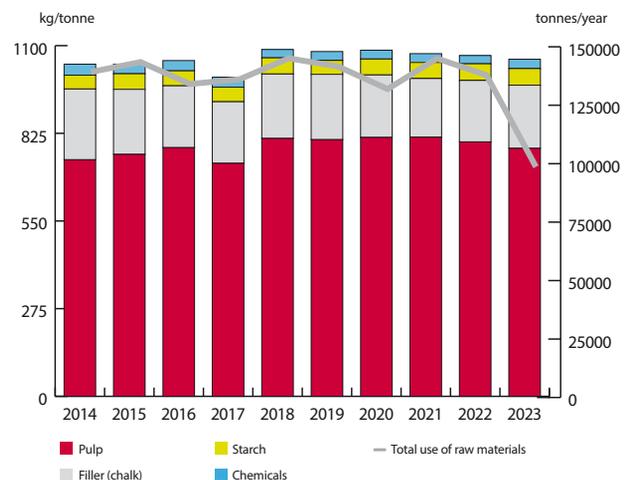


## Material efficiency

The main raw materials used in paper production are pulp, pigment, starch and auxiliary chemicals. The diagram on the right shows the material balance between raw material and finished product, excluding water.

Raw materials are transported to the mill by sea, road and rail.

For key figures for Raw materials, see page 8.

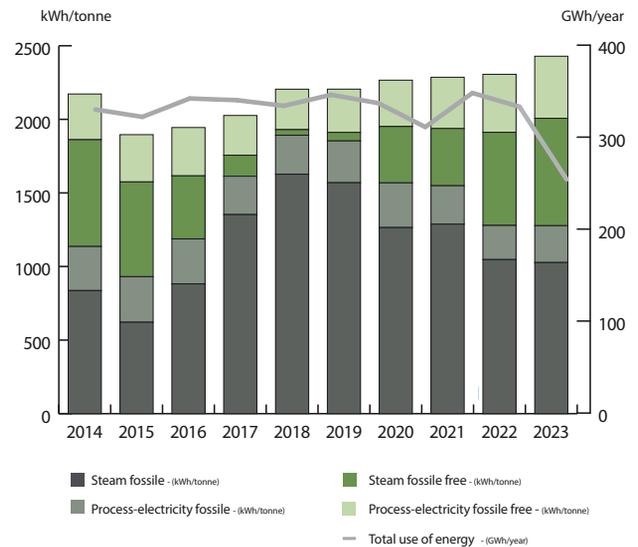


# core indicators

## Energy efficiency

The most energy-intensive processes in the production of paper are the production of steam and the operation of the paper machine's engines, grinders and pumps. The steam is distributed from internal steam boiler (based on LNG or Electricity) or from external solid fuel boiler (purchased steam) to sealed cylinders where the paper is dried. The diagram shows the total energy consumption and the distribution between different types of energy carriers.

For key figures for Energy consumption, see page 8.

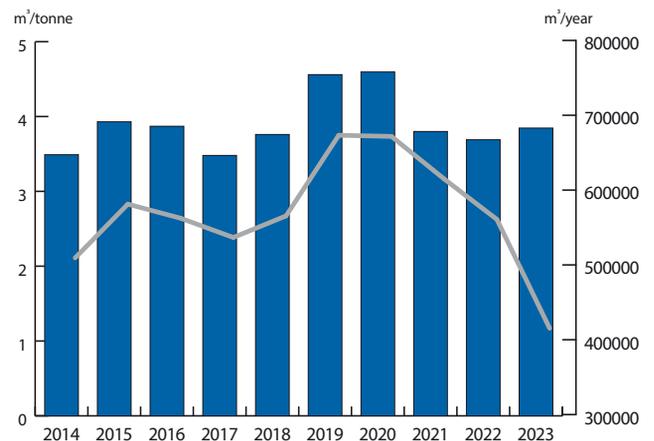


## Water use

When manufacturing paper, water is used to slush the pulp into fibre stock and to transport the fibres to the paper machine's headbox. In the paper machine, the stock is dewatered when the paper is formed. Most of the water is utilised and recirculated in the mill. Water that is not recirculated goes to the mill's water purification plant.

The amount of water used is measured as the water leaving the mill after having passed through the water purification plant.

In 2023. Despite a lower net production than before, water use has remained at a maintained low level.

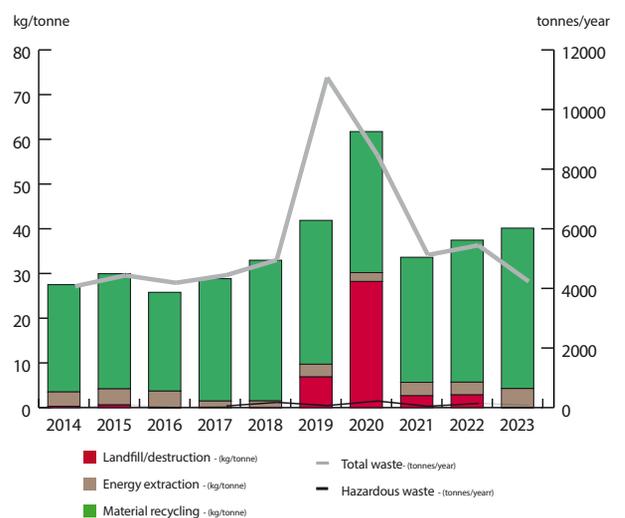


## Waste

The diagram shows the company's amount of waste in relation to production. Whenever possible, the waste is recycled. Waste that is not suitable for recycling is used for energy recovery or landfill/sent to a treatment plant for destruction.

In 2019, land preparation began for the construction of ADVENS solid fuel boiler, the work continued in 2020.

For key figures for Waste, see page 8.

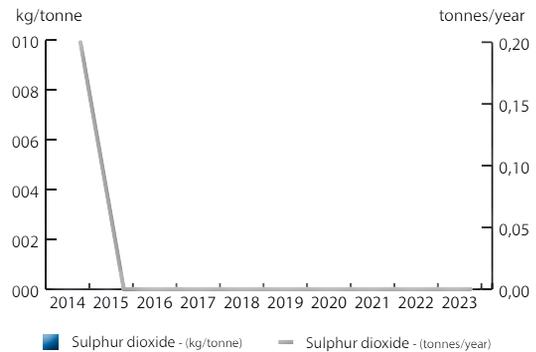


# core indicators

## emissions to air

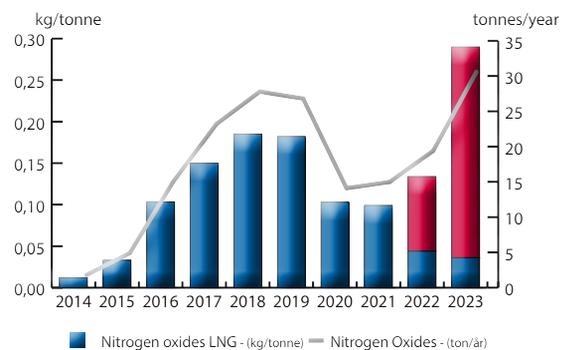
### Sulphur dioxide (SO<sub>2</sub>)

Sulphur dioxide is formed during the burning of fuel containing sulphur, e.g. oil and coal. Sulphur dioxide contributes to the acidification of land and water. As no oil or coal is burned in steam production, sulfur emissions are close to zero.



### Nitric oxides (NO<sub>x</sub>)

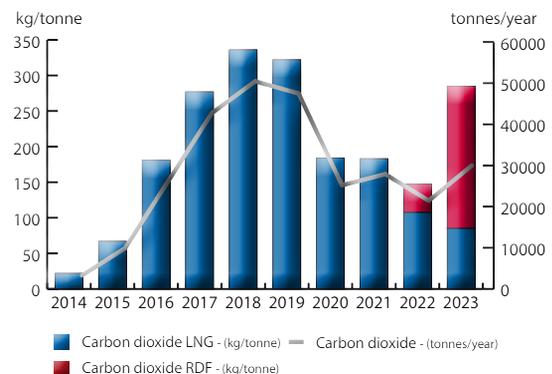
An umbrella term for the nitric oxides formed during combustion and which can contribute to the acidification of land and water. During 2023, the increase in nitrogen oxides continued, the increase depends on the combustion of RDF fuel. ADVEN reports their emission and is the owner of it (red). However, the emissions from the solid fuel boiler are linked to paper production and therefore nitrogen oxides are reported in the adjacent trend diagram. Blue is Arctic paper Munkedals, Red is ADVEN.



### Carbon dioxide (CO<sub>2</sub>) fossil

Carbon dioxide is formed when carbon compounds are completely burned in oxygen (combustion). Fossil fuels have been made by subjecting organic compounds such as plants and animals to high pressure, high temperature during a very long time. When fossil fuels are burned the carbon dioxide content in the atmosphere increases rapidly. This because the carbon that is added to the atmosphere from Fossil fuels was until previously outside the carbon cycle due to its encapsulation in the earth's crust. The increased carbon dioxide content in the atmosphere is a cause of global warming.

The CO<sub>2</sub> figure in the diagram derives from the combustion of LNG in the internal steam boiler (blue) and from external solid fuel boiler (red).

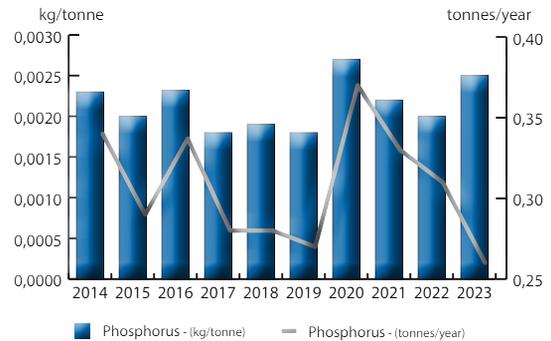


# core indicators

## emissions to water

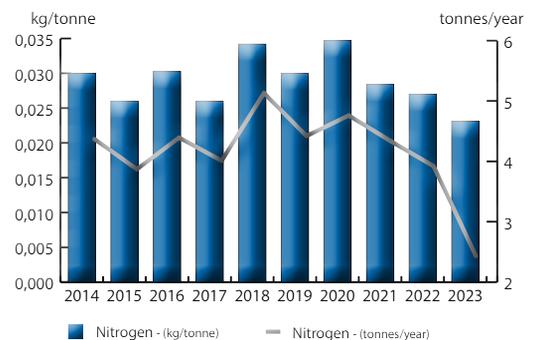
### Phosphorus (P)

Phosphorus is an element. High levels of phosphorus compounds can, together with nitrogen compounds and organic substances, result in heightened organic activity in water, which, in turn, can result in watercourses becoming overgrown.



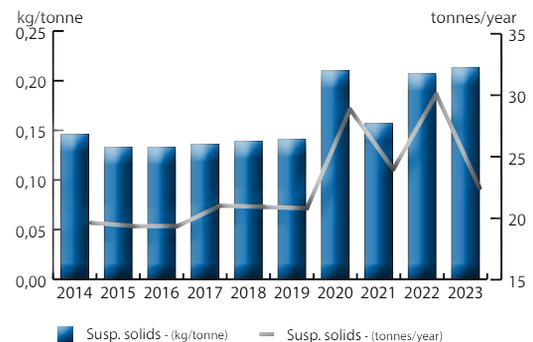
### Nitrogen (N)

An element that exists in large amounts in the atmosphere. High levels of nitrogen compounds can, together with phosphorus compounds and organic substances, result in heightened organic activity in water, which, in turn, can result in watercourses becoming overgrown. The figure shows a positive decreasing trend for the fourth year in a row.



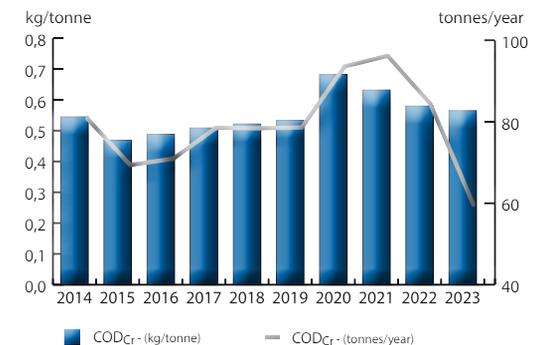
### Suspended Solids (SS)

Fiber fragments and other solid substances (e.g. chalk) in wastewater are called suspended solids and cause oxygen consumption and shallowing where the discharge takes place. Still slightly elevated peaks of suspending substances which are otherwise not seen during a normal year. Uneven production conditions are believed to have contributed to this increase.



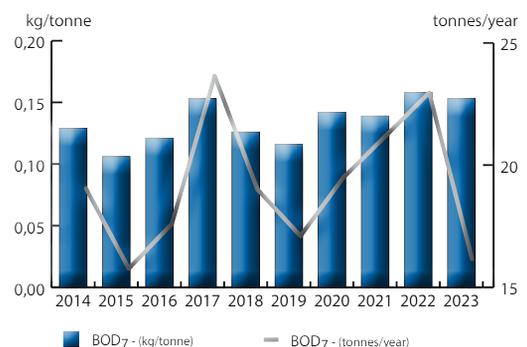
### COD<sub>Cr</sub>

Chemical Oxygen Demand – a measurement of the amount of organic compounds in water. It is mainly the organic content that consumes oxygen during decomposition. This emission did also decrease for the fourth year in a row.



### BOD<sub>7</sub>

Biological Oxygen Demand – a measurement of the amount of oxygen consumed by microorganisms during the decomposition of organic substances in water over a period of seven days.



# environmental targets 2023

Overall Environmental targets	Detailed target	Action plan	Result/Status
Reduce risk for environmental accidents	Prevent risk of emissions from PM5	Rebuild a tank to an intermediate pulp mix storage.	The tank is in place and the risk for environmental accidents has been reduced. Goal accomplished.
Reduce emissions to water	Create a more even raw water purification and smoother reject to the river	Installation of new purification equipment for incoming water	Action must be reconsidered and pending court requirements. Pipe to water tank needs to be replaced. Goal extended to 2024-12-31.
Biodiversity	Improve opportunities for migrating fish in the Munkedals river	Investigate opportunities for habitat improvements in the Munkedal river	Actions completed and spawning grounds for fish prepared. Goal achieved.
Reduced freshwater use	As an annual average, 20% of the discharge water must be returned to the process	Install appropriate filters	Current reversal 2023-09-19 measured to 17,5%. Water consumption from the solid fuel boiler higher than estimated. Goal not achieved, extended to 2024.
Reduce the proportion of fossil fuels	80% reduction in energy of fossil origin compared to 2017	Installation of new solid fuel boiler that replaces LNG	Operational problems in the solid fuel boiler are related to the nature of the fuel. The goal is therefore extended to 2023-12-31 and reformulated to a 50% reduction in fuel fossil origin in steam production compared to 2017. 50% fossil fuel reduction was successful. Goal achieved.
Reduced energy use	Reduce the energy use 2,5% compared with 2019	Reduce broke share, Improved runability PM, Fewer interruptions and unplanned stops.	Goal not achieved due to the marked based product mix. Goal extended to 2024.
Reduce the amount of waste	Concentrate the bio sludge by drying.	Investigate the possibility of using waste heat for this purpose	The goal has changed direction. The target's original action plan, drying bio sludge with waste heat, was not to satisfaction. A collaboration with an external waste management company has been initiated to investigate the possibility of concentration, processing and then co-incineration of the bio sludge in the solid fuel boiler. Co-combustion tests will be carried out. Goal extended to 2024.
Reduce the use of packaging	Reduce plastic use by 25%. Roll pack and packaging use by 8% in pallet pack.	Change to a thinner packaging material	From the turn of the year, the wrapping paper for rolls has reduced the proportion of plastic by 25% and the plastic in the wrapper for reams has been removed. The goal for pallet wrapping has already been achieved since previous years. Goal achieved.

# environmental targets 2024

Overall Environmental targets	Detailed target	Action plan	Result/Status
Reduce emissions to water	Smoother raw water treatment and reject to the river.	Installation of new equipment for purification of raw water.	Action must be reconsidered. Pipe to water tank needs to be replaced. Target extended to 2024-12-31.
Biodiversity	Flower meadow in the immediate area for pollinating insects.	Establishment of a flower meadow in a suitable place.	Land preparation carried out and sowing is expected to take place during spring 2024.
Reduced freshwater use	As an annual average, 20% of the discharge water must be returned to the process	Reassign stagnant ultra filtration plant to treat parts of today's outgoing water.	Ultra filtration plant is planned for commissioning in December 2024.
Reduce material waste	Concentrate the biosludge by drying	Investigate the possibility of using waste heat for drying bio sludge and carry out co-combustion tests of the bio sludge in the solid fuel boiler.	Co-combustion test performed, unsatisfactory results. The goal takes once more a new direction. A collaboration with an external company that manufactures construction soil initiates. The bio sludge provides environmental benefits through reuse. Goal achieved.
Reduce the proportion of fossil fuels	Maximum 50% fossil origin in the steam production comparison in 2017.	Optimize the operating criteria for the solid fuel boiler.	The ash output and some other limitations shall be reconstructed. 100% operation on the solid fuel boiler.
Reduced energy use	Reduce the energy use 2,5% compared with 2019.	Reduce broke share, improved operability PM. Fewer interruptions and unplanned stops. Use enzyme and indirectly produce a more easily dried paper.	Malfuctions shall be fixed and enzyme works well.

# auditor's statement

RISE is a SWEDAC accredited environmental verifier which has reviewed Arctic Paper Munkedal AB and found that the company has an EMS that meets the requirements of the EMAS regulation (no 1221/2009). RISE Certification also examined this report and found it to be accurate and sufficiently detailed to satisfy the requirements of EMAS.

Munkedal, 2024-06-19



Anders Eriksson / RISE Certifiering



VERIFIED  
ENVIRONMENTAL MANAGEMENT  
S-000248

## How to order environmental reports

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Arctic Paper Munkedals environmental report is available in Swedish and in English, on the web and in printed matter.

Next environmental report is available in spring 2025.

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# glossary

## ACCREDITED COMPANY

A company that has been approved by a supervisory authority for example to conduct special analyses and checks on industrial processes.

## BIOLOGICAL TREATMENT

Decomposition of pollutants in water with the aid of microorganisms.

## BLEACHING

A method of increasing for example the pulp's brightness. Bleaching is undertaken using chemical compounds without elementally bound chlorine, ECF, or without any chlorine compounds, TCF.

## BOD<sub>7</sub>

Biological Oxygen Demand. The amount of oxygen required for natural decomposition of wastewater. 7 means that the natural decomposition has been going on for seven days, for the analysis. BOD is low in relation to COD if remaining substances are hard to decompose and the biological treatment is functioning well. High values involve an increased risk of a lack of oxygen in the container.

## CARBON DIOXIDE, CO<sub>2</sub>

A naturally occurring gas that is formed by biological decomposition and combustion of organic materials.

## CHEMICAL PRECIPITATION

Chemical bonding of pollutants which makes it possible to separate the pollutants from the waste water through sedimentation.

## CHEMICAL PULP

A joint term for SULPHATE PULP and SULPHITE PULP, which are manufactured by chemically detaching the wood's fibres from one another.

## COD<sub>Cr</sub>

Chemical Oxygen Demand. The amount of oxygen required for chemical decomposition of remaining pollutants in for example wastewater. Cr means that chromate has been used as oxidation agent for the analysis. High values may involve an increased risk of a lack of oxygen in the recipient.

## dB(A)

Decibel A, a measure of the amount of sound measured with a filter that takes account of the human ear's sensitivity to various sound frequencies.

## EMAS

Eco-Management and Audit Scheme. A voluntary EU decree and requirement document for an environmental management system. EMAS requires, in addition to the fact that ISO 14001 or equivalent is fulfilled, that an official environmental report is compiled. The environmental report is examined and approved by an accredited environmental audit company.

## EUTROPHICATION

PHOSPHORUS, P, and NITROGEN, N, are elements included in nutrient salts that increase the growth of plankton in water. If the content of the nutrient salts is too high, such growth can be so strong that the oxygen is used up and a shortage of oxygen arises.

## FINE PAPER

A generic term for graphic paper, writing paper and printing paper, and certain special types of paper.

## FSC® CERTIFIED RAW MATERIAL

Raw material with guaranteed origin (Forest Stewardship Council) which exclude wood produced in conflict with FSC's 5 paragraphs (illegal lumbering, key biotopes, serious social conflicts, genetically modified wood or unsustainable forestry).

## GUIDELINE VALUE

A guideline value is a value that, if exceeded, places an obligation on the permit holder to take action to ensure that the value can be met.

## HAZARDOUS WASTE

Waste containing pollutants that are directly hazardous to the environment, such as certain chemicals, waste oils, batteries, fluorescent tubes, mercury lamps and electronic scrap.

## ISO 14001

An international standard containing specific requirements for an environmental management system. A certificate remains valid for three years on the condition that there is compliance with the certification requirements and the annual audits are conducted and produce a successful result.

## LIMIT

A value for discharges from industrial operations that has been set by the environmental authorities and that may not be exceeded.

## MECHANICAL PULP

A joint term for pulp which is manufactured by mechanically detaching the wood's fibres from one another.

## NITROGEN OXIDES, NO<sub>x</sub>

Gas formed when the nitrogen in combustion air is oxidised at a high combustion temperature. Contributes to acidification and eutrophication.

## OXYGEN-CONSUMING SUBSTANCES

Substances that consume oxygen when broken down. Measured as COD and BOD.

## RECIPIENT

A receiving entity for discharges, such as the sea, a lake, a water-course or the atmosphere.

## SULPHUR DIOXIDE, SO<sub>2</sub>

Formed by the combustion of sulphurous fuels such as gas, coal, oil and oil products. Discharges contribute to the acidification of land and lakes.

## SUSPENDED SOLIDS, SS

The volume of solid matter in water that remains in a filter with a mesh of a defined size.

## UNCOATED PAPER

Paper which has been coated with a thin layer of starch, in contrast to COATED PAPER which is coated with a layer consisting of elements including among others clay, chalk, starch and synthetic binding agents.



## ARCTIC PAPER

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