

# Sustainability REPORT

2014



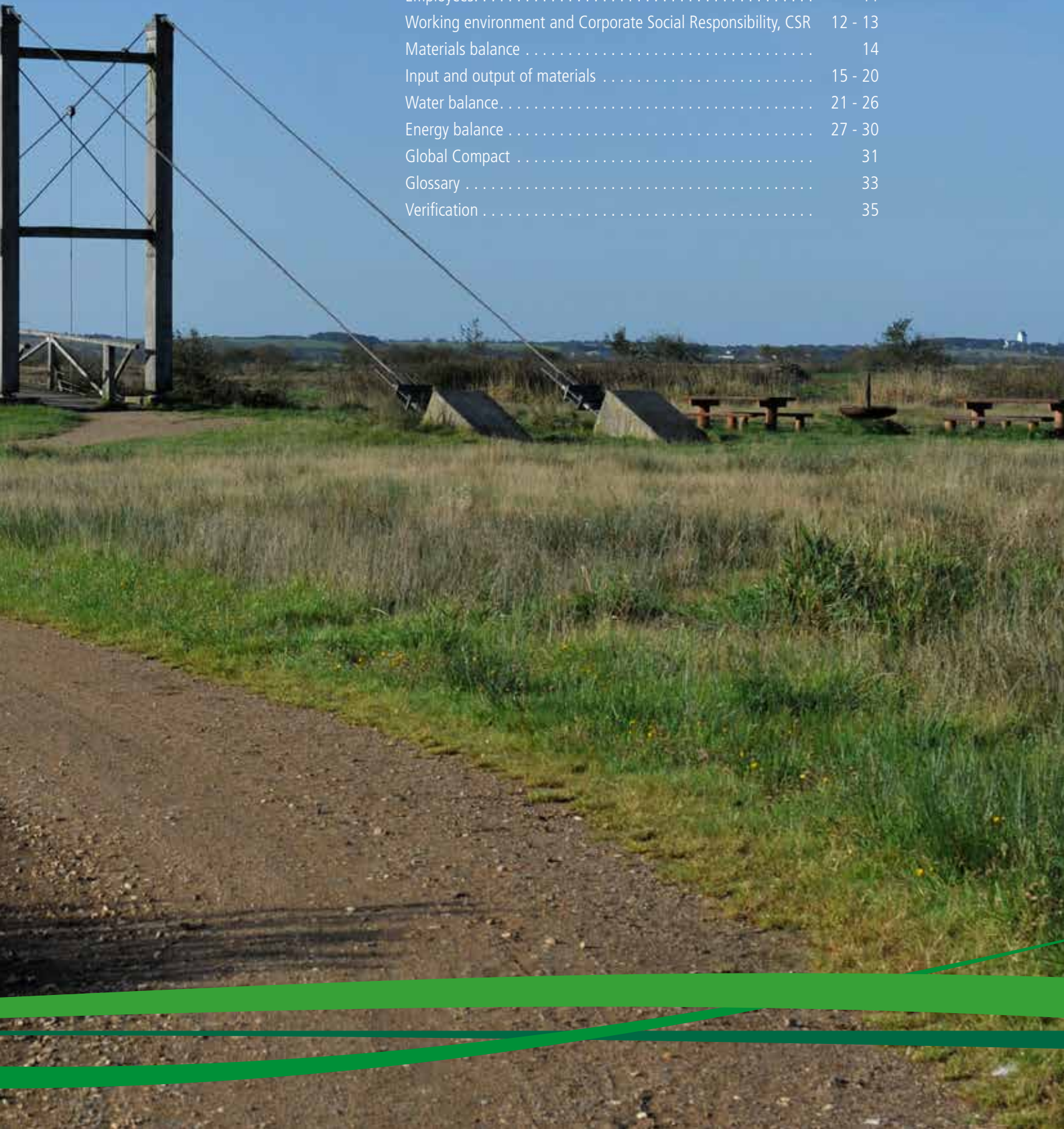
SKJERN  
PAPIRFABRIK





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# Facts about the mill

## **Production site**

Skjern Papirfabrik A/S

## **Location**

Birkvej 14, DK-6900 Skjern

## **Environmental approval**

Skjern Papirfabrik's latest review of the environmental approval is from 2000. The environmental approval is under review.

## **Supervising Authority**

The Danish Environmental Protection Agency Aarhus  
The Municipality of Ringkøbing-Skjern

## **Industry/NACE code**

21.12 – Production of paper and paperboard

17.12 – Production of paper pulp

## **Accredited verification**

DNV GL - Business Assurance AS,  
verification No. DK-V-6001

The verification does not include issues concerning working environment.

## **Environmental legislation**

Environmental Protection Act  
Danish Statutory Order on Waste  
Chemical Substances and Products Act  
REACH  
Various authorisations and others

## **Period covered**

1/1-2014 to 31/12-2014

## **Date of issue**

April 1, 2015

## **Next sustainability report**

Early April, 2016

## **General information on the production site**

The mill's land register is classified as an industrial area, which on all sides borders on residential areas and housing districts. Therefore, the environmental approval includes a number of noise requirements to prevent unnecessary inconvenience for the mill's neighbours.

Skjern Papirfabrik A/S is located in surroundings of scenic beauty close to the Skjern River.

## **Changes at the production site**

The mill's wastewater treatment plant was closed in the summer of 2014. Wastewater from the plant is now led to the wastewater treatment plant of Ringkøbing Skjern Forsyning in Tarm. In June the use of river water as process water was replaced by raw water supplied by Ringkøbing Skjern Forsyning.





# Preface

## **Skjern Papirfabrik supports the UN Global Compact**

*Since 2013 Skjern Papirfabrik has been a member of the UN Global Compact, which is a global initiative to promote sound business and ethical practice. For Skjern Papirfabrik the membership of the UN Global Compact has been a natural extension of our activities as a responsible company. As a member we obliged ourselves to incorporate the UN Global Compact 10 basic principles in our company and to communicate them to our customers, suppliers and other business partners. This report describes how Skjern Papirfabrik performed in the individual fields.*

Another 365 days passed and are now behind us. A year where we were both nationally and globally challenged financially and politically. A year where - to a greater or lesser extent - demands were placed on us to have to face flexibility and operative changes.

When in the overall perspective I have to present an estimate of Skjern Papirfabrik's performance in the past year it must be a generally approved result created by an ability and readiness to adapt to the markets.

Beyond the natural "on-going" focusing on improvement of the mill's core areas on the market, we have also in 2014 prioritised goal-oriented focus areas throughout the year, primarily focused on an improvement of the large water flow in and out from the factory of the paper process.

The major environmental change of the water flow is the conversion from treatment of process wastewater on our own existing wastewater treatment plant to treatment at a municipal plant. The agreement was made after investigations had been made revealing a very positive contribution of substances to the municipal plant, when the wastewater from Skjern Papirfabrik was led to the local municipal plant. Furthermore, the local municipal plant had an unutilised purification capacity, which improved the operating economy for both parties.

The mill has since its start in 1965 used water from the Skjern River as process water for production of the different paper qualities. Deviations as to different substances and temperatures of the river water have over the years given the factory challenges as to production capacity.



The homogeneity and stability of the process water do play an important part for the manufacturing possibilities. Therefore, in the 2nd half of 2014 the mill made an agreement with the local utility company as to the supply of raw water from one of their drillings in the area.

Another milestone in the mill's history is a change of the energy consumption to production of process steam for the drying process. After several years of investigation we decided to install a wood chips fired boiler plant in replacement of the existing N-gas fired boiler. The new plant which is expected to come into operation during the 4th quarter of 2015 is both to secure the increasing steam needs in the future, and a considerable improvement of the CO<sub>2</sub> emission, which is expected to be reduced by more than 14,000 tonnes per year.

In 2014 Skjern Papirfabrik via recycled waste heat supplied 60 % of the heat requirement in Skjern city. With a consequently smaller heat production at the district heating plant this is equal to a reduction of CO<sub>2</sub> emission of 8,200 tonnes for Skjern city.

Further to the intense search for environmental improvements, for both the internal and the external environment the mill can enjoy the reductions of both water consumption and discharge and the specific energy consumption per gross tonne.

Jørgen Thomsen  
CEO

# About Skjern Papirfabrik

Skjern Papirfabrik is situated in the western part of Denmark in beautiful natural surroundings close to the Skjern River.

Skjern Papirfabrik is the only paper mill left in Denmark and thus an important player when it comes to the use of recycled paper.

The production is mainly cardboard, paperboard and paper, which are delivered for further processing at our customers. More than 90 % of the production is exported to countries in Europe, while the remaining part is delivered to our Danish customers.

Skjern Papirfabrik is an order producing mill. All products are made in a close cooperation with the customers, and we are constantly working on optimisation and further development. The individual products are based on the individual customer needs.

## Owners

Skjern Papirfabrik has since 2005 been owned by S.P. Holding, Skjern A/S, which is again owned by Buur Invest and three of the employees from the factory management.

## Management

Chairman of the board	Charlotte Buur
CEO	Jørgen M. Thomsen
CFO	John T. Nybo
Logistics manager	Hans Hesselund
Sales manager	Niels-Erik Rasmussen

## Paper machine

Type	Fourdrinier
Machine width	294 cm
Grammage area	90 – 475 g/m <sup>2</sup>

Being a relatively small producer in the market, Skjern Papirfabrik's strength is to be a good business partner, to supply quality products and to show great flexibility in the choice of product types and consistency of supply.

Only recycled paper is used in the production, which operates around the clock, approx. 350 days a year. The raw material primarily comes from Danish, Norwegian and German suppliers.

Beyond the four main products: Core board, bookbinder's board, grey board and sheets a number of special products are produced with custom requirements for the physical properties of the paper board.

It is possible to manufacture products with a grammage between 90 and 450 g/m<sup>2</sup>. The max. width of the end product is 290 cm.

As from 2013 it is possible to have FSC-certified products from Skjern Papirfabrik A/S.



The mark of  
responsible forestry

Photo: Products

# Strategy for selected parameters

	Status 2013	Status 2014	Goal 2015	Value to Skjern Papirfabrik and to the society
Increased paper production	59,927 net tonnes	63,077 net tonnes	63,776 net tonnes	Improved financial basis, which is a force to further development of the mill. Increased paper production has also a positive impact on other environmental parameters.
Less specific energy consumption	1,350.8 kWh/gross tonnes	1,318.3 kWh/gross tonnes	1,290 kWh/gross tonnes	Better economy and less CO <sub>2</sub> emission per tonne.
Increased production of district heating	37,600 MWh	40,079 MWh	43,000 MWh	Increased district heating production will reduce the consumption of fuels at Skjern Fjernvarme and stabilize the district heating price for the citizens in Skjern.
CO <sub>2</sub> saving in consequence of district heating production	7,700 tons	8,200 tons	8,800 tons	Total CO <sub>2</sub> emission is considerably reduced by substituting ordinary district heating production with district heating based on waste heat.
Increased part of biomass as fuel	0%	0%	15%	Substitution of natural gas for biomass gives a considerably lower CO <sub>2</sub> emission.
Improved specific wastewater treatment	0.61 kg COD/tonnes DM paper	0.43 kg COD/tonnes DM paper	Goal left out, as wastewater has been transferred to municipal purification	Improved wastewater treatment is positive for the water environment.
Less wastewater	364,887 m <sup>3</sup>	330,259 m <sup>3</sup>	320,259 m <sup>3</sup>	By recycling as large water amounts as possible the total wastewater amount will be reduced. This means a lower strain on Tarm wastewater treatment plant and fewer expenses.
Less water intake	436,676 m <sup>3</sup>	374,515 m <sup>3</sup>	364,515 m <sup>3</sup>	Reducing the water intake means less strain on the water resources and also an economic gain.
Improved working environment	0 accidents	3 accidents	0 accidents Survey of the possibility of OHSAS 18001 certification	Better and safer working environment for the employees.



# Environmental impacts

In connection with paper production there are several environmental impacts, which can be divided into direct and indirect ones, respectively. The direct impacts arise as a direct result of the production.

Skjern Papirfabrik A/S is constantly working to limit these as much as possible.

The indirect environmental impacts are not directly affected by the production, but primarily consist of the transportation of raw materials and end products and environmental impacts caused by the collection of waste paper, the production of auxiliary materials and the disposal of products at the end user.

The most significant environmental impacts have been evaluated on the basis of permits, legislation, and the largest possible potential impacts on the external and the local environments.

For Skjern Papirfabrik the most significant environmental impacts are energy consumption, consumption of auxiliary materials, water consumption, discharge of purified wastewater and reject handling.

As a positive environmental impact the total CO<sub>2</sub>-emissions of Skjern City are reduced by approx. 8,200 tonnes a year in connection with the heating of Skjern City by district heating produced on the basis of waste heat from the paper production.

In 2014 district heating from Skjern Papirfabrik supplied the Skjern City with approx. 60 % of the consumption. This quantity is expected to increase even more in 2015 and the years to come.

In 2014 the establishment of a wood chips fired boiler plant started. On the long term it will replace the total natural gas consumption used for steam production. This is an important step to reduce the environmental impact in connection with paper production.

In the company's environmental survey it has been estimated not relevant to perform an assessment of biodiversity.

## Follow-up

There is an ongoing control of the consumption and emissions for significant environmental impacts.

In the management system there are procedures describing which registrations must as a minimum be made for each individual environmental impact.

*Photo: Mood picture from Skjern River*



# Other environmental activities

For the last 20 years Skjern Papirfabrik has had defined principles and guidelines for the mill's environmental work in the form of an environmental policy.

## Environmental policy

In accordance with business and management objectives and approach Skjern Papirfabrik will strive to minimise the impact on the surrounding environment as much as possible. This is achieved by using raw materials and energy in the best possible way, and by reducing emissions produced from the mill's processes.

Skjern Papirfabrik wants to reduce environmental impact by:

- Open communication about the environmental impacts related to the company's processes and products
- Making sure that employees act in an environmentally responsible way, and comply with internal and external rules
- Positive cooperation with supervisory authorities
- Encouraging our suppliers to provide environmentally friendly raw materials, products and services
- Complying with relevant legislation and other requirements that the company has endorsed

- Ongoing environmental improvements, regardless of the fact that the regulatory requirements have already been met
- Environmental assessment of new projects
- Encouraging employees to participate in preventive environmental work
- Making sure that external craftsmen and contractors are aware of and comply with the company's environmental directions
- Ensuring that the buyers of the company's products are informed of environmental considerations in connection with the manufacture, use and disposal of the company's products.

The company will publish its environmental policy in this annual Sustainability Report, which can be found on Skjern Papirfabrik's home page.



*Photo: Recycling waste paper*

# Other environmental activities (continued)

## The environmental management system

The environmental management system of Skjern Papirfabrik A/S has been compiled to cover the following standards: ISO 14001 (environment), EMAS (environment), ISO 50001 (energy management), ISO 9001 (quality), OHSAS 18001 (working environment) and FSC.

The environmental management system is developed in the electronic system Sherlock Web, which is an internet based document management system.

In addition to the electronic system printed management manuals have been placed at relevant spots everywhere in the company, in order to facilitate access to the policies and procedures.

The environmental management system is checked by internal audits, as well as an annual external audit. Skjern Papirfabrik A/S has an internal audit group consisting of six employees. Four of the members of the group are exchanged every year, so that the mill workers will learn as much about the management system as possible. Internal auditors' reports are presented to and approved by the management, before disclosed at the mill.

## Other environmental initiatives

During 2013 a replacement of gas and diesel-powered trucks with electric trucks was made. In connection with an extension of the warehouse in 2014 the internal transportation of finished goods has been reduced, and a larger part of the transportation is now indoors, altogether reducing the total external noise impact. During 2014 the projecting of a large wood chips fired boiler plant in replacement of the existing gas-fired boiler took shape, and contracts have been signed with suppliers, and the construction work is in progress.

Skjern Papirfabrik cooperated with the environmental protection agency in 2014 to disseminate knowledge of the BREF-cooperation. This resulted in a short film, which can be seen on the Danish environmental protection agency's home page. Skjern Papirfabrik regards the cooperation as to handing in data for BREF for the pulp and paper industry as most important, as the new BAT conclusions will become mandatory at short notice after introduction of the IE Directive. Therefore, Skjern chose to join the process actively, and also recommends other industries to do the same.

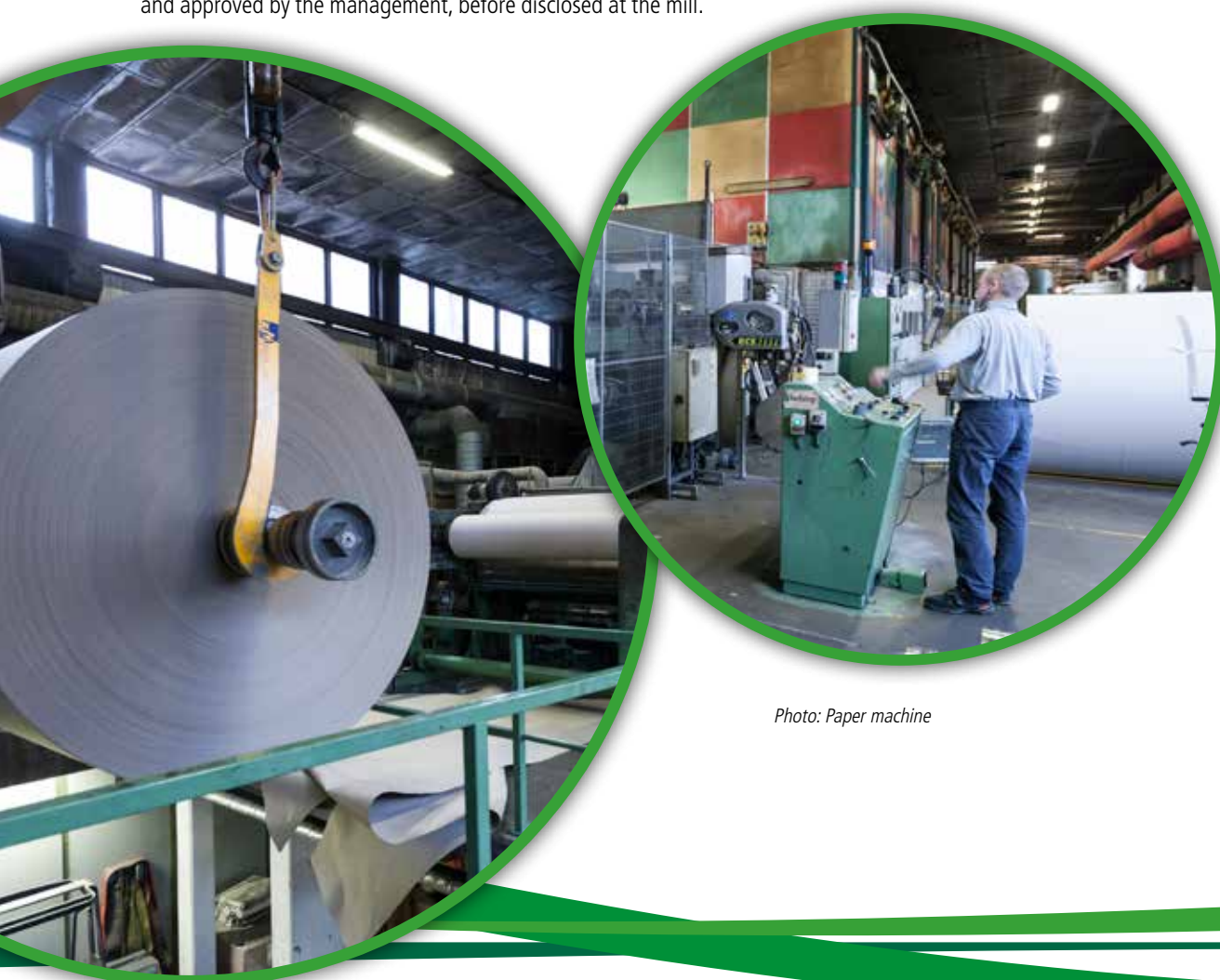


Photo: Paper machine



# Employees



	2010	2011	2012	2013	2014
<b>Average number of employees:</b>	68	69	68	71	73
Men (%)	90	90	90	89	90
Women (%)	10	10	10	11	10
<b>Average age of the employees (years)</b>	49	49	49	49	50
<b>Seniority</b>					
0-3 years employment in %	18	17	16	18	22
4-6 years employment in %	10	10	13	13	8
More than 6 years employment in %	72	73	71	69	70
Average seniority (years)	15.3	15.2	14.8	14.4	14.8
Employee turnover in %	1.5	7.0	4.4	5.6	6.8

*Seniority table*

## Development of the composition of employees

The mill has 73 employees with the following composition:

- 4 skilled metalworkers
- 2 automation mechanics
- 52 blue-collar workers
- 15 white-collar workers

At Skjern Papirfabrik there is a natural replacement of employees who retire or take advantage of early retirement benefits. By the end of 2014 17.8 % of the employees are over 60. For white-collar workers 33.3 % of the employees are over 60. The number is increasing, and will also in the years to come give a natural replacement of employees. In spite of this the yearly replacement in 2014 is only 6.8 % of the workforce.

Employees of other nationalities constitute 9.6 % of the labour force today. The number is increasing and completely in line with our CSR policy.

The gender distribution has been very constant during recent years. This is due to the fact that there are currently no women employed in production, only in the administrative and cleaning departments. Both men and women may apply for vacancies in production, but for many years no qualified female applicants were to be found. Whether this is due to work shifts or the type of work is unknown.

Skjern Papirfabrik sees it as a natural part of our activities to treat employees with respect and dignity and thus avoid discrimination. This is a natural thing for a Danish company, and we consider it a contributing factor to our staff's high seniority and thus many employees with 25th anniversary. In 2014 27.4 % of the present staff had been employed for more than 25 years.



*Photo: Rewinder*

# Working environment and

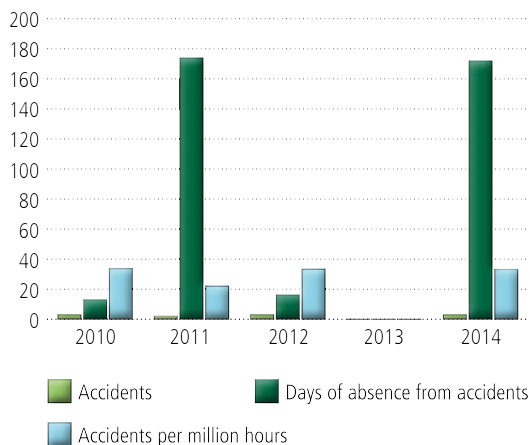
## Working environment

The health and safety of the employees is primarily safeguarded by the management and the working environment organisation, consisting of 6 working environment representatives, 3 foremen and the working environment manager.

All members attend compulsory working environment training, when entering the committee, and all members of the working environment organisation are involved in the daily working environment activities.

In 2014 3 work accidents were registered that required more than one day's absence. On a monitor number of days since latest accident is followed.

Work accidents



In 2014 the most important steps as to working environment were the establishment of a fixed gangway in the 3rd drying facility to help out when replacing the drying wire. And furthermore a large renovation of bathing and toilets facilities has been made.

Continuous improvements are made according to proposals from the workplace assessments.



## Social responsibility, CSR

For many years Skjern Papirfabrik considered it a natural part of our activities to contribute to a harmonic cooperation with the local community. This means among others that we invite local craftsmen to make an offer in connection with large projects.

We have conducted tours at the factory, and for instance educational institution and municipalities make good use of this offer, wanting to show their students / employees what happens to the recycled paper and thus help them understand how important it is to recycle this important resource.

In recent years Skjern Papirfabrik has also offered Bachelor of Technology Management and Marine Engineering students to complete their final project in cooperation with Skjern Papirfabrik. During 2014 two students made their final project at the factory. The energy manager acts as mentor for the students in such cases.

The energy manager at Skjern Papirfabrik did in 2014 disseminate knowledge of utilisation of waste heat by means of the heat pump technology. This was done by features on project days and conferences all over the country and by receiving visitors from interested companies. The technology is quite new, and as Skjern Papirfabrik is a front-runner the company sees it as part of its social responsibility to contribute to more knowledge in the field.

Furthermore, Skjern Papirfabrik donates money to a number of charity organisations, both for health and social purposes and to the local sports clubs.

Skjern Papirfabrik encourage the employees to participate in local sports arrangements. For one thing to support local activities - but also to improve the employees' health. And as a natural continuation of this the factory will pay the employees' fees.

Skjern Papirfabrik A/S prepared a CSR policy to focus even more on the mill's social responsibility.

In 2013 Skjern Papirfabrik joined the UN Global Compacts principles, and is thus obliged to show an ethically correct execution of business.



# corporate social responsibility, CSR

## CSR policy

Social responsibility is a fundamental element for us as an organisation to appear as a legitimate and responsible company within the industry.

There is an international expectation that companies include social responsibility in their activities. At Skjern Papirfabrik A/S we are convinced that it also gives us benefits in our business to focus on environmental protection, employee development, health and safety, and other aspects of social responsibility.

## Skjern Papirfabrik wants to show Corporate Social Responsibility by

- complying with existing laws in all respects
- demonstrating transparency and an accommodating attitude also in social areas
- being open for conducted tours for amongst others educational institutions, associations and other interested parties
- supporting association's work in local community
- making as much effort as possible to employ local craftsmen and contractors to do external jobs
- demonstrate zero tolerance for corruption
- demanding fair competition and fair trade with customers and suppliers

Skjern Papirfabrik's marked-related advantages are to be found in the supply of good products and services, and never in unethical and illegal sales promotion.

Skjern joined the UN Global Compact as a natural continuation of the company's activities as a legitimate and responsible company and player on the international market.

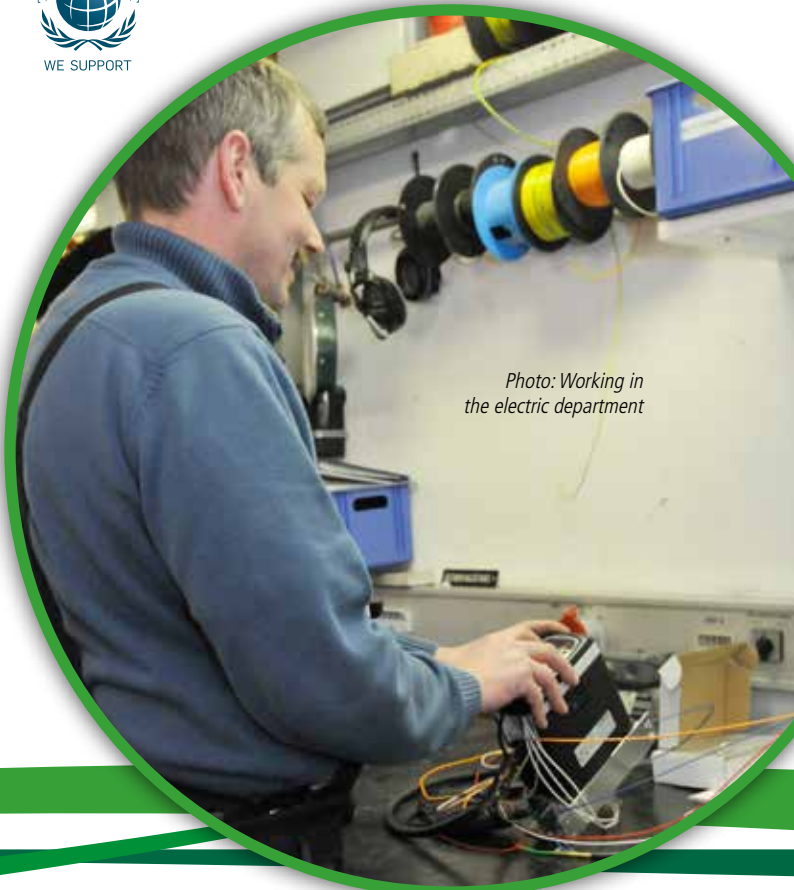
## Skjern Papirfabrik wants to comply with the 10 Global Compact basic principles by

- supporting and respecting human rights
- sustaining freedom of association and acknowledge the right to collective negotiations
- dissociating ourselves from forced labour
- dissociating ourselves from child labour
- avoiding discrimination when it comes to conditions of employment
- being environmental responsible
- opposing all kinds of corruption, such as blackmail and bribe

Skjern Papirfabrik has as a member of the UN Global Compact's Nordic network participated in exchange of experience meetings as to the preparation of COP reports, after the first COP report was prepared and sent to UN Global Compact. Among other things this resulted in the fact that from now on our sustainability report will also in future serve as COP reporting to UN Global Compact.

Skjern is an independent company with one production site in Denmark. In Denmark the respect of human rights, including the dissociation from forced and child labour is an integrated part of Danish mentality, and Skjern Papirfabrik considers this a natural part of operating on an international market. Skjern Papirfabrik complies with Danish law, supporting the above-mentioned. This is also substantiated by Transparency International's yearly report for 2014, where Denmark was again number one, being the least corrupt country in the world.

In Denmark we have many nationalities, and Skjern Papirfabrik considers it a natural part of the activities to offer people of another nationality work at the mill on equal terms as Danish citizens. Actually, 3 out of 5 newly appointed employees are in 2014 of another nationality than Danish.



*Photo: Working in the electric department*

# Materials balance

**CO<sub>2</sub> emission due to incineration  
of natural gas, auto gas and diesel**  
14,591 tonnes of CO<sub>2</sub>

**Evaporation of water**  
41,995 m<sup>3</sup>



**Recycled paper**  
64,373 tons DM

**Energy**  
96,193 MWh

**Auxiliary  
materials**  
771 tonnes

**Water**  
384,390 m<sup>3</sup>



**Finished products**  
64,069 tonnes DM

**Water**  
342,395 m<sup>3</sup>

**District heating sales**  
40,079 MWh



**Waste/reject**  
2,062 tonnes DM



# Input and output of materials



**Recycled paper**  
64,373 tonnes DM

**Finished products**  
64,069 tonnes DM

**Auxiliary materials**

- Production 679 tonnes
- Waste water treatment plant 79 tonnes
- Maintenance 13 tonnes

**Waste/reject**

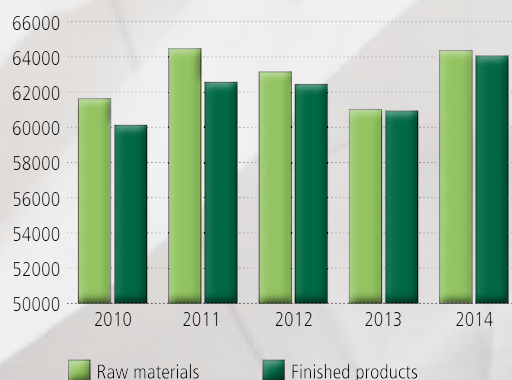
- Waste reject 330.0 tonnes DM
- Reject for soil improvement 69.0 tonnes DM
- Combustion 1,376.0 tonnes DM
- Wastewater sludge 192.0 tonnes DM
- Suspended solids 53.0 tonnes DM
- Hazardous waste 1.3 tonnes
- Metal for recycling 41.0 tonnes

## Paper raw materials

The diagram below shows the ratio between the consumption of paper raw materials and the production of finished products.

The diagram below shows the specific consumption of paper raw materials compared to the produced quantity of finished products.

**Paper tonnes of dry matter per year**



Fluctuations can be ascribed to variations in moisture content and the amount of impurities in the raw materials.

**Specific paper raw materials consumption**



The specific consumption is very constant, lying at around 1.00, which is very common when manufacturing 100 % recycled paper. Fluctuations can be ascribed to variations in the amount of impurities in the raw materials and uncertainties as to moisture content.

# Input and output of materials (continued)

## Auxiliary materials

The vast majority of the auxiliary materials is used for the production of paper, while smaller amounts are used for wastewater treatment and in the maintenance department.

The auxiliary materials for production mainly consist of adhesive, starch, and draining products. Some of the auxiliary materials are contained in the end product, while the rest is discharged through the process water to the wastewater treatment plant.

The auxiliary materials for the wastewater treatment plant primarily consist of products for draining sludge, for improving the depositing properties, and providing nutrients for the micro-organisms in the wastewater treatment plant, and for last treatment of the purified wastewater.

The auxiliary materials for maintenance consist of products used for the operation and maintenance of the production machinery, such as oil, grease and cleaning agents.

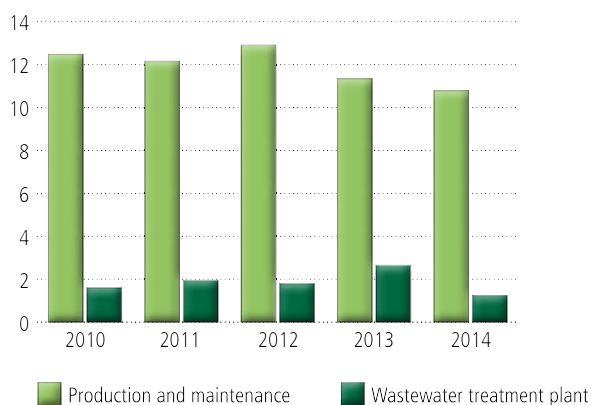
We have seen a considerable decrease in the use of auxiliary materials at the wastewater treatment plant, being a natural consequence of the plant running only for the first 7 months of the year. The goal was a reduction of 40 %. A decrease of 50 % has been realised, which means the goal has been achieved.

## A, B and C substances

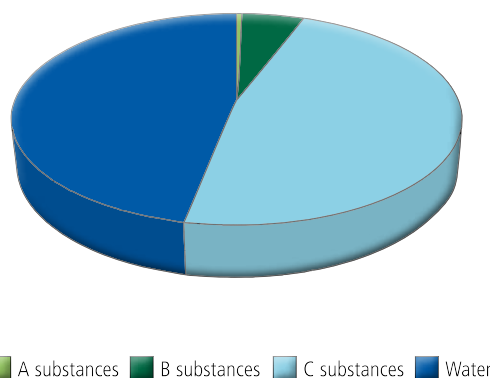
The guidelines on environmentally harmful substances in industrial wastewater from the Danish Environmental Protection Agency operate within three categories: A, B and C substances. A-substances are undesirable substances that ought to be replaced or reduced to a minimum. As far as B-substances are concerned there are guidelines for marginal values, and the substances ought to be regulated by the use of the best technology available. C-substances are regarded as unproblematic.

The distribution in percentages of the total consumption of auxiliary materials can be seen in the figure below:

**Auxiliary materials in relation to produced quantity of paper kg/tonnes DM**



**2014**



The table shows the distribution of auxiliary materials compared to quantity produced. It is to be seen that the consumption of auxiliary materials for production is at the same level as in 2013 all in all. Production has gone up which gives a less specific consumption. This is mainly due to changes of the production mix.

The distribution in percentages of the auxiliary materials consumption from the individual categories is at the same level as the consumption in 2013. There is a slight increase of the percentage of A substances. This is a natural consequence of a smaller consumption of auxiliary materials for waste water treatment. Thus the percentage goes up. A further increase must be expected in 2015.



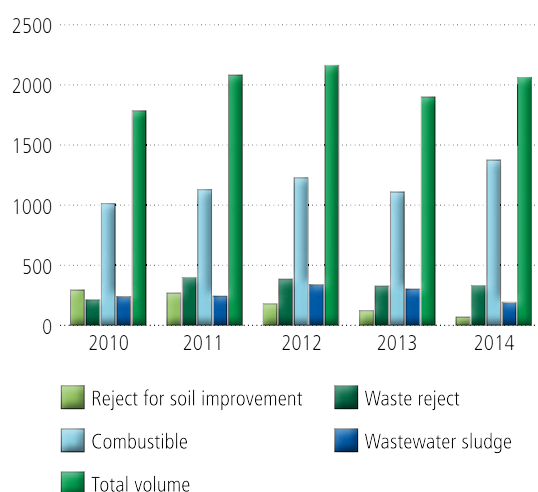
# Input and output of materials (continued)

## Waste/reject

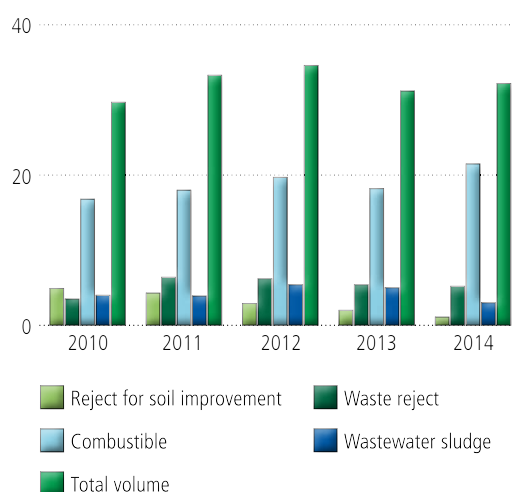
Waste and reject from the mill mainly consist of discarded impurities from paper raw materials containing a number of non-usable materials, such as plastic, paper clips, glass, fabric remnants, etc. These residual products are discarded through several cleaning units.

It is to be seen that the quantity of combustible waste has gone up in 2014. This is connected with the reconstruction of the PU section, which resulted in a larger excretion of impurities. The quantity must be compared to the considerable fall in the waste quantity for reject for soil improvement, linked up with the same reconstruction. A part fraction from here is now turned into combustible waste.

Waste and reject quantities in tonnes DM



Waste and reject compared to produced quantities of paper kg/tonnes DM



The term waste reject covers waste from the pulper, which primarily consists of metal and plastic.

The waste reject is sent for further processing, where the metal parts are sorted out and recycled, and the combustible waste is utilised.

The term "reject for soil improvement" is a waste product primarily consisting of paper fibres mixed with a minor part of styropor and plastic. This waste fraction is transported to a controlled composting, before it is used for soil improvement. This fraction was expected to be left out after the reconstruction of the mill's pulper section end of 2013. However, the reconstruction did not have the effect needed, and therefore the fraction has been there most of 2014.

The goal for 2014 was to reduce the total specific quantity of waste compared to 2013. We had no success with that, and especially because we did not achieve the desired effect of the reconstruction of the cleaning units in the pulper section. We are still working on the project in order to achieve the expected positive effect on the cleaning and reject quantities.

Photo: Recycled paper





*Photo: Warehouse*



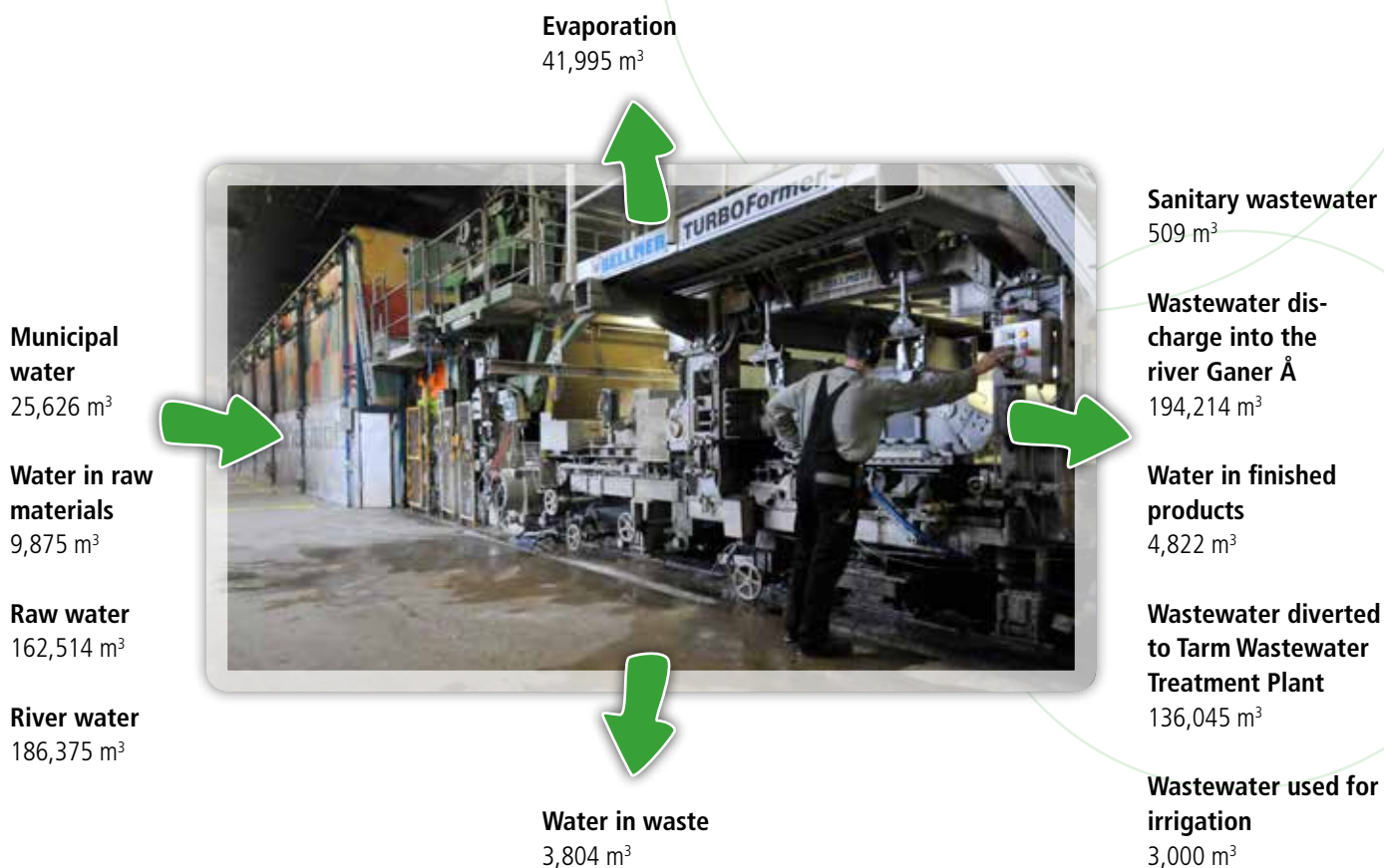






*Photo: Fully automated slitting, robot puts discs on pallets*

# Water balance



## Notes on specification of volume

Municipal water	Consumption is measured
Water in raw materials	Decided based on measurements of random sampling
River water	Consumption is measured
Raw water	Consumption is measured
Evaporation	Calculated on the basis of material balance of the water
Water in waste (reject and sludge)	Decided based on measurements of random sampling
Sanitary waste water	Discharge is measured
Discharge to recipient	Discharge is measured
Diverted to Tarm Wastewater Treatment plant	Discharge is measured
Wastewater for irrigation	Estimated consumption based on days with irrigation
Water in finished products	Calculated/measured (7% water content)

# Water balance (continued)

## Water intake

In the first half of 2014 river water was used as process water for the paper production. As from June 2014 unfiltered water from a former drinking water drilling has been used as process water. This water quality is in the report referred to as "raw water". Ringkøbing-Skjern Forsyning wanted to supply the mill with raw water for the paper production. This resulted in a 3 months' test, which was satisfactory and thus carried on to permanent use. Condensate from heat pumps has during most part of 2014 been led to wastewater treatment.

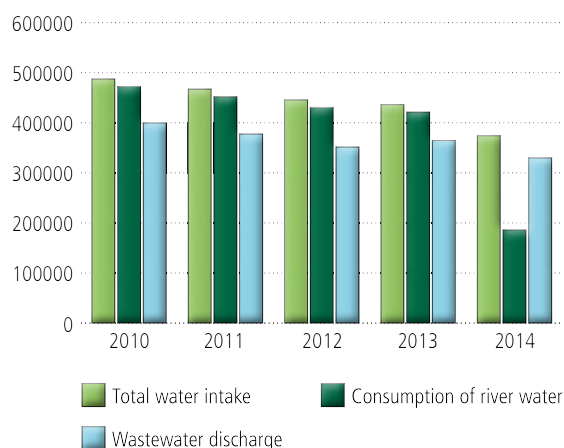
Most of the process water is used through the spray nozzles on the paper machine. Then recycling of the process water starts, as the water is recycled approx. 15-20 times before discharged to the treatment plant. The process water is filtered in vargo filters to retain fibres.

Photo: Paper production



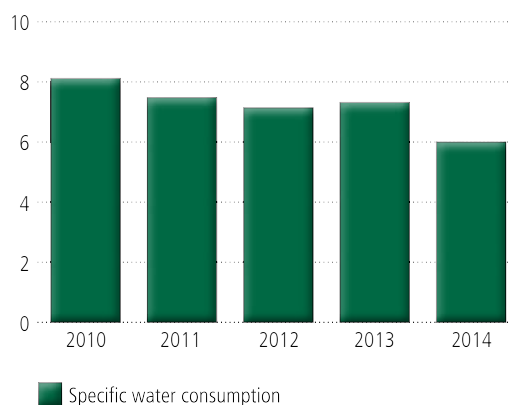
In 2014 there has been a reduction in water intake of 14 %. The goal of a reduction of 5% has been achieved by a very good margin, although that the condensate has not been reused as much as was expected.

**Water intake and wastewater discharge measured in m<sup>3</sup>**



Below figure shows the specific water consumption for the last 5 years.

**Water consumption per produced tonne of paper measured in m<sup>3</sup>/tonne of paper**



In 2014 there has been a reduction of the specific water consumption from 7.33 m<sup>3</sup> / tonne DM finished goods to 6.00 m<sup>3</sup> / tonne DM finished goods, equal to a fall of 18 %. This is primarily due to an increased focus on the water consumption and a considerably higher production in total, which has a direct influence on the specific water consumption. Furthermore, there is a reduction due to less water consumption to wastewater treatment plant.



# Water balance (continued)

## Goals for 2015

The goal is to reduce the water intake by another 10,000 m<sup>3</sup>. This could be realised by achieving an increased recycling of condensate or other wastewater streams.

Skjern Papirfabrik always had the tradition to purify the process wastewater on our own treatment plant before discharge to the recipient. In consequence of an increased strain on the treatment plant we had to extend and reconstruct to adapt the purification to the environmental requirements for wastewater. In this connection we contacted Ringkøbing-Skjern Forsyning to investigate the possibility to discharge the total quantity of wastewater to their treatment plant in Tarm. This was under consideration, partly due to uncertainties as to future environmental requirements, and partly due to anticipations of large investments for expansion of the treatment plant. This together with surplus capacity at the Tarm wastewater treatment plant made the considerations as to mutual purification actual.

During the spring of 2014 an agreement was made to supply the wastewater to Tarm wastewater treatment plant, and since week 29 all wastewater has been led to the Tarm plant. This is a community-economic advantage, too, as the two wastewater types complement one another perfectly, as COD, N, P and temperature conditions match perfectly in general, and the total environmental impact will be reduced by this cooperation.

Wastewater will in the following pages be described individually, whether it is purified in our own plant or led to the plant in Tarm.

*Photo: Tarm wastewater treatment plant*



# Water balance (continued)

## Discharge from our own wastewater treatment plant

Calculations for discharge are only made for data for the first 7 months of 2014, where wastewater was purified on our own treatment plant.

	Required value	Control value *	Glossary: COD: Chemical oxygen consumption BOD: Biological Oxygen Consumption (5 days) COD and BOD are both indicators of the content of organic matter in wastewater TOT N: Total content of nitrogen TOT P: Total content of phosphorus SS: Suspended solids in the wastewater * Statistical statement of measured values acc. to the calculation programme DS 2399
<b>COD</b>	75 mg/l*	65.6 mg/l	
<b>BOD</b>	15 mg/l	2.9 mg/l	
<b>TOT N</b>	8 mg/l	2.6 mg/l	
<b>TOT P</b>	0.5 mg/l	0.1 mg/l	
<b>SS</b>	25 mg/l	5.5 mg/l	

*Calculated discharge data from wastewater treatment plant*

The above table shows the calculated control values for wastewater discharge from Skjern Papirfabrik's own wastewater treatment plant for the months in which the plant was running in 2014. As it appears from the above results there was in 2014 a good margin from the obtained results to the required values applicable for the treatment plant.

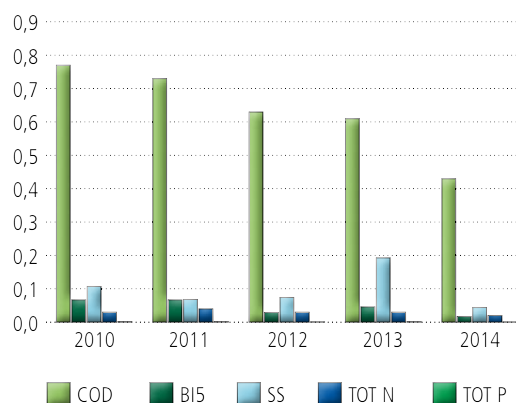
In 2014 there has been a marked improvement of the operating results compared to previous years. In 2014 there were no significant problems with the sludge properties, and this contributes very much to the improvement. The wastewater treatment plant could thus be closed down with a satisfactory operation until the very last day.

In 2014 there was a marked improvement of COD compared to 2013.

The goal for reducing the specific COD emission from 0.61 kg COD/tonne DM finished goods in 2013 to 0.59 kg COD / tonne DM finished goods in 2014 was achieved by a good margin, as the result for the specific COD emission was 0.43 kg COD / tonne DM finished goods for the period in which the treatment plant was running.

The main reasons for the significant improvement of the purification were an ongoing control of filamentous bacteria, less strain on the wastewater treatment plant during periods of reduced operations, less consumption of adhesives in production compared to produced tonnes, and the use of precipitant as polishing for SS and COD many times in 2014.

## Specific discharge from the wastewater treatment plant kg/tonne DM finished goods



# Water balance (continued)

## Discharge to public wastewater treatment plant

Parameter	Required value	Average discharge
Volume of water	1,240 m <sup>3</sup> /day	915 m <sup>3</sup> /day
pH	6.0 – 9.0	7.2
SS	500 mg/l	385 mg/l
COD	11,000 mg/l	3,054 mg/l
BOD	6,200 mg/l	1,700 mg/l
Tot-N	20 mg/l	14.2 mg/l
Tot-P	3 mg/l	2.2 mg/l
Chloride	1,000 mg/l	72.2 mg/l
Oil/grease	20 mg/l	10.1 mg/l
Chrome	0.3 mg/l	0.005 mg/l
Zinc	3 mg/l	0.13 mg/l
Cadmium	0.003 mg/l	0.0003 mg/l
Molybdenum	0.03 mg/l	0.008 mg/l
Lead	0.1 mg/l	0.008 mg/l

In future all wastewater will be purified at the Tarm wastewater treatment plant. Therefore, no goals will be set for the wastewater treatment, but instead focus will be on water consumption and wastewater amount.

The total wastewater amount was in 2014 333,259 m<sup>3</sup>. The goal for 2015 is to reduce the wastewater amount by approx. 10,000 m<sup>3</sup> compared to 2014. A reduction of 10,000 m<sup>3</sup> corresponds to a reduced discharge of approx. 3.0 % compared to 2014.

This is expected to be realised by a solution in the 2nd half of 2015 for recycling of condensate from the discharge to the air/ water exchanger. However, there will be an extra wastewater stream from the wood chips fired boiler plant, which will probably come into operation during the 4th quarter of 2015. An amount of approx. 4,000 m<sup>3</sup> of wastewater is expected from here in 2015.

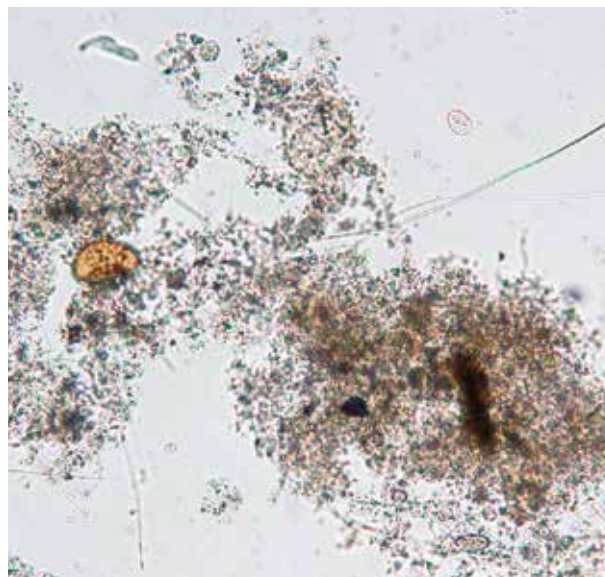
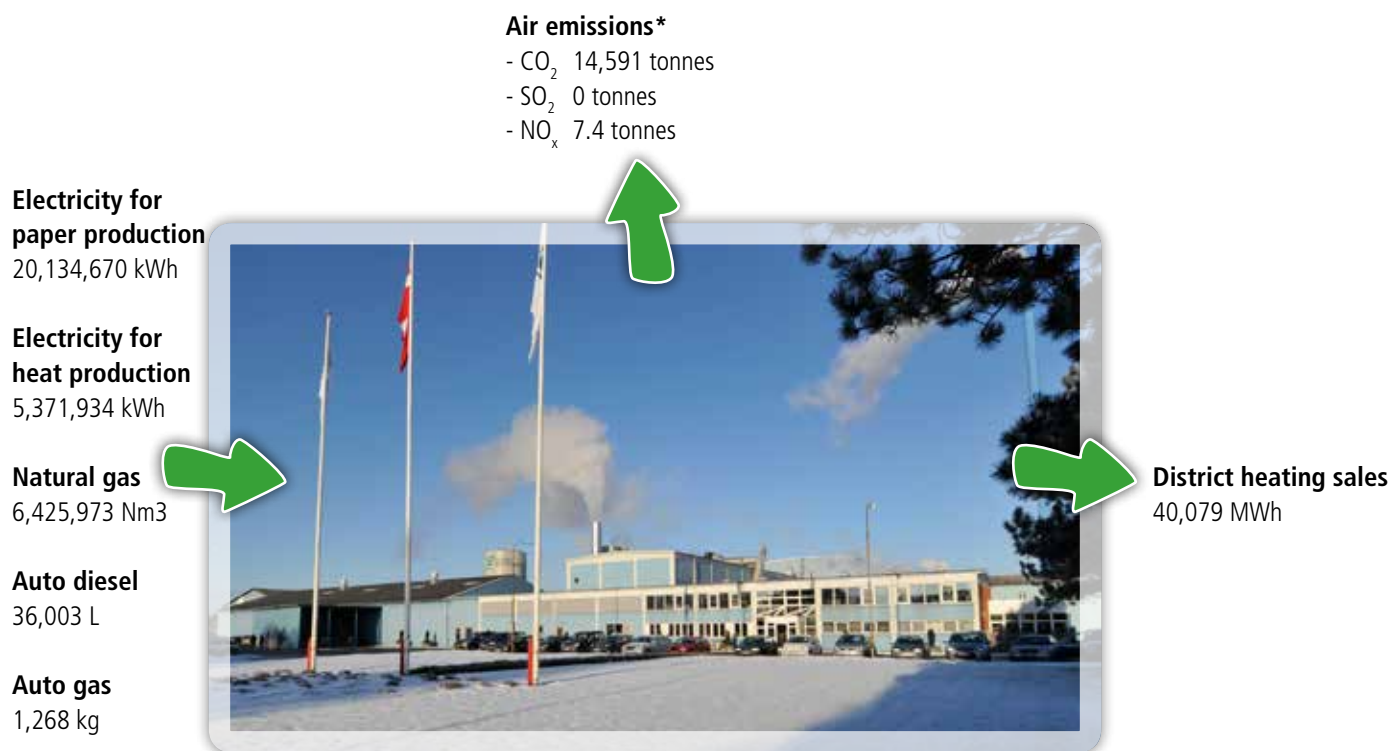


Photo: Microscopic examination of sludge





# Energy balance



*\*Relevant emissions according to environmental mapping*

## Notes on specifications of values

<b>Electricity, natural gas and oil</b>	Measured, consumed amount
<b>CO<sub>2</sub> og NO<sub>x</sub></b>	Calculated on the basis of emission factors from the home page of the Danish Energy Agency and key figures provided by Force
<b>Auto diesel and auto gas</b>	Purchased quantity

### Use of energy

Natural gas: Used for steam production in boilers

Electricity: Used for electric motors, trucks, pumps, agitators, ventilators, etc.

Auto diesel: Used for loader tractors

Auto gas: Used for trucks in smaller amounts

As a result of a large change to electric-powered trucks by the end of 2013 there is a considerable decrease of the consumption of auto diesel and auto gas in 2014.

### District heating sales

Since 2010 there has been a production of district heating from a gas boiler and from a large heat pump plant, utilising the surplus heat from the drying unit of the paper machine.

The mill has Denmark's largest heat pump plant.

# Energy balance (continued)

## Energy related investments in 2014

2014 was the year where a decision was made to proceed with the largest investment of the mill so far. The establishment of a wood chips fired steam boiler facility. A similar investment has previously been under serious consideration in 2008, where it was dropped due to the global financial crisis.

The price of the plant is almost 70 million DKK, including another large heat pump.

In 2013 the Danish government passed an ambitious subsidy scheme, the VE-funds, for the distribution of industrial district heating and further use of biomass within the industry, which made it possible to invest in that scale. Funds from here will cover approx. half of the total project price, so the net investment is reduced considerably. The heat pump installation as mentioned before is not part of the VE-project, it is funded by the sale of kWh rights. We are dealing with very big decisions, thus showing great expectations for the future. The decision-making process was relatively short; the financial consequences were estimated together with the consultancy firm of Viegand & Maagøe. The contract for the boiler plant was signed in July with Aktive Energianlæg, and the building was ordered end of October with a local contractor, Jacobsen & Winding. The total facility is expected to be finished around November 1.

The plant will be constructed as fully-automatic with appurtenant roofed wood chips storeroom and crane facilities. Expected yearly consumption is 27,000 tonnes of wood chips, to be supplied from forests in western Jutland within a range of 40 kilometres. This will increase the yearly lorry traffic to the mill by approx. 1,000 loads, from 7,000 to 8,000. In order to meet traffic-related challenges a turning lane with room for 5-6 lorries will be established within the same project.

In connection with operation of the plant a considerable share of low temperature waste heat will be developed, which will be utilised by discharge to the local district heating company. This means an extension of the current agreement with Skjern Fjernvarme, which has then, on condition of the right terms, a guarantee for a total purchase of more than 48,000 MWh/year, corresponding to approx. 70 % of the total district heating production for Skjern City.

In connection with the utilisation of the waste heat and the district heating production another storage tank must be build, so the factory will then have 2 x 1,250 m<sup>3</sup> at our disposal.

*Photo: District heating production*





# Energy balance (continued)

## Goals and results for energy 2014

Goals and results are described in the following table:

Goals and results specific consumption	Goal on 31/12 2014	Result on 31/12 2014
Specific gas consumption	96.3 n m <sup>3</sup> /gross tonne	93.3 n m <sup>3</sup> /gross tonne
Specific electricity consumption	288.5 kWh/gross tonne	292.3 kWh/gross tonne

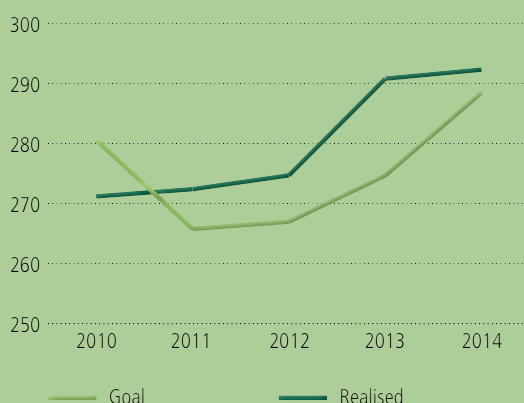
The table shows that the specific gas consumption ended up 3 % lower than the goal, which is most satisfactory. The explanation is partly the produced product mix of the year, partly the fact that the total production in 2014 ended up as the highest one in the mill's history.



## Development in energy consumption

The following four diagrams show the development in energy for the last 5 years, both the specific consumption and the total consumption in electricity and gas, respectively.

Development in electricity compared to goal kWh/gross tonne



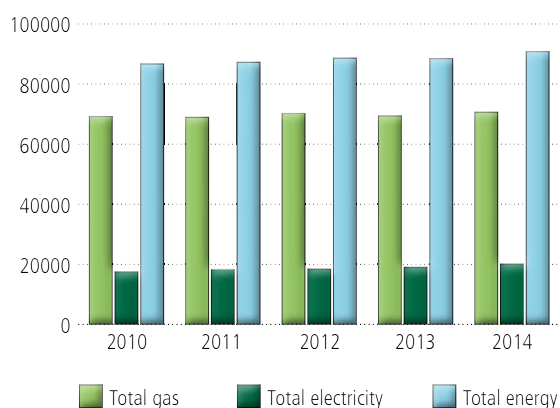
Development in gas compared to goal Nm<sup>3</sup>/gross tonne



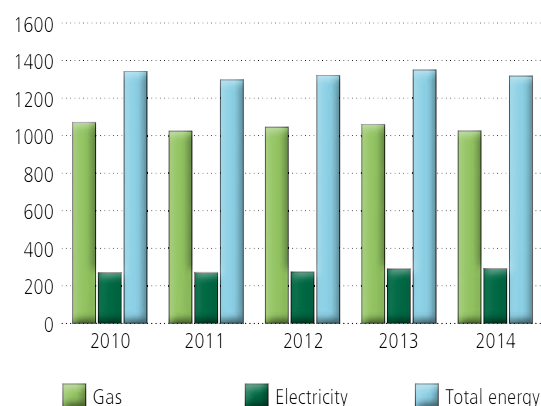
Photo: Installation of wood chips boiler

# Energy balance (continued)

**Total energy consumption MWh**



**Specific energy consumption kWh/gross tonne**



## Development in air emissions

There has been a slight decrease in specific air emissions. The reason can be found in the specific gas consumption having decreased.

	Specific CO <sub>2</sub> emissions	Specific SO <sub>2</sub> emissions	Specific NO <sub>x</sub> emissions
<b>2010</b>	237.2 kg/tonnes DM	0.0 kg/tonnes DM	0.121 kg/tonnes DM
<b>2011</b>	228.6 kg/tonnes DM	0.0 kg/tonnes DM	0.117 kg/tonnes DM
<b>2012</b>	233.5 kg/tonnes DM	0.0 kg/tonnes DM	0.119 kg/tonnes DM
<b>2013</b>	236.6 kg/tonnes DM	0.0 kg/tonnes DM	0.120 kg/tonnes DM
<b>2014</b>	227.7 kg/tonnes DM	0.0 kg/tonnes DM	0.116 kg/tonnes DM

## Goals and action plans 2015

The project from 2014 concerning 200 kW exhaustion fan is transferred. In 2014 a report for the project was made as a bachelor project by two Bachelor of Technology Management and Marine Engineering students. The recommendations stated in the report must be adjusted and executed.

There will be high focus on the project with establishment of the wood chips fired steam central, and the optimisation of fuel utilisation from this.

The factory's considerable production of district heating is also an important focus point. Extension of this will have a positive impact on the factory's net energy balance.

# Global Compact

## The report's relation to Global Compact

As a member of the UN Global Compact Skjern Papirfabrik is obliged to be in compliance with the 10 basic principles.

Skjern Papirfabrik has since 2013 been a member of the UN Global Compact and Global Compact's Nordic network.

The below table shows the context between the report and the 10 principles.

## The Global Compact principles

	The company should:	Pages
Human rights	01. Support and respect the protection of internationally proclaimed human rights 02. Make sure that they are not complicit in human rights abuses	12, 13
Workers' rights	03. Uphold the freedom of association and the effective recognition of the right to collective bargaining 04. Support the elimination of all forms of forced and compulsory labour 05. Support the effective abolition of child labour 06. Eliminate discrimination in respect of employment and occupation	11, 12, 13
Environment	07. Support a precautionary approach to environmental challenges 08. Undertake initiatives to promote greater environmental responsibility 09. Encourage the development and diffusion of environmentally friendly technologies	7-10, 14-30
Anti-corruption	10. Work against corruption in all its forms, including extortion and bribery	12, 13

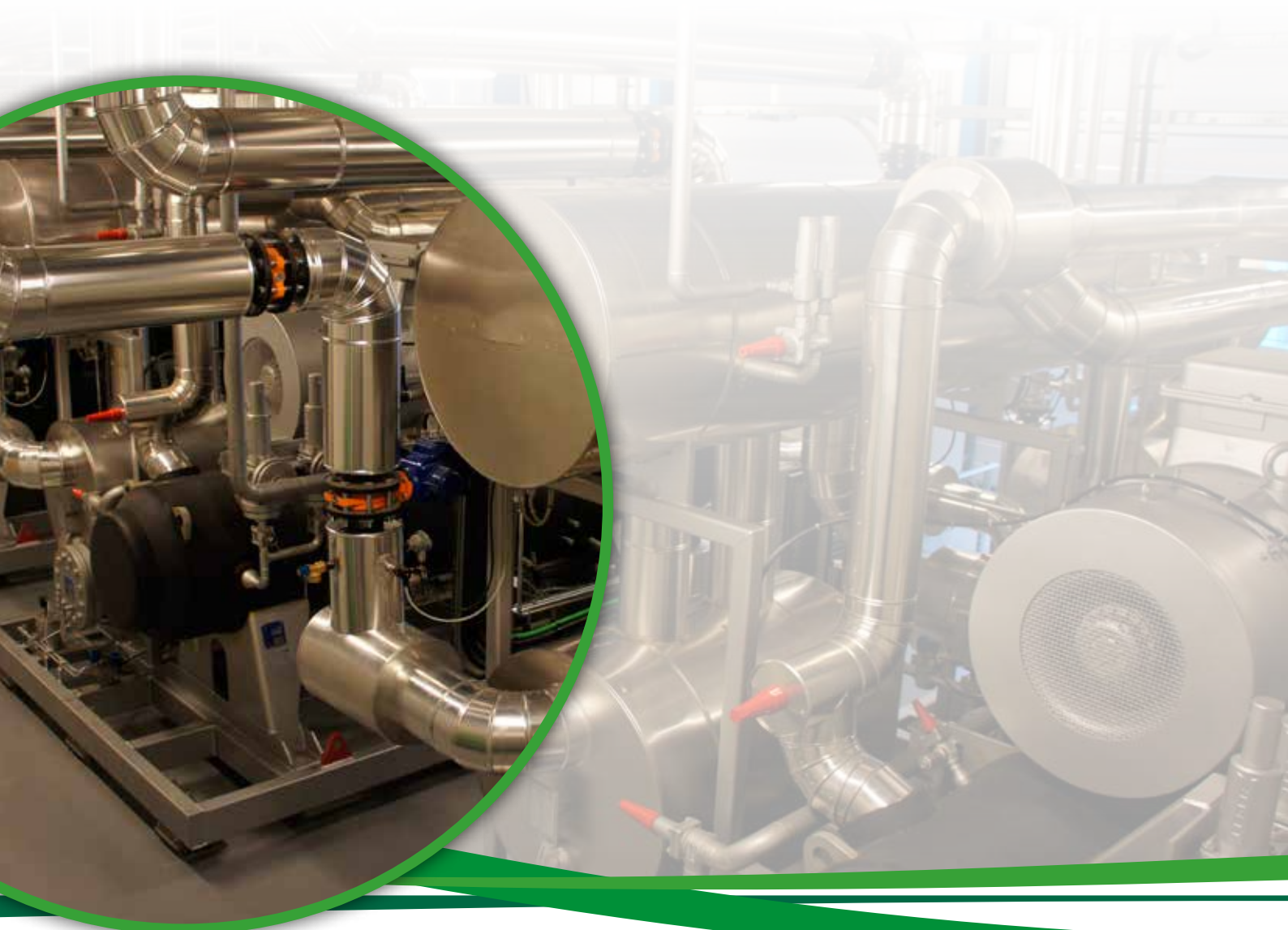
Read more about the UN Global Compact and the principles of the organisation on

[www.unglobalcompact.org](http://www.unglobalcompact.org)





*Photo: Heat pump facility for production of district heating*



# Glossary

<b>Accredited</b>	Approved
<b>Active sludge</b>	Biological wastewater treatment with bacteria
<b>Audit</b>	Accountants going through materials
<b>Workplace evaluation</b>	Workplace assessment
<b>BAT</b>	Best Available Technique, criteria set out in BREF document
<b>BOD</b>	Biological oxygen demand in the course of 5 days, also called B <sub>5</sub>
<b>BREF</b>	Large European document describing the technology behind BAT
<b>COD</b>	Chemical Oxygen demand in wastewater
<b>COP-faktor</b>	Efficiency (Coefficient of performance)
<b>CO<sub>2</sub></b>	Carbon dioxide
<b>DEHP</b>	Oil-based chemical substance, primarily used for softening plastic products
<b>Emissions</b>	Emissions in air of e.g. NO <sub>x</sub> and CO <sub>2</sub>
<b>FSC</b>	Certification based on the use of wood fibres from responsible sources
<b>Required value</b>	Conditions in the environmental approval
<b>LAS</b>	Hazardous substances, mostly derived from soap
<b>NO<sub>x</sub></b>	Nitrogen oxide
<b>NPE</b>	Hazardous substances, mostly derived from soap
<b>PAH</b>	Polycyclic aromatic hydrocarbons, often referred to as tar
<b>RGV</b>	Flue gas heat exchanger
<b>Tot-N</b>	Total amount of nitrogen in a sample
<b>Tot-P</b>	Total amount of phosphorus in a sample
<b>SO<sub>2</sub></b>	Sulphur dioxide
<b>SRO system</b>	Computerised monitoring and management of the operations of the wastewater treatment plant, boiler house and heat pump system
<b>SS</b>	Suspended solids from wastewater

Photo: Painting given to Skjern Papirfabrik A/S in connection with the initialisation of heat pumps.  
The painting symbolises the cooperation between Skjern Papirfabrik A/S and Skjern Fjernvarme.



Photos: Building phase for wood chips boiler



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# Verification

  
**DNV BUSINESS ASSURANCE**  
**APPENDIX**

til erklæring nr. 76302-2010-AE-DEN-DANAK for

**Skjern Papirfabrik A/S**

Verifikation og validering omfatter følgende adresser:  
Birkvej 14, DK-6900 Skjern, Danmark

NACE rev. 2: 171200

Næste validering udføres (år-måned):	Entydig identifikation af valideret miljødeklaration og underskrift for gennemførelse:
2014-03	Miljødeklaration 2013 Skjern Papirfabrik
	Sign. Lead-auditor:  Dato: 12/3-2014
2015-03	Bæredygtighedsrapport 2014 Skjern Papirfabrik
	Sign. Lead-auditor:  Dato: 4/3-2015

Denne erklæring er gyldigt til:  
**2016-04-30**

Verifikation og validering  
er udført af:

**Kirsten Høj Jensen**  
Lead Auditor

Sted og dato:  
Hellerup, 2013-04-08

**DET NORSKE VERITAS,**  
BUSINESS ASSURANCE, DANMARK A/S

  
**Lars Appel**  
Adm. Direktør

  
DK-V 0001

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