



# ENVIRONMENTAL AND ENERGY REPORT 2014

**nora**<sup>®</sup>

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# FOREWORD FROM THE BOARD

Dear readers,

In December 1996, Freudenberg Bausysteme KG was for the first time audited under the rules of Directive No. 1836/93 (EEC), usually known as the EC's Eco-Management and Audit Scheme or EMAS, and its Environmental Declaration validated. In 2007, Freudenberg Bausysteme KG was sold to an investor and since has been operating under the name nora systems GmbH.

In addition to EMAS, Freudenberg Bausysteme KG, and later we as nora systems GmbH, arranged for our eco-management systems to be certified since 1999 under the international DIN EN ISO 14001 standard.

In compliance with the EMAS validation, those responsible submitted an updated environmental report instead of the validated Environmental Declaration. This environmental report reported on the continuous and progressing development of the eco-management system, the corporate environmental protection programme, the recording and analysis of our environmental impacts, and the implementation of our environmental goals.

In 2015, we shall arrange for our energy management system to be certified under DIN EN ISO 50001. Accordingly, this restructured report will represent the first environmental and energy report.

If you have any further questions, please get in touch with us directly (see also page 20).

Weinheim, June 2015



Christa Hoffmann  
CEO



Andreas Mueller  
CEO



# 1 COMPANY PORTRAIT

nora systems GmbH was founded in October 2007. The company is successor in title of the Freudenberg Bausysteme KG business group, an autonomous enterprise since 1995, arisen from a division of the company Carl Freudenberg.

The sales companies in some countries work independently. They form together with the production site, administration and development department the new nora systems GmbH. The corporate structure involved is depicted below.

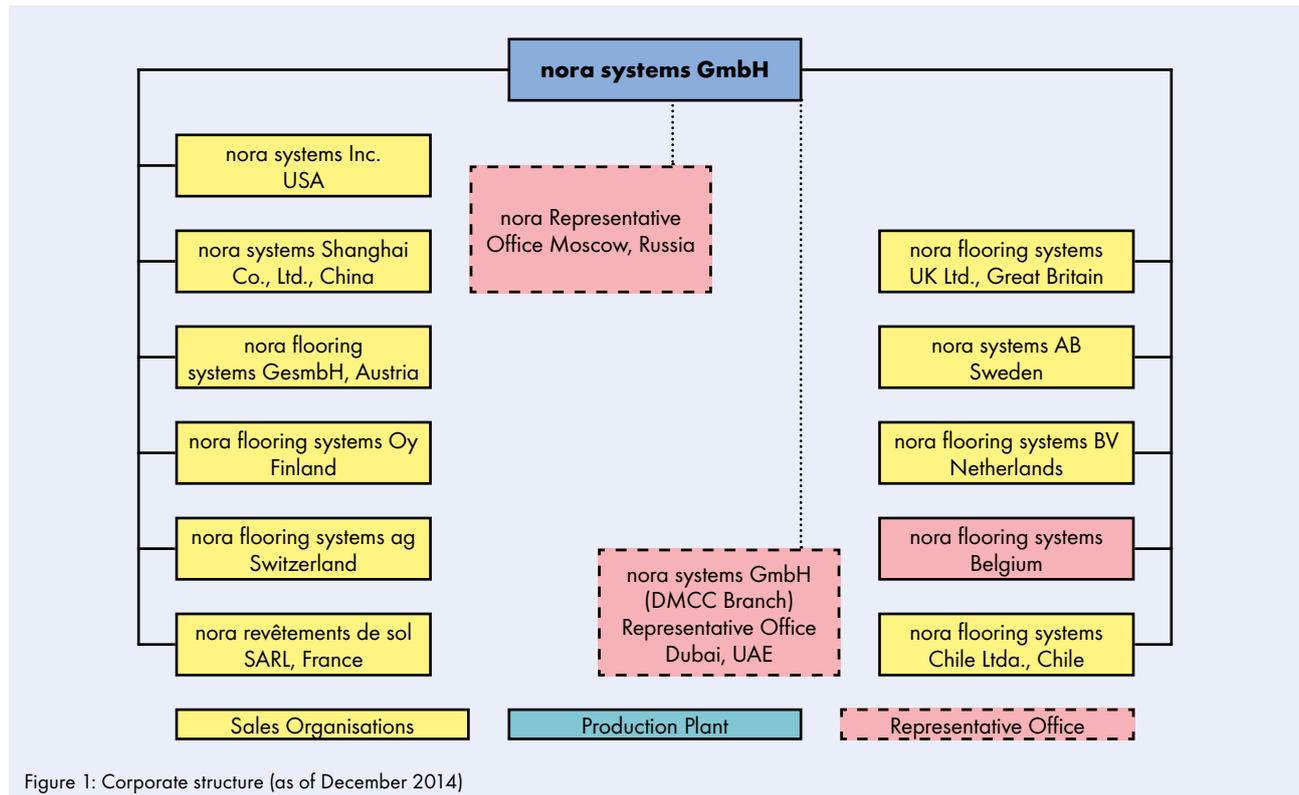


Figure 1: Corporate structure (as of December 2014)

nora systems GmbH is a company specialising in high-quality floor covering systems and shoe components. With a production output of more than 6 million square metres a year, nora systems GmbH is the world's market leader for resilient rubber-based floor coverings. The noraplan® sheetware are vulcanised in an endless web on automatic continuous lines, while the norament® tiles are produced in multiplaten presses. The materials for shoe components and the expanded-material sheets for orthopaedic applications are likewise manufactured in presses.

By the end of 2014, nora systems GmbH had 838 employees in Germany, about 429 of them in the production operation. Annual turnover in 2014 amounted to about 205 million euros. Development, production, administration and sales are concentrated at the facility in Weinheim. Sales abroad are all handled by local sales organisations, with another 276 staff worldwide.

The nora systems GmbH is located in the industrial park Weinheim ("Zwischen Dämmen"). The production lines and administrative buildings are essentially located in the south-west corner, where the "Alte Weschnitz" river arm forms the area's southern boundary. The buildings are rented from Freudenberg Immobilien Management GmbH.

Weinheim is conveniently situated in the Rhine valley, on the edge of the Odenwald Forest, in the vicinity of Mannheim and Heidelberg. The autobahn is only a few kilometres away.

On terms of European economic classification, the facility is assigned NACE Code 22.19.

# 2 ENVIRONMENTAL AND ENERGY POLICIES

nora systems GmbH is fully conscious of its responsibilities to the natural environment. Environmental protection and energy efficiency enjoy equal priority with other important corporate goals.

Environmental protection and energy efficiency are handled at boardroom level in nora systems GmbH. The goals of supporting and fostering eco- and energy saving awareness among our staff, and continuously improving corporate environmental protection with the best available technology which is also financially viable, are an integral constituent of corporate policy-making.

## 2.1 Guidelines

The management and all staff of nora systems GmbH are working systematically to assure continuous improvement of corporate environmental protection and energy efficiency. The aim is to use the best available technology, provided this can be reconciled with adequate cost-efficiency.

nora systems GmbH focuses on long-term goals: economical husbandry of all resources shows that ecology and economy are by no means mutually exclusive.

nora systems GmbH practices preventive environmental protection: compliance with environmental and energy legislation is a sine qua non, and is not restricted to the statutory minimum. Above and beyond the legal requirements, internal guidelines are enacted and appropriate action is taken to ensure our continuous improvement of corporate environmental protection and energy efficiency.

nora systems GmbH quantifies and analyses our energy aspects and uses the findings to derive goals and programmes towards improving its energy performance and reducing its energy consumption.

The management provides all of the information and resources needed to realise these goals.

nora systems GmbH develops, produces and sells products which are as eco-compatible and energy efficient as possible in terms of their manufacture, utilisation and disposal.

The following guidelines have been modified in anticipation of the targeted energy management certification.

nora systems GmbH regularly monitors the success of its environmental protection and energy efficiency initiatives by means of internal and external audits, measurements and analyses, together with mutual feedback in internal working groups and on external bodies.

Sustained success is possible only by involving all staff in line with their qualifications and responsibilities. Environmental protection and energy efficiency are therefore essential constituents of training and information.

nora systems GmbH keeps its customers informed about the eco-responsible production and utilisation of its long-lived products, and provides guidelines on how they can be recycled after the end of their useful lifetimes. One other goal of its processes is to lighten the load on both people and the environment to the largest possible extent.

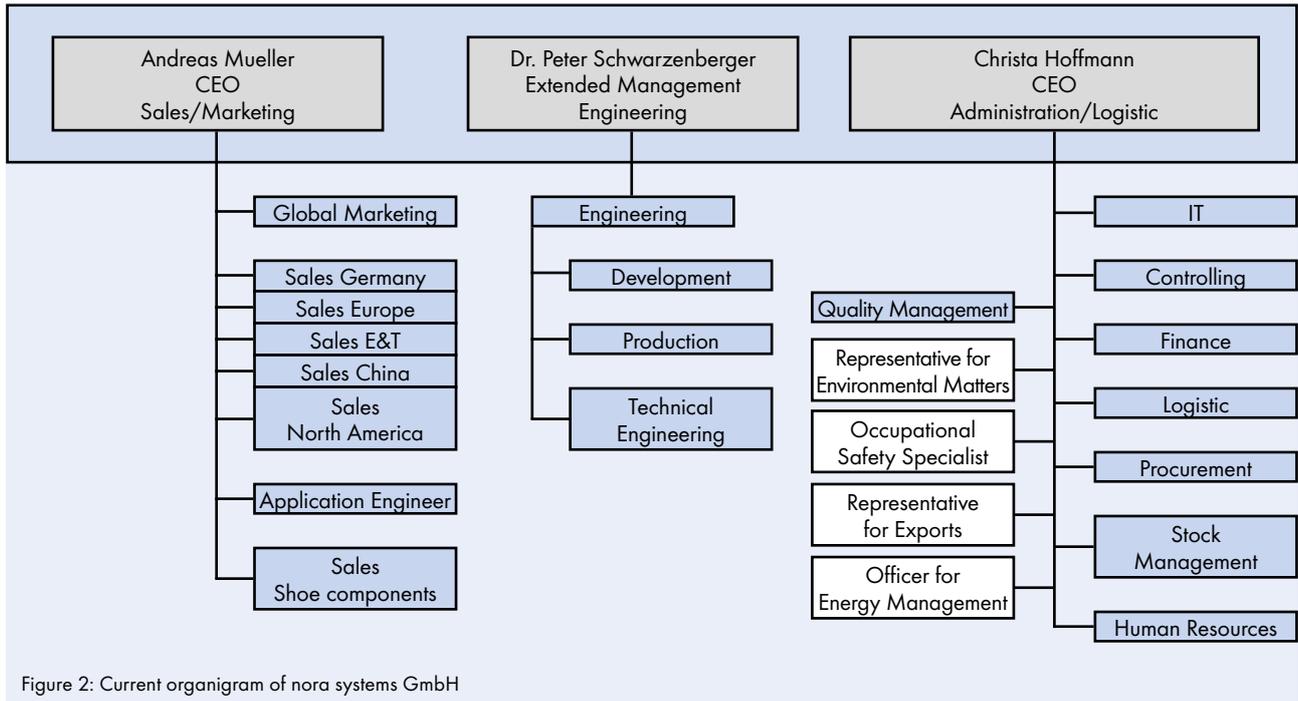
nora systems GmbH involves its business associates in implementing its environmental and energy policies. Raw and process materials, plus packing materials, are also selected and used in line with environmental criteria. Not only that, we also purchase energy efficient products and services whenever possible.

nora systems GmbH uses this environmental and energy report to keep the public informed of its eco- and energy-relevant activities, and also of improvements and goals already achieved or currently planned in our company.

## 2.2 Eco-management

CEO Christa Hoffmann bears overall responsibility for environmental preservation and energy management at nora systems GmbH. She is also consequently registered by name with the authority as being the person responsible in accordance with §52a BImSchG. The environment-related operational business activities were delegated to the Head of Technology, Dr. Peter Schwarzenberger. He is the company's Environmental Management Officer. The body entrusted with formulating

environmental protection goals and action plans is the Environmental Protection Committee. Ralf Bennebach fills the post of Energy Management Officer. The body entrusted with improving energy related services is the Energy Steering Committee. Environmental and energy policies and the eco- and energy programmes are implemented on all levels of the line organisation.



**Special remits in terms of environmental protection and measures for improving energy efficiency are handled by the following functions:**

- The Head of Development is responsible for the substances used in our products.
- The Head of Engineering is responsible for planning, installation and maintenance of lines and equipment.
- The Plant Officer for Environmental Protection coordinates and monitors all environmental protection activities.
- The Energy Management Officer coordinates the projects relevant to energy issues.
- The Hazardous Goods Officer is an employee of the logistics department.
- The Freudenberg Service KG operates the Industrial Estate in Weinheim. The following of the environmentally relevant tasks are handled there under contractual arrangements on behalf of nora systems GmbH:
  - full-time plant fire brigade for emergencies
  - supplying energy and water
  - waste water disposal in a clarification plant
- The commissioning of an employee as emission control and waste officer is not necessary according to legal regulations.

A detailed description of how corporate environmental protection has been organised is provided in an Eco-Management Manual, which is written and updated by the Plant Officer for Environmental Protection.

The eco-management system is regularly monitored by internal and external auditors. Any deviations from the rules discovered are discussed in the Environmental Protection Committee, and eliminated by appropriate measures taken in consultative coordination with the board.

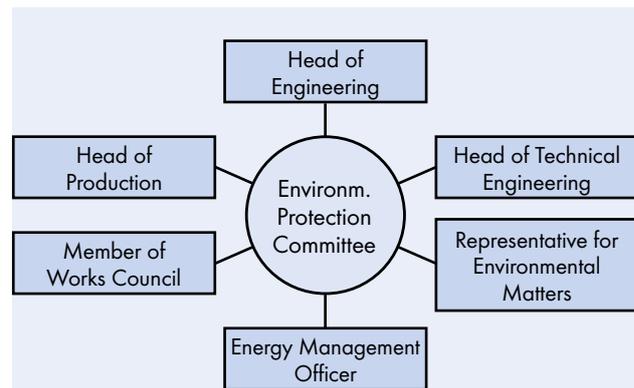


Figure 3: Composition of the Environmental Protection Committee

The system limits, layout, and organisation of the corporate energy management system are described in documented procedures that are created and maintained by the Energy Management Officer.

The measures for improving energy related services are based on the continuous improvement process known as the PDCA (plan-do-check-act) cycle and integrate the energy management in the organisation's day-to-day business.

The energy management system is monitored by internal and external auditors at regular intervals.

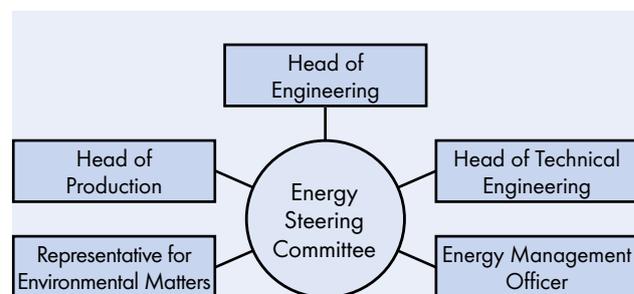


Figure 4: Composition of the Energy Steering Committee

# 3 ENVIRONMENTAL IMPACTS AND ENERGY UTILISATIONS

## 3.1 Production of floor coverings from rubber

The diagram below shows in simplified form the process used for manufacturing floor coverings from rubber.

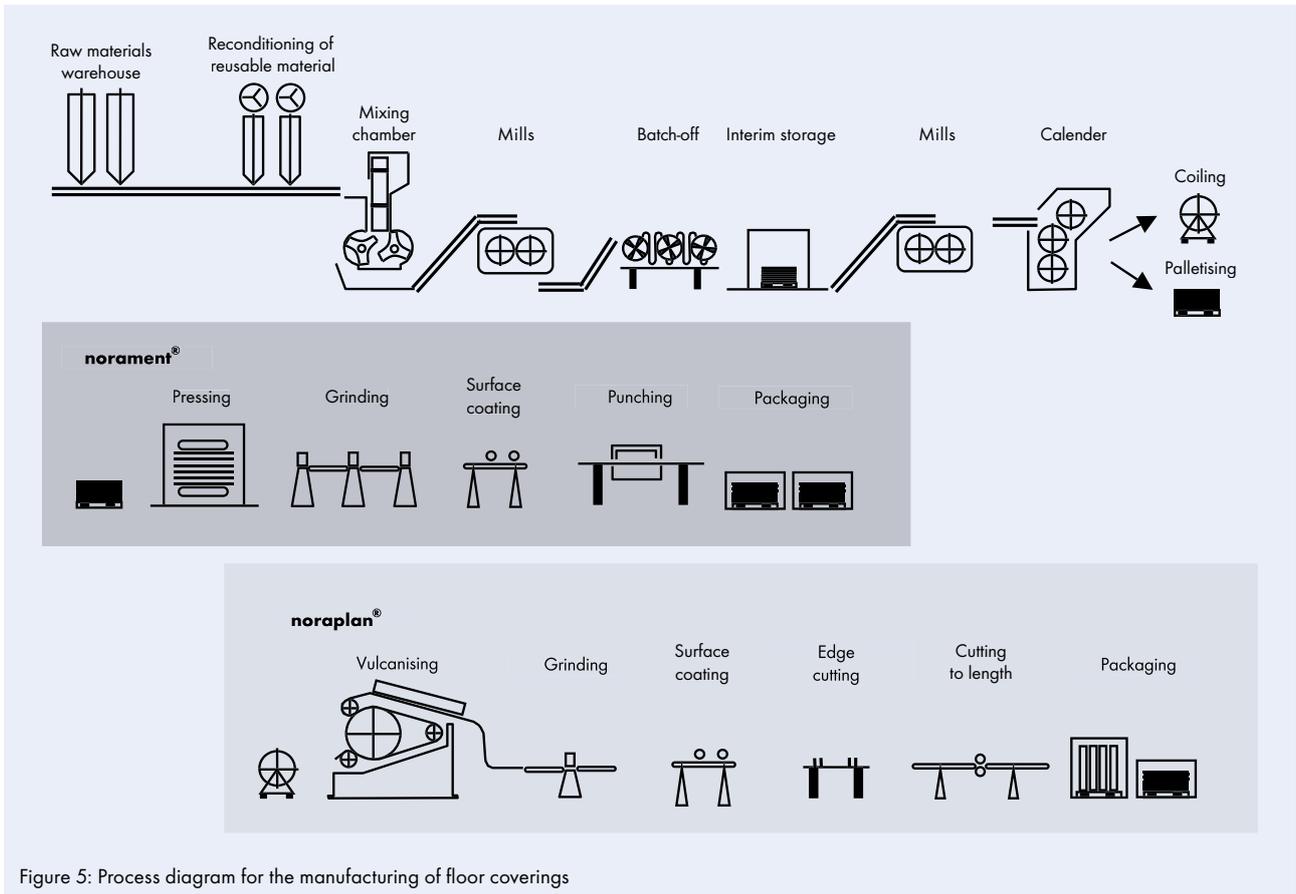


Figure 5: Process diagram for the manufacturing of floor coverings

On the basis of a recommendation by the European Commission (2001/680 EC), the environmental impacts attributable to nora systems GmbH have been determined. The results are summarised in the table below.

<b>Assessing environmental impacts</b>		
STAGES OF THE ECONOMIC CYCLE		
<b>Activities</b>	<b>Nature of environmental impacts</b>	<b>Influencing options</b>
<b>Procurement</b> Purchase of starting materials for processing, distribution and marketing		
Purchasing of raw materials for the production process	Exhaustion of non-renewable raw materials Exploitation of raw material resources Energy consumption for raw material production and transport	Purchase renewable raw materials Use geogenic fillers Be alert for renaturation options Purchase recyclable materials Minimise the quantity of hazardous substances and hazardous goods Minimise transportation distances
Purchasing of process materials like paper, cardboard and other packing materials	Wood consumption, water pollution	Purchasing of recycled paper and cardboard Re-usability/recyclable materials
<b>Development</b> Product development		
Development of new products/ design enhancement of existing ones	Indirect effects: raw material selection, product design, health aspects	Minimise the use of hazardous substances, re-usability/disposability Minimise emissions
<b>Production</b> Product manufacture		
Storage of raw and process materials	Pollution of the environment with chemicals Fire risk with emissions of conflagration gases	Use suitable storage to avoid discharging unwanted substances into the environment Precautions for emergencies/accidents
Mixing the raw rubber mixtures	Pollution of the air by emissions Disposal of waste mixtures (defective batches, cleaning rubber) Removal of groundwater for cooling purposes	Dust arrestance units Minimise the cleaning cycles and multiple use Avoid preparation errors Recycling of waste Reduce amount of groundwater removed for cooling purposes
Calanderising blank rolls	Disposal of waste mixtures Removal of groundwater for cooling purposes	Minimise startup and shut-down losses Recycling of waste Reduce amount of groundwater removed for cooling purposes
Vulcanisation in presses	Emissions into the air Disposal of edge trim waste	Minimise lateral waste Recycling of waste
Vulcanisation on continuous machines	Emissions into the air Disposal of waste, startup and shut-down losses, grinding dust Removal of groundwater for cooling purposes	Minimise startup and shut-down losses Recycling of waste Reduce amount of groundwater removed for cooling purposes

Finishing (punching, grinding)	Disposal of waste (punching waste, grinding dust) Removal of groundwater for cooling purposes	Recycling of waste Reduce amount of groundwater removed for cooling purposes
Order-picking	Disposal of waste (sorting losses)	Recycling of waste
<b>Marketing and administration</b> Sales promotion and marketing of products and services		
Informing customers about our products	Reduction in amount of waste entering the environment	Communicate appropriate information on installation, cleaning, disposal
Office activities involving use of energy, paper and office equipment	Reduction in amount of waste entering the environment	Separate the waste collected
<b>Distribution</b> Road and air transportation of products from their place of manufacture to wholesalers and customers		
Use of cardboard and films for transport packing	Reduction in amount of waste entering the environment Reduced consumption of materials	Use PE films, cardboard and wood Take back packing material
Road and air traffic	Global warming and local air pollution, exhaustion of mineral oil reserves, traffic jams and noise pollution	Use sea freight Optimise freight quantities per transportation trip
<b>Disposal</b>		
Waste disposal by the company	Possible waste entering the environment	Ensure that as much as possible is recovered
Disposal of product packaging and installation residues by client	Increased amount of commercial waste	Use packaging made of recyclable material and recoverable substances
Disposal of removed floor coverings	Waste entering the environment	Offer to take back products after removal

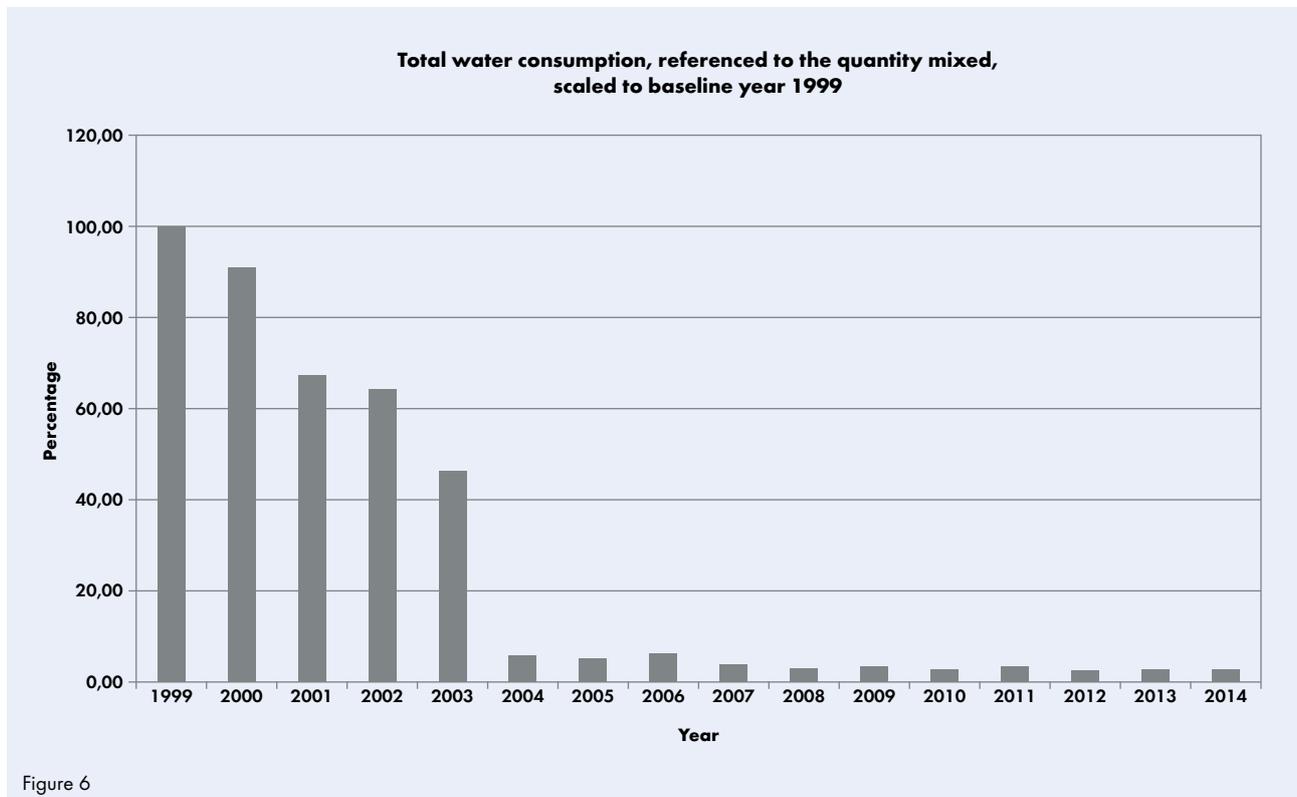
Table 1: Environmental impacts

Environmental impacts within the specific meaning of the EMAS Directive cover not only the consumption of energy and natural environmental goods like raw materials, but also the emissions into air and water, waste and noise, insofar as their impacts extend beyond the site's boundaries. They are quantified and explained in the sections below.

The figures given below are from time-series covering several years. The data given are relative data, since they are always referenced to the quantity mixed of the year concerned. Experience has shown that this is essential if the annual figures are to be meaningfully compared. The quantity mixed is the total masses of all raw and process materials made into raw mixtures in the mixing chamber.

## 3.2 Water and waste water

Water consumption is referenced to the quantity mixed, based on the resulting comparability of the annual data. The quantity of water consumed in the reference year 1999 in cubic metres per tonne mixed is indicated by 100%.



The total water quantity is composed of several different water qualities. The breakdown of water categories for 2014 was:

Well water (cooling water)	15%
Municipal water (drinking, sanitary water)	40%
Demineralised water	45%

In total the water consumption for 2014 could be reduced by up to 95% to less than 5% in comparison to the year 1999. In substance this is caused by the decrease of well water; therefore the percentage of demineralised water (for cooling towers) and municipal water (sanitary) has increased respectively.

Starting in 2007, well water, which is provided by Freudenberg Service KG on the industrial estate "Zwischen Dämmen", is now being used only as an additional coolant in the summer. Else the production line is cooled via own cooling towers and thermal/electrical generated cooling energy from the power plant of Freudenberg Service KG.

The municipal water from the public supply is used as drinking water and in the sanitary facilities; the resultant waste water corresponds to domestic waste water in terms of its composition.

Demineralised water is used in processes and machines where deposits of salts dissolved in water absolutely have to be avoided, especially in cooling towers.

All the waste water produced, essentially consisting of sanitary waste water is purified in the sewage plant, which is operated by Freudenberg Service KG. The four-stage process used also eliminates nitrogen compounds, which may contribute towards eutrophication of the surface water.

Dirty water and rainwater (surface drainage) on the site are passed into separate drainage systems. The rainwater is discharged into the river Weschnitz.

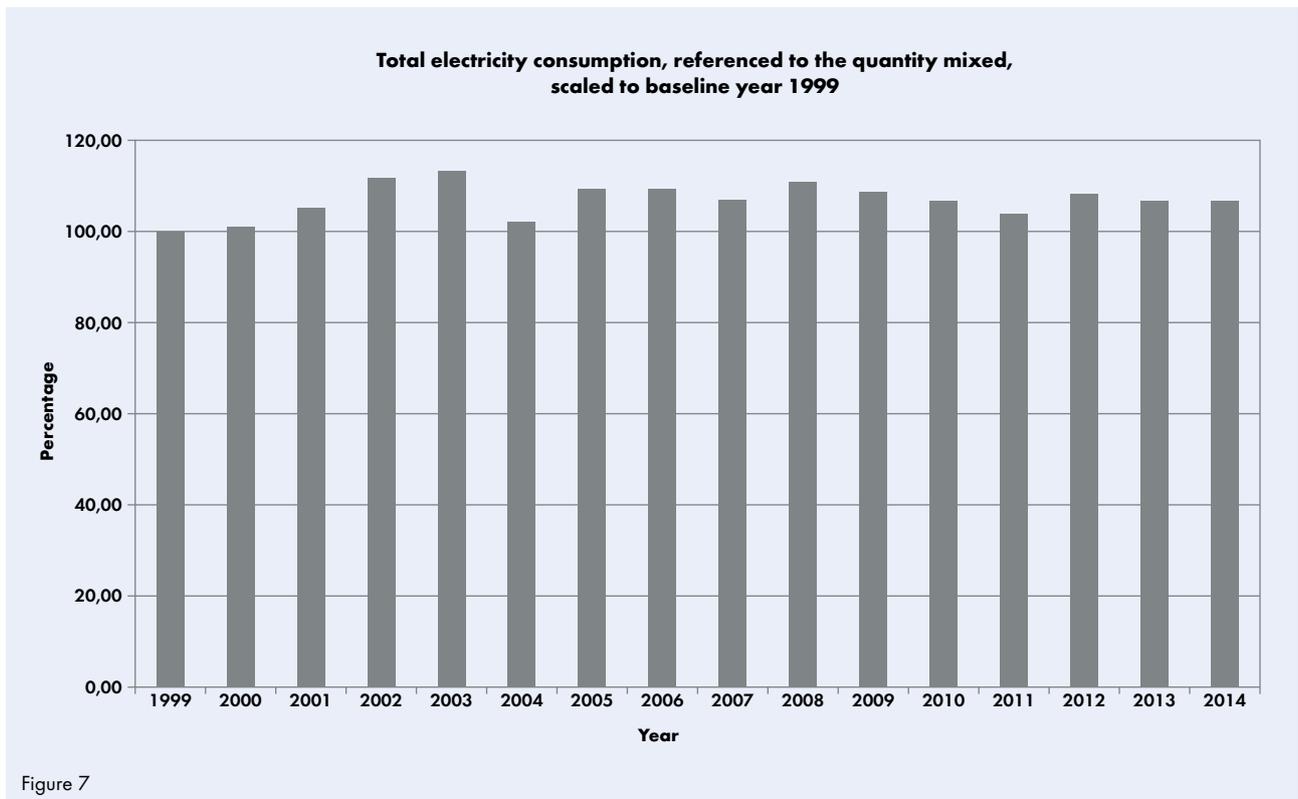
### 3.3 Energy

nora systems GmbH is supplied with all forms of energy by the energy department of Freudenberg Service KG. Electricity and medium-pressure steam as the principal energy carriers for the

processes are generated from natural gas in a cogeneration power plant, located in the industrial park with an efficiency of about 85%, for maximised eco-compatibility.

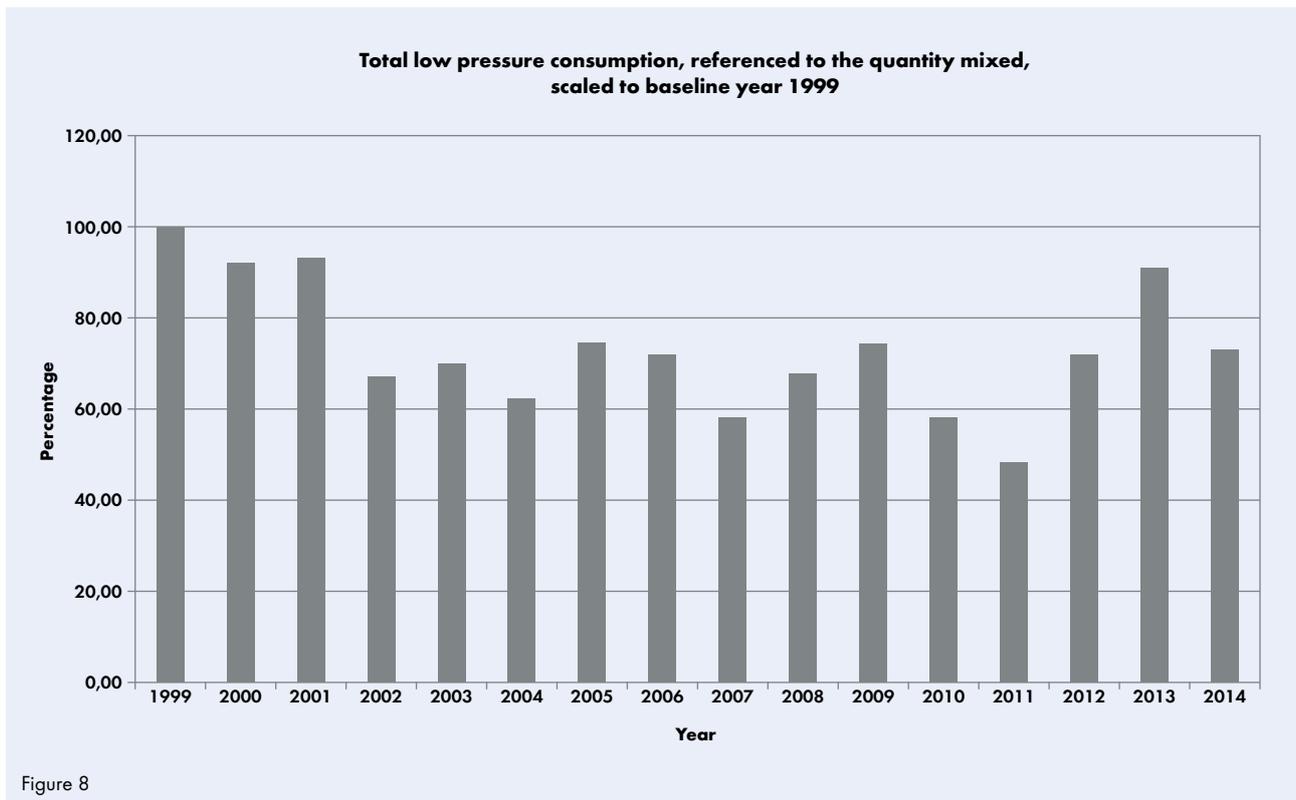
#### 3.3.1 Electricity

The following diagram depicts the consumption of electricity in kWh per tonne of quantity mixed. Like the procedure for water, 1999 is chosen as the baseline year, and 100% for the consumption.



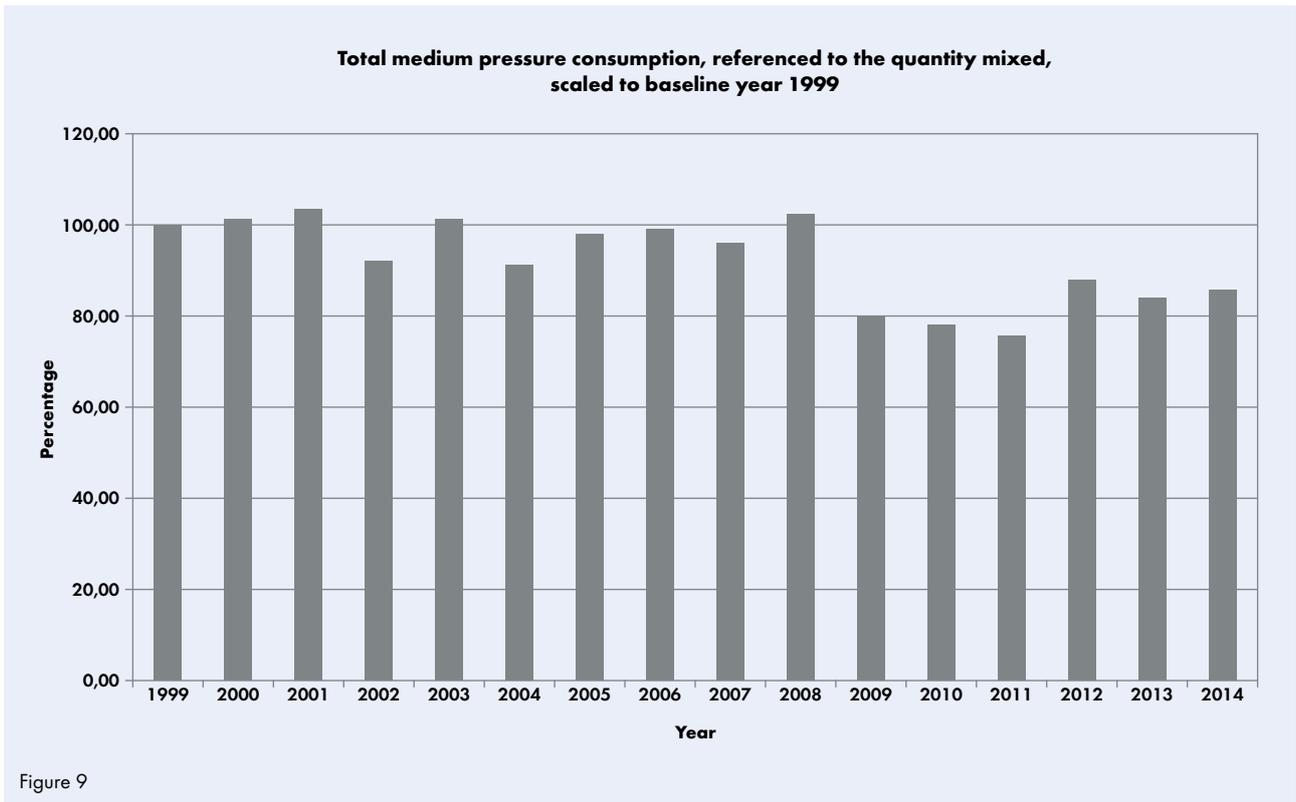
Recent years have seen only little fluctuation in the consumption of electricity. The differences are essentially caused by the utilisation of machine capacity over the year.

### 3.3.2 Low-pressure steam



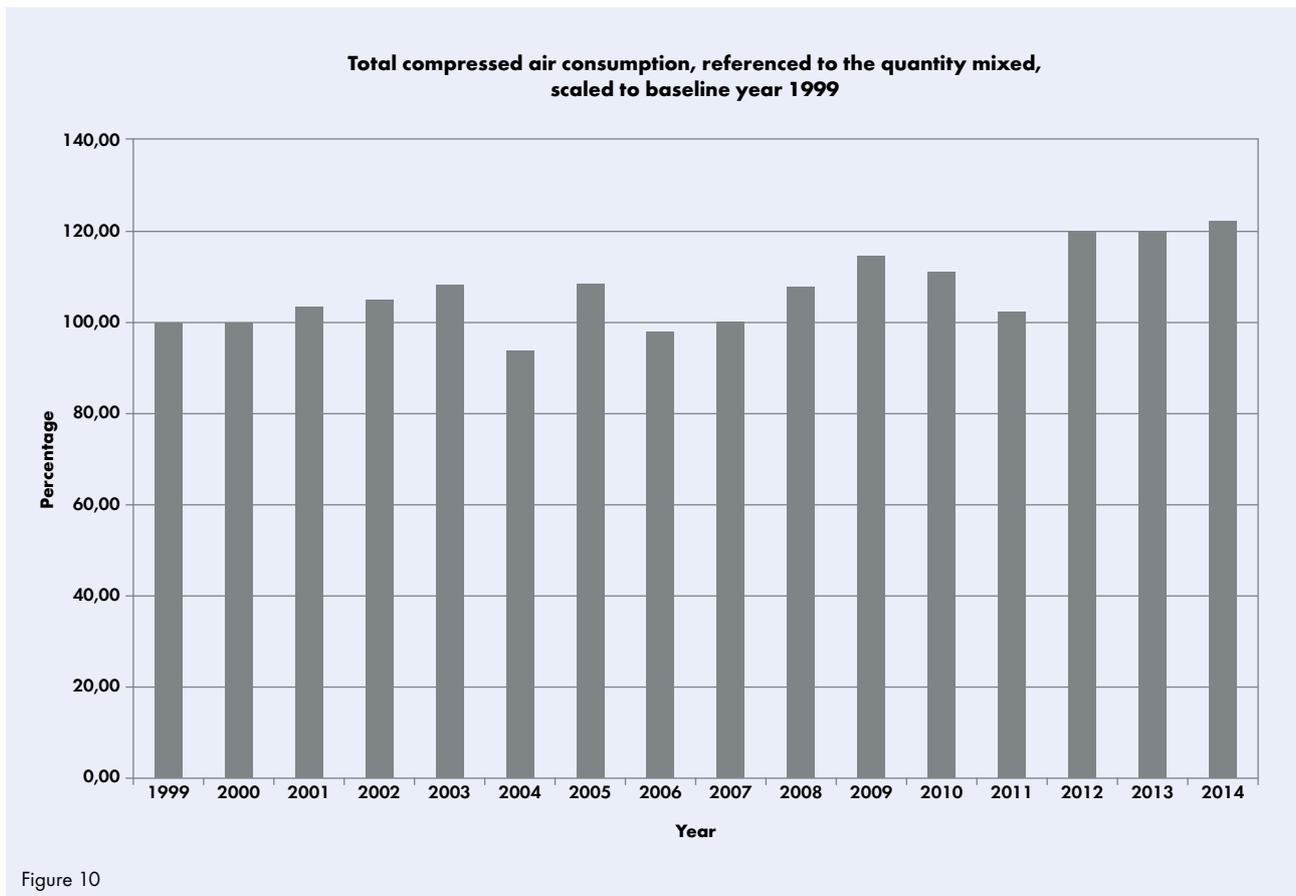
The favourable weather conditions caused a considerable drop in the consumption of low pressure steam in 2014 (essentially for heating purposes).

### 3.3.3 Medium-pressure steam



Medium pressure steam as the energy carrier for the vulcanisation processes is generated with high efficiency at the Freudenberg Service KG power plant.

### 3.3.4 Compressed air

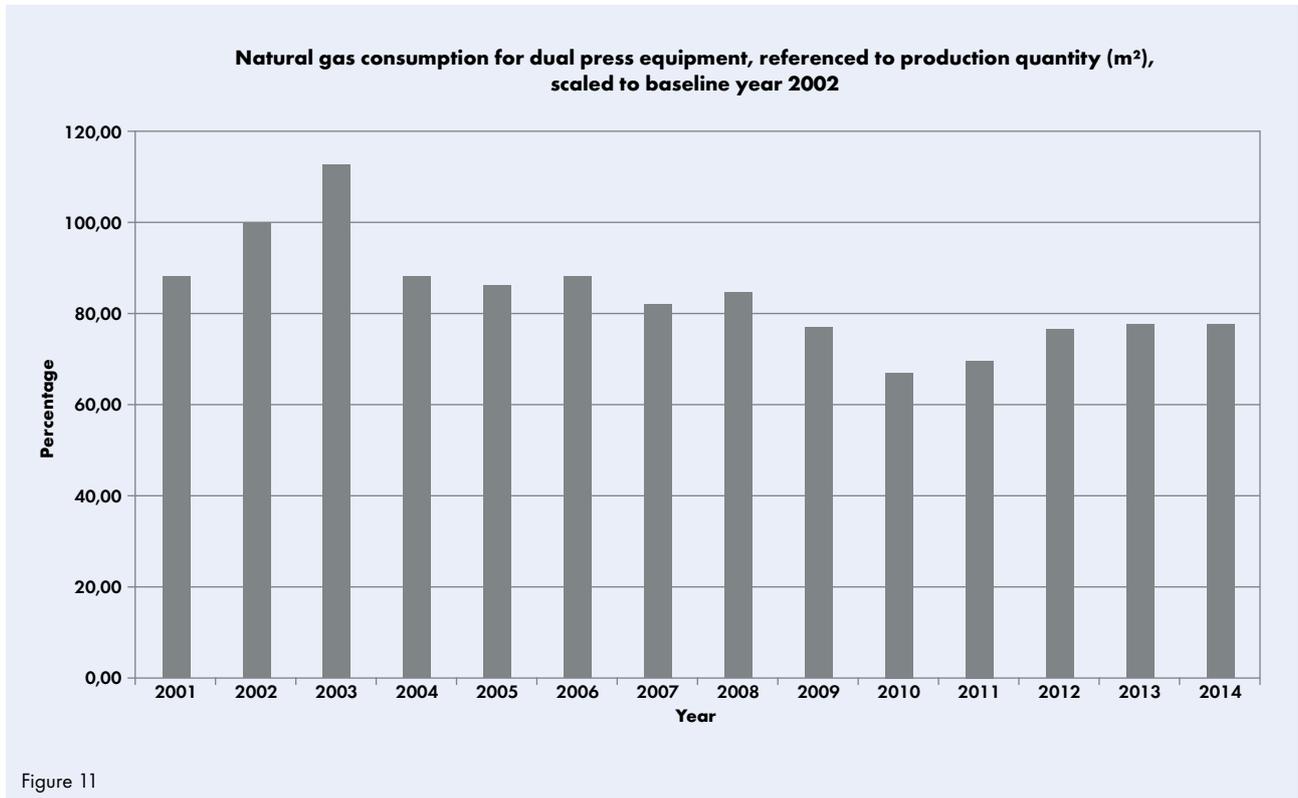


The compressed air for all main parts of the production line is also provided centrally from Freudenberg Service KG. In substance it is used for the machine control and for re-blowing of particle filters.

### 3.3.5 Natural gas

In 2001 and 2002 new continuous equipment for the manufacturing of roll goods has been installed. The necessary process heat is generated directly on-site by a fire tube boiler fed by natural gas. The quantity produced on this line was increased since 2004, so that improved energy consumption is visible because of a better usage rate.

In contrast to the above specified consumptions, the natural gas consumption in kWh is referenced per production quantity in m<sup>2</sup> at the twin-belt press (VM 6). The year 2002 is chosen as reference year and equals 100%.



### 3.4 Emissions of volatile substances

Due to measure-values of an emission register from 2010 and single measurements on lines over the years (V 6), the exhaust air loading per hour production can be calculated:

Volatile substances as total carbon 4 kg/h corresponds to 0.7 kg per ton of quantity mixed

The total figure stated for overall emissions from production is accounted for by measured emissions (guided air flows) and by diffuse emissions (estimated).

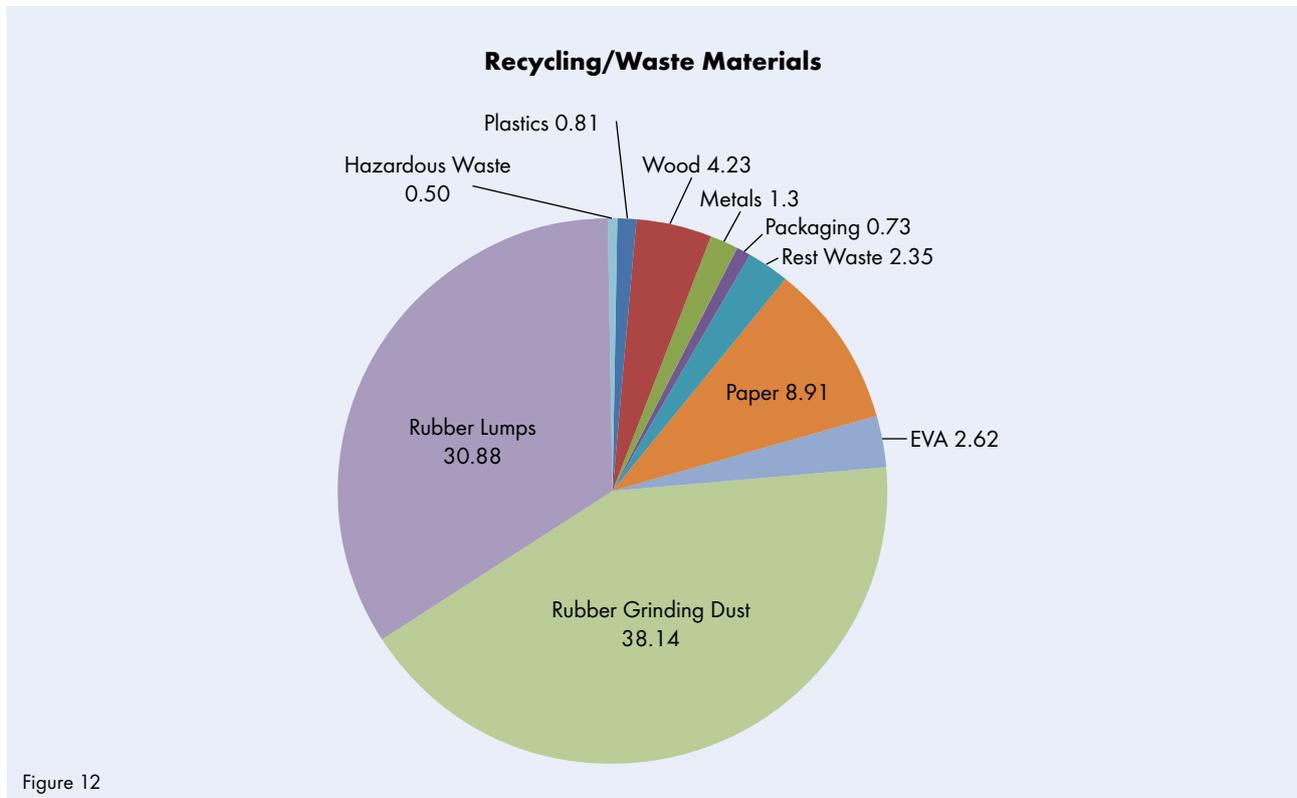
There is no legal obligation for the investigation of an emission register of the production line. Voluntarily this is expanded as needed, so that newly installed equipment is also regarded.

Noise emissions are likewise recorded in a noise register as needed (most recently in 2005). Within the production operation, there are noise areas designated in accordance with the occupational safety guidelines. An action plan for reducing the noise levels in these areas is in place. Substantial successes have been achieved by replacing loud machines and by technical measures such as enclosures.

## 3.5 Reusable material management system

### 3.5.1 Reusable materials and wastes

Details of the occurring material substance amounts (%) can be found in the table below:



Since 2008, all useful materials have been sorted and collected so that they can be resold afterwards wherever possible and thus returned to the resource cycle.

With 69%, the rubbers resulting from floor coverings have the largest share in the total waste. The essential fractions are contributed by piece goods and grinding dust generated by production processes. Some of the rubber residue is sold directly for material recycling purposes, and the remainder is introduced as fuel e. g. to cement works. There, the fine-grain silicone oxides - which make up approx. 50% of the floor covering - are released by burning the rubber. They form an ideal raw material for the Portland cement produced there. This means that the rubber residues are recycled both thermally and as material.

Further collected fractions are paper and cardboard packagings, timber, plastics and metals. This reusable waste is collected and stored as mono-fraction materials that can then be sold to the corresponding industrial enterprises.

The percentage of the total substance recycling amounts to nearly 100%.

The small quantities of residue materials (e.g. residual waste) are utilised for generating heat or electrical energy at incineration plants.

The above chart does not include paper used in the office areas. This is collected centrally by an office cleaning service provider who introduces it to recycling.

# 4 ECO- AND ENERGY-PROGRAMMES

## 4.1 The environmental goals up to the year 2015

The following environmental goals have been set down with effect from 2015:

<b>No.</b>	<b>Environmental goal</b>	<b>Planned improvements with required measures</b>	<b>Time/responsibility</b>
<b>1</b>	1% increase per year to the raw material yield	Analysis of losses over the entire production stream Definition and implementation of measures	By the end of 2015 Responsible: Head of Technical Engineering
<b>2</b>	Development of new floor coverings	Less use of hazardous substances in the product Lower emission levels from the production process Less product emissions over the service life	By the end of 2015 Responsible: Head of Development
<b>3</b>	Introduction of an energy management	Investigations into the benefits of an energy management system System setup Audits by an approved organisation	By the end of 2015 Responsible: Head of Engineering

Table 2: Environmental goals in 2015

The goal defined under 3 is described in detail below.

## 4.2 Energy goals up to the year 2016

The following energy goals have been set down with effect from 2016:

<b>No.</b>	<b>Energy goal</b>	<b>Planned improvements with required measures</b>	<b>Time/responsibility</b>
<b>1</b>	Establishing the energy management system among all nora stuff	Appointment of Energy Officers Active Communication of energy goals Action plans	By the end of 2016 Responsible: Management
<b>2</b>	Improvement of key EnPIs	Define measures, and pursue with approach  Integration in corporate suggestion scheme	Continuous Overall responsibility: Management  Area related: Heads of areas

Table 3: Energy goals in 2016

## 5 ENVIRONMENTAL PRODUCT DECLARATIONS

In mid-2010, nora systems GmbH began drafting environmental product declarations for its leading norament® and noraplan® floor coverings (norament® 926 and noraplan® 913 formulations). Usually referred to as EPDs, these comprehensive descriptions covering the entire lifecycle of the products from the production of the raw materials through to disposal of the products were published at the beginning of 2011. Based on a full ecobalance (LCA) "from the cradle to the grave", they were calculated by PE INTERNATIONAL (thinkstep since 2015) in Stuttgart.

The declarations serve the interested public domain in providing special information on the environmental qualities of the products and they aid construction planners in drawing up building performance audits.

The environmental product declarations under the new standard EN 15804 were again drawn up in 2013 and published in November. They are valid until 2018.

Both of these declarations are available in German and English on the website of the Institute Construction and Environment (IBU) at the following links:

<http://bau-umwelt.de/hp1/Institut-Bauen-und-Umwelt-e-V.htm>

<http://epd-online.com/>

## 6 CONTACT DATA

As part of its responsibility for the environment, nora systems GmbH maintains a dialogue with the public domain. For further information, queries and suggestions please send an email to the following contact address. Your inquiry will then be passed on to the appropriate specialised department.

nora systems GmbH  
Höhnerweg 2-4  
69469 Weinheim

e-mail: [info@nora.com](mailto:info@nora.com)  
[www.nora.com](http://www.nora.com)  
Phone: +49 (0) 6201- 80 56 66

# 7 CERTIFICATE FROM THE DEUTSCHE GESELLSCHAFT ZUR ZERTIFIZIERUNG VON MANAGEMENTSYSTEMEN (DQS) - ENVIRONMENTAL-MANAGEMENT SYSTEM ACCORDING TO DIN EN 14 001



## CERTIFICATE



This is to certify that

### nora systems GmbH

Höhnerweg 2-4  
69469 Weinheim  
Germany

has implemented and maintains an **Environmental Management System**.

**Scope:**

Manufacture, sales and marketing of floor covering systems and shoe components

Through an audit, documented in a report, it was verified that the management system fulfills the requirements of the following standard:

### ISO 14001 : 2004 + Cor 1 : 2009

Certificate registration no.	053195 UM
Valid from	2015-08-17
Valid until	2018-06-29
Date of certification	2015-08-17



### DQS GmbH

*G. Bleichschmidt*

Götz Bleichschmidt  
Managing Director



Accredited Body: DQS GmbH, August-Schanz-Straße 21, 60433 Frankfurt am Main

# 8 CERTIFICATE FROM THE DEUTSCHE GESELLSCHAFT ZUR ZERTIFIZIERUNG VON MANAGEMENTSYSTEMEN (DQS) - ENERGY MANAGEMENT SYSTEM ACCORDING TO DIN EN ISO 50001

  	<h2>CERTIFICATE</h2>												
	<p>This is to certify that</p>												
	<p><b>nora systems GmbH</b></p>												
	<p>Höhnerweg 2-4 69469 Weinheim Germany</p>												
	<p>has implemented and maintains an <b>Energy Management System</b>.</p>												
	<p>Scope: Manufacture, sales and marketing of floor covering systems and shoe components</p>												
	<p>Through an audit, documented in a report, it was verified that the management system fulfills the requirements of the following standard:</p>												
	<p><b>ISO 50001 : 2011</b></p>												
	<table><tr><td>Certificate registration no.</td><td>053195 EMSI</td></tr><tr><td>Date of original certification</td><td>2015-10-13</td></tr><tr><td>Valid from</td><td>2015-10-13</td></tr><tr><td>Valid until</td><td>2018-10-12</td></tr><tr><td>Date of certification</td><td>2015-10-13</td></tr></table>	Certificate registration no.	053195 EMSI	Date of original certification	2015-10-13	Valid from	2015-10-13	Valid until	2018-10-12	Date of certification	2015-10-13		
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Valid until	2018-10-12												
Date of certification	2015-10-13												
<p><b>DAKkS</b> Deutsche Akkreditierungsstelle D-ZM-16074-01-00</p>													
<p><b>DQS GmbH</b></p> <p><i>G. Blechschmidt</i></p> <p>Gotz Blechschmidt Managing Director</p>													
<p>Accredited Body: DQS GmbH, August-Schanz-Straße 21, 60433 Frankfurt am Main</p>													

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