Group Environmental Report 2004

BE › THINK › INNOVATE ›

GRUNDFOS

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The President's Statement

Jens Jørgen Madsen, Group President

Since 1996, when Grundfos published its first Group Environmental Report, our efforts to reduce the environmental impact have led to significant improvements.

However, the more successful Grundfos is in reducing the environmental impact, the greater the challenge becomes to invent new methods for achieving further improvements – and this calls for innovative action within the environmental sphere.

One example of Grundfos' cooperation with external research centres on new technological advances is the "Bioteks" research project. The purpose of the project is to be able to reuse the water used in washing systems in production plants several more times than has been possible so far, and the first results are promising.

As regards the working environment, our primary focus has been on safety and health. During the past 4 years we have been able to almost halve the number of accidents at work, and in 1 year, we have been able to remove almost 1 in 5 chemicals which negatively affects the working environment, and intensive work is undertaken to achieve further improvements in both fields.

Grundfos' environmental initiatives go beyond the activities and processes involved in manufacturing Grundfos' products; they also concern the time during which the pump is in operation at the customer's premises. Due to the energy consumption, the pump's environmental impact is biggest during its service life, and consequently it is of great importance to the environment when we succeed in reducing the energy consumption.

Several years ago we initiated a targeted effort to establish a pan-European energy labelling scheme of circulator pumps used in heating systems. This project has now been launched, and consumers can now choose a circulator pump according to its energy consumption in a manner that is just as simple and straightforward as the schemes used for energy labelling of refrigerators and other types of white goods.

Very few house owners realise that the circulator pump in their heating system may consume much more energy than their refrigerator. We expect that this energy labelling scheme will make a significant number of consumers choose pumps with a low energy consumption – thus achieving significant energy savings benefitting both the environment and their own financial situation.

Also in 2004 our employees have identified areas of improvement within the environmental field. This reflects their dedication, which is essential if we, as a company, is to meet our objective of being a responsible company.

This report describes activities and results that characterise 2004 as regards the environment and working environment.

I hope you will enjoy reading the report!

Jens Jørgen Madsen
Group President

LEADERSHIP

LEADERSHIP

Values and vision

Our key values are crucial for Grundfos' leadership. They are, in short:

- Responsibility
- Foresight
- Innovation

It is our vision that:

- The company's customers consider Grundfos to be the leading manufacturer and business partner for top quality pumps – in terms of functionality as well as environmental friendliness.
- There is a high degree of employee satisfaction, as the jobs and terms of employment provide opportunities for personal development, and that the working environment is characterised by consideration for the individual employee's aspirations and qualifications.
- Society at large holds Grundfos in high esteem and recognises the Group for its strict adherence to legal requirements and its respect for democratic principles, local traditions and the environment, as well as the people whose lives and conditions are affected.

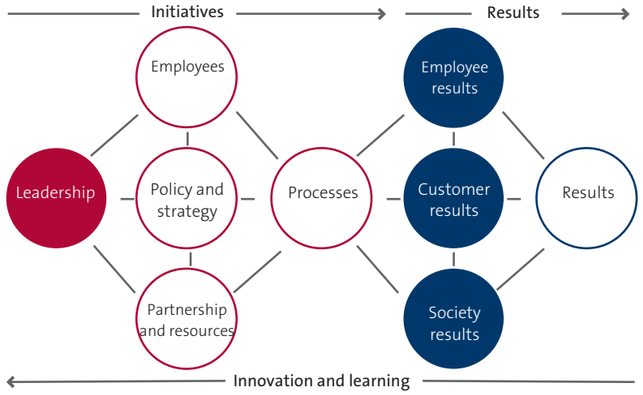
Group values and our mission, vision and general policies are described in detail at www.grundfos.com/values

The Business Excellence management model

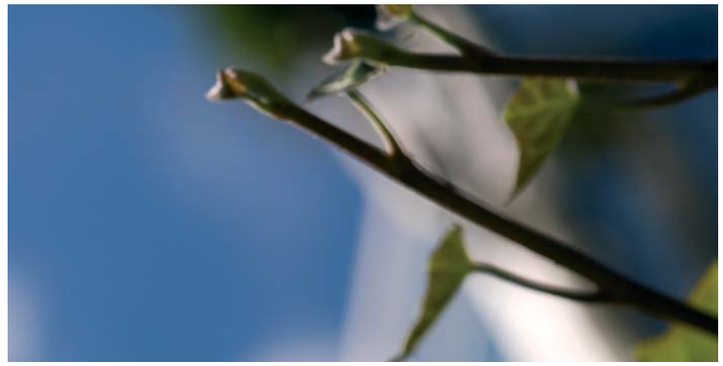
Our organisation is based on values, and therefore we do not wish to set up more rules than absolutely necessary.

Figure 1

Business Excellence Model



The structure of the Group Environmental Report is based on the Business Excellence model. Initiatives are based on leadership, while results are based on employees, customers and the society.



However, it is important to use a set of common tools when working towards a common goal.

We have chosen the Business Excellence model as our general management model, and it is therefore natural to also use this model when preparing our environmental report. The main categories are leadership, employees, customers and society.

(Figure 1: The Business Excellence model).
The Business Excellence model links efforts and results; and learning based on results achieved is an important input in the decision-making process for new strategies, objectives and action plans.

We wish to take a holistic approach to sustainability, and we therefore take social, environmental and financial aspects into consideration. This report describes our efforts and results within the field of environment.

Environmental responsibility

The Group's general environmental objectives cover the company's general environmental impact, working environment and the products' environmental impact. These objectives are fixed once annually and are based on a review of past years' results, audit results and input from the Group's environmental organisation. (Figure 2: Environmental objectives).

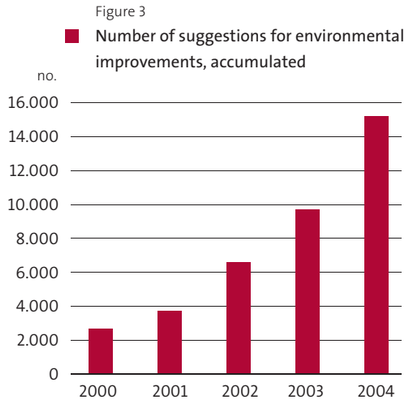
Environmental managers from the production companies meet every other year – most recently in 2003 – to jointly prepare a memorandum to the Group Management describing environmental focus areas to be given top priority in the years to come, including areas for which all production companies must set objectives. As a result of differences in procedures, physical conditions and local legislation, the companies also define individual objectives in other target areas.

Figure 2

Environmental objectives

	Subobjective 2004	Result 2004	Objective 2005
Employees			
Accident frequency	Reduce to 19.0 accidents per 1 m working hours	17.9	17.0
Accident-related absence	Reduce to 2.0 hours per 1,000 working hours	1.8	1.7
No. of red chemicals	Reduce to 95 pcs.	82	77
Customers			
Electricity consumption, new products	80% of new products must as a minimum show a 5% reduction in electricity consumption than the previous model.If the previous model is less than 5 years old, the electricity consumption must be reduced by at least 2 per cent.	3 in 4 products	Same as in 2004
Material consumption of new products	New products must have a smaller consumption of resources than previous model	2 in 4 products	Same as in 2004
Society			
Indexed electricity consumption	Reduce to index 83	90	87
Indexed water consumption	Reduce to index 91	99	97
Indexed chemical waste	Reduce to index 85	71	66
Transport, load ratio	Increase to 85%	91%	–

Figure 3



Objectives have not been set for the number of suggestions for environmental improvements. Thus, the result has not been made by "forcing" it through, but as a result of the employees' wish to make a difference.

One example is that safety is generally given high priority throughout the Group. The American production company, however, attaches particular importance to safety. Following an enormous effort to prevent accidents at work, the American company has reduced its accident frequency from 25 in 2002 to 6 in 2004.

In the Danish production company wastewater treatment is given very high priority – partly because of national legislation, and partly because of the composition of the wastewater. As a result, a new purification method, based on biological purification, is currently being introduced.

Employee involvement

Based on the objectives, local area management adopts action plans that help meet the objectives. It should be appreciated, however, that employees have taken up the invitation to get actively involved by providing suggestions for improvements.

The number of suggestions have become a benchmark in its own right expressing the employees' involvement in their own company. The high number of suggestions is a symbol of Grundfos' tradition to involve its employees and give them co-responsibility. (Figure 3: Number of suggestions for environmental improvements).

Co-responsibility is also the key word for the way we organise our efforts to improve the environment and working environment. We very often set up cross-organisational working groups that focus on a particular subject, e.g. chemistry or noise.

The purpose of the working groups is to achieve a high degree of experience sharing across the company. Prioritised and structured experience sharing is an important part of the work to disseminate and implement management systems, policies and procedures throughout the organisation. Experience sharing is also conducted via a cross-organisational system for environmental and working environment audits.

Responsible globalisation

Grundfos has production companies in 9 countries across the world. In addition, Grundfos owns a number of companies which are operated under their original name, and thus not adopted in the Grundfos family like the other companies.

All production companies carrying the Grundfos name must be certified according to ISO 14001, the international standard for environmental management. This requirement is part of our Group environmental policy and all companies already comply. The most recent production company in the Grundfos family is situated in Hungary and was granted the ISO 14001 certification in 2004. In addition, several production companies have chosen to become certified according to the OHSAS 18001 occupational health and safety standard.

Production companies in the Group that do not carry the Grundfos name are also subject to requirements. They are not required to have a certified environmental management system but must comply with a number of internally defined minimum requirements to environment, health and safety. The system used to evaluate the companies that do not carry the Grundfos name is identical to the one we use to evaluate our suppliers. In addition, these companies have been included in the Group audit plan for environment and health and safety, and the first audit of these companies were performed in the autumn of 2004.

Grundfos and its interested parties

The parties that are most important in our efforts to achieve sustainable development are our employees, customers and society at large. In accordance with the classification of the Business Excellence model we have decided to describe our efforts and results as regards sustainability based on these 3 main groups.

The following sections describe target areas that are given specific priority in order to achieve social, environmental and financial sustainability in relation to employees, custo-

EMPLOYEES

Employee satisfaction

Every other year Grundfos conducts a Group survey of employee satisfaction. For the first time, at the beginning of 2004, we conducted a satisfaction survey by posing the same basic questions in all Group companies.

The satisfaction survey gives us a sound basis for evaluating job satisfaction among employees, and the results of the survey will be valid until the next survey is performed at the beginning of 2006.

The questions posed fell within the following main categories:

- Myself
- My manager
- My team/my department
- My region
- My company

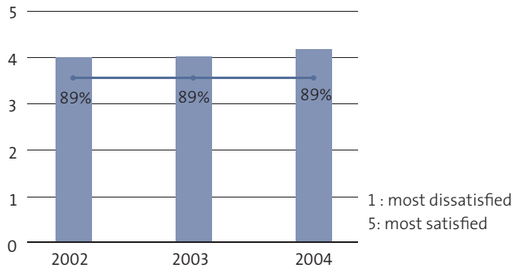
The percentage of returned questionnaires from the Group's production companies ranged from 78% to 97%. Satisfaction was measured on a scale from 1-5, with 5 being the highest. In general, satisfaction was high, however with a relatively large spread between the individual companies from 3.1 to 4.2, and with an average of 4.1 (Figure 4: Employee satisfaction).

At Group level, innovation was identified as the most important focus area based on the results for a group of questions that all concerned innovation. Innovation is the foundation of the company, and it is important that we all – managers and employees alike – work actively to ensure that innovation pervades everything we do in relation to our colleagues.

Working environment

As regards the employees, environmental sustainability should centre on initiatives and results within the areas of working environment and safety. Grundfos has decided to

Figure 4



* As from 2004, the survey will be conducted every other year – the next time in 2006.

Figure 5

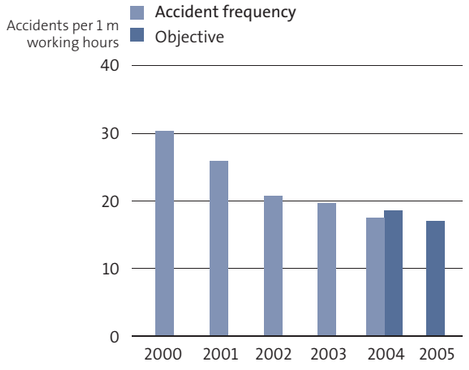


Figure 6

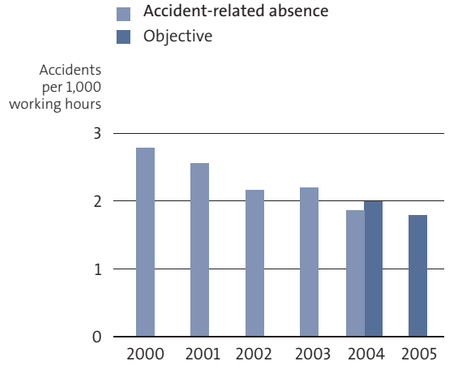
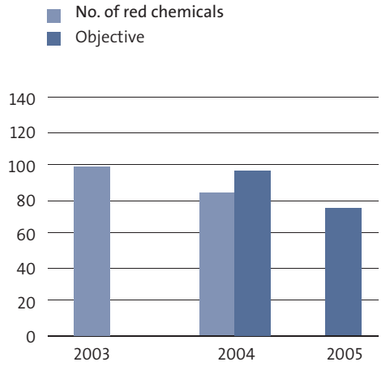
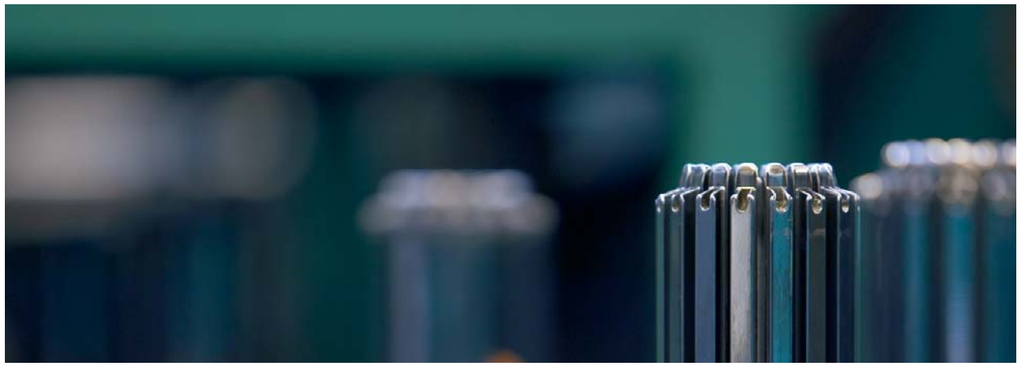


Figure 7





EMPLOYEES

focus on a few essential areas. We are convinced this is how we will achieve the best results.

Prevention of accidents at work

Following an unfortunate Group record in 2000 with an accident frequency of 30.3 per 1 million working hours, the number of accidents at work was singled out as the Group's number one priority for 2001. The initiatives launched at that time have contributed to the steady drop in the accident frequency recorded in 2004.

The initiatives mainly consisted of a system for proper follow-up on accidents that had already happened and the subsequent implementation of corrective action to avoid reoccurrence. An important part of the process consisted in reporting each accident at work to both the company's top management and the local production management, who are responsible for following up on the accident.

Recording of near-accidents

If we are to successfully reduce the number of accident-related absence, we need to reduce the number of "near-accidents". That is why we record such incidents and follow up on them using the same serious approach as with actual accidents.

Thus, it should not be considered negative that an increasing number of "near-accidents" are being recorded. This should merely be taken as a sign that our ability to identify potentially dangerous situations, which may develop into accidents, is increasing.

We are convinced that our increased focus on accident prevention once again has caused a drop in the accident frequency at Group level. (Figures 5-6: Accident frequency and accident-related absence).

It is not only important to prevent accidents from occurring at the workplace; it is similarly important to prevent accidents from occurring in the home or on the way to or from work. The German production company has launched an initiative to improve safety within this area: All interesed employees are offered to participate in a course for improved driving skills for drivers of motorbikes and cars. In 2004, the Danish companies focused on road safety, launching an in-house campaign and a course in cooperation with the Danish Council for Improved Road Safety.

Production chemicals

During a number of years we have worked hard to reduce the number of chemicals used in production. This work continues, and since 2003 we have focused on reducing the most harmful chemicals.

To this end, we have created our own basic classification of chemicals consisting of a red, a yellow and a green group. The most harmful substances are classified as red, while the least harmful ones are classified as green.

The classification is based on the European labelling rules, as no universal labelling rules exist. Chemicals used in non-European companies have been classified in the same way on the basis of the relevant safety data sheets. (Figure 7: The number of red chemicals used in production).

Following classification of all chemicals in the Grundfos production companies, we are now able to rapidly identify the most problematic chemicals from a health and safety point of view.

Chromium, for example, is an unwanted chemical – both in relation to the environment and the working environment. Therefore, the production company in Taiwan worked for almost a year to find a replacement for a substance containing chromium, which was used in a cataphoresis process for surface treatments.

Once a product was identified that was technically able to replace the chemical, more advantages presented themselves than initially anticipated: While improving the environment and the working environment, wastewater treatment resulted in less water containing heavy metals, thus reducing the costs for disposal of sludge by 57 per cent.

CUSTOMERS

Sustainable partnerships

At a time when globalisation and the establishment of production create business relations across countries with different norms, cultures and standards, it is a great challenge to achieve sustainability in the chain of suppliers. We find it essential to work with sustainable suppliers, as this serves as a guarantee to our customers that we sell sustainable products – both that part of the product which has been produced by Grundfos and the part that has been produced by subsuppliers.

Suppliers and the environment

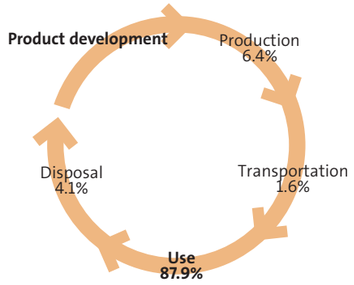
We wish to work with suppliers who have high ethical standards and who look after the environment and the working environment. Therefore, we have set up a system for evaluating environment and working environment issues at the suppliers' premises. We use a questionnaire in which the suppliers evaluate themselves by answering the questions. Based on this self-evaluation we estimate whether the supplier needs to launch initiatives to improve, and whether the evaluation must be followed up by a visit and/or an audit.

Irrespective of whether Grundfos' pumps are used for obtaining, moving, treating or disposing of water, it is not possible to achieve sustainability without engaging in close cooperation with the customers. Unintended use of a pump leads to lower performance, and in the worst case it may cause damage to equipment and injury to people. And if the pump is not correctly installed, it may lead to waste of valuable drinking water, discharge of harmful substances or an unnecessary high electricity consumption.

Figure 8

The life cycle circle

% environmental impact



The 2 most important times of the products' life cycles are:

- the product development phase, where the focus is constantly on creating a product with the smallest possible environmental impact
- the pump's service life, during which the main environmental impact occurs

In order to increase the customers' knowledge and awareness when choosing and using Grundfos' products, the Group's sales companies offer training of the customers on an ongoing basis. Grundfos' team of sales people complete extensive training programmes to keep up-to-date with pump technology and to improve their skills in assessing and understanding the various contexts of which the pumps will form part. Thus, they are able to offer individual guidance based on the customer's situation.

Product-related environmental factors

It is estimated that approx. 1-2 per cent of the world's electricity consumption is used for operating Grundfos pumps. This assessment is based on a survey made by, among others, EuroPump, a European trade organisation, which estimates the proportion of the world's total electricity consumption that is used for operating pump systems. Taken together with an estimate of Grundfos' share of the pump market, the result is the above-mentioned 1-2 per cent of the world's electricity consumption.

Thus, there is a sound reason to focus on the energy consumption in the pumps we produce. The importance of this issue is further underlined by the fact that by far the largest environmental impact from a pump comes from the energy consumption in the pump's service life, and this environmental issue is of great significance to the customer.

Product life cycle

Once the pump's life cycle has been estimated, it becomes clear which environmental issues are most important. The calculation of the life cycle of a pump serves to demonstrate how much better a new version of a pump is compared with the older models in terms of environmental load.

Life cycle calculations show that a pump's main environmental strain is caused by its electricity consumption during its service life.

The life cycle of a Grundfos pump consists of the following stages:

- Product development
- Production
- Transportation
- Use
- Disposal.

(Figure 8: Life cycle circle).

Figure 9

Electricity consumption of new products compared with the previous model

Product	Improvement attained as regards energy efficiency	Explanation
MeCR	18.5%	Optimisation of hydraulic design
MG100	0.8%	Loss reduction in the motor
Inline TP Large	22.6%	Optimisation of hydraulic design + energy-efficient motor as standard
Magna	28.0%	Use of permanent magnet technology in the motor
AP 11kW	new pump types, thus no immediately	
Dosing DME3	comparable Grundfos products	
TP series 400		

The improvement of energy efficiency is measured in per cent in relation to the previous model of the same type of Grundfos pump (motor as regards MG100).

The percentages indicated in the figure serve only as an example from one of the products that were released for sale in 2004 – they do, however, reflect the overall situation.

A pump's energy consumption is primarily determined in the development phase, as this is the stage at which the electricity effect of the pump, i.e. pump performance in relation to amount of electricity consumed, is determined.

Therefore, Grundfos has defined an objective in this regard: "At least 80 per cent of new products developed up until 2006 must have an electricity consumption that is 5 per cent less than the previous model, as a minimum. If the previous model is less than 5 years old, the electricity consumption must be reduced by at least 2 per cent." (See Figure 9, showing the results achieved for pumps introduced on the market in 2004).

Energy efficiency has been improved for the products shown in the table, Figure 9. The reasons behind the results achieved are also described in the table. Only the MG100 has failed to achieve the specified improvements. The MG100 series may be divided into a series of highly efficient motors and a series of less efficient motors. The latter will be phased out as highly efficient motors will, to an increasing extent, become the standard for most pump types.

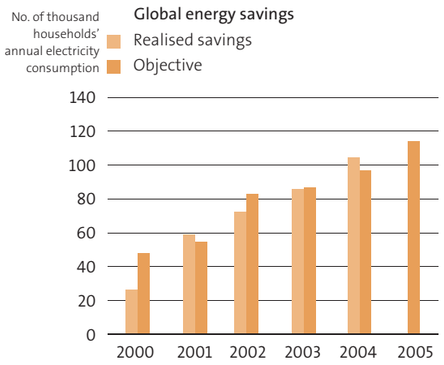
One thing is developing energy-efficient pumps, another one is realising the energy savings made possible by the improved electricity efficiency. We have followed up on our actual sales of energy-saving pumps, and against that background we have estimated the realised global energy saving per year for these pumps. (Figure 10: Global energy savings).

Material consumption

Consumption and the composition of materials influences a pump's environmental impact – also in relation to the customer. The most important questions to ask are the following:

- Does the pump consist of materials that are considered "scarce resources"?
- Can parts of the pump be recycled at the end of its service life?
- May pump materials release vapours that are harmful to health or environment when it is used?

Figur 10



The figure shows the estimated global energy savings caused by Grundfos' energy-saving pumps.

The estimate is based on actual sales figures for each year as well as assumptions of which previous models the sold pumps replace.

The estimate is calculated for savings measured in the annual electricity consumption of no. of thousands of households. It is estimated that an average household uses 4,500 kWh annually.

Figure 11

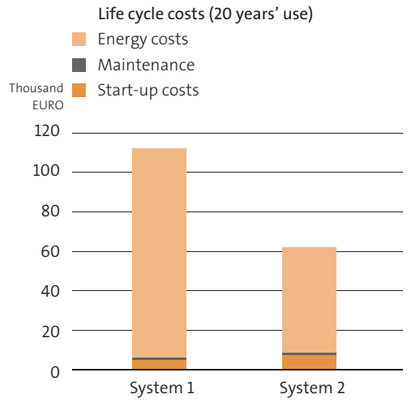
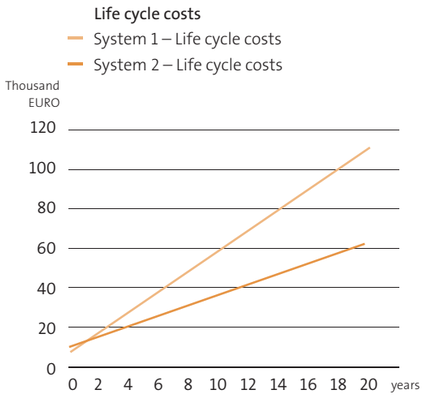


Figure 12



CUSTOMERS

CUSTOMERS

Grundfos has defined an objective for the reduction in material consumption. All new products developed between now and 2006 must consume fewer resources than the previous model.

As regards material composition, the following results have been obtained for new products introduced on the market in 2004:

MeCR: The amount of materials used in this pump has increased, as there has been a transition from using drawn stainless steel to using castings in order to reap the benefits involved in terms of quality and price. The increase in the amount of stainless stell is of no significant environmental importance.

MG100: The amount of materials has increased in this motor in order to achieve a higher efficiency (to reduce loss). In cases where the objectives of high energy-efficiency and a low consumption of resources conflict, the energy-efficiency objective is given the higher priority, as this objective has the greatest environmental significance because of the pump's energy consumption during its service life.

Inline TP Large: The material consumption has been reduced as it has been possible to reduce the pump size while at the same time delivering the same performance in terms of flow and head.

Magna: The changeover to permanent magnets has allowed for a down-scaling of this product. As a result, the amount of materials in this product has been reduced.

Life Cycle Cost

It is essential for the customer to know whether the pump he is buying is expensive or inexpensive. However, in this connection, the purchase price is not the only thing that counts. Focus should be on the total cost of the pump's entire life cycle, i.e. costs that arise in connection with the pump from purchase, installation and operation to maintenance and disposal.

It is only possible to gain a real impression of how expensive or inexpensive the pump is by taking all stages into account. A method has been established to calculate such costs, namely the "Life Cycle Cost", which has been developed in cooperation between the Hydraulic Institute, EuroPump and the US Department of Energy's Office of Industrial Technologies.

Based on the "Life Cycle Cost" method we have calculated a number of examples of how pumping tasks – depending on pump type – may be solved with different results in terms of total costs during the pump's working life. In general, the examples show that it pays to purchase a slightly more expensive pump which will, however, recover the extra expense in a relatively short time due to the low operational costs. This can be seen from the example below:

Case:
The task at hand: A 20-year-old pump station is due to be reconditioned, and the customer (a district heating station) wishes to focus on low operational costs. Pumping system specifications include the following: Heating of a total of 80,000 m^2, a heating requirement of a total of 6,000 kW, a flow of 129 m^3/h and a head of 18 m. At present, the pumping task is solved using 2 pumps: 1 pump with a constant bypass speed + 1 standby pump (operation alternating between the 2 pumps).

Possible solutions:
The Life Cycle Cost is calculated for the following 2 solutions:

- System 1 = 1 pump with a constant bypass speed + 1 standby pump (2 pumps type NK 80 250/259, 11 kW).
- System 2 = 2 adjustable pumps + 1 standby pump (3 pumps type TPE 80-240, 5.5 kW).

Result:
As can be seen from the bar chart, System 2 – with the adjustable pumps – is the more inexpensive choice based on the Life Cycle Cost model, although the purchase price is higher than for System 1. After approx. 1½ years the extra purchase cost for System 1 has been recovered due to the lower operational costs of System 2. (Figures 11-12: Life cycle costs and Overview of repayment time).

Facts about energy labellingæ

- In addition to Grundfos, who took the initiative to introduce the labelling scheme, participants include the Danish pump manufacturer Smedegaard, Wilo, Germany, and Circulating Pumps, the UK. In total, these companies cover approx. 80 per cent of the European market for circulator pumps.
- The labelling scheme consists of the classes A to G, where A stands for the most efficient and G for the least efficient circulator pumps. The traditional circulator pumps that are installed in most European homes belong to category D. They operate at the same speed all day regardless of the amount of heat used.
- The labelling scheme is similar to the EU labelling scheme for refrigerators and other white goods, and is based on the principles of the EU Commission's directives on the energy-labelling of electric bulbs.
- The scheme is a mutually binding agreement concluded between the 4 manufacturers. However, the initiative is open to those who wish to join the scheme.

NEW LABELLING OF PUMPS WILL SAVE ELECTRICITY AND SPARE THE ENVIRONMENT

A circulator pump used for water and heating consumes a large amount of electricity, and yet it is a very anonymous device. Very few house-owners realise that a traditional pump typically consumes far more energy than a refrigerator. And even fewer realise that far more energy-efficient pumps are available.

However, at Grundfos' initiative, an energy labelling scheme has now been established for circulator pumps. It will increase the awareness of the advantages involved in using more advanced pumps and increase the competition among manufacturers to develop more energy-efficient circulator pumps.

The EU rules about energy labelling have already influenced consumers' choice of white goods and electric bulbs. The philosophy behind the energy labelling scheme for circulator pumps is a similar one – to make the energy consumption visible, so that European house owners can use it as a guide when choosing circulator pumps.

The new energy labelling scheme will shift focus to pumps that work only when necessary and only with the required power. Pumps of this type will obtain the optimum category A energy label.

With a quantum leap in the development of energy-optimised circulator pumps, Grundfos will introduce a completely new pump for the heating season 2005, which has achieved an impressive A-classification. The annual power consumption of Grundfos Alpha Pro is as low as 90 kWh. In comparison a traditional circulator pump consumes 5-600 kWh a year.

Huge global environmental potential

A traditional circulator pump stands for approx. 15 per cent of the total electricity consumption in the average European household. As the labelling scheme clearly shows that the individual consumer may save electricity, it will be possible to achieve total energy savings on circulator pumps worth billions throughout Europe.

Circulator pumps are used in 120 million European households, using a total of 60 billion kWh annually. If all European households began using A-labelled circulator pumps, savings worth 48 billion kWh could be made annually, and CO_2 emissions could be reduced by 17.6 million tons.

Highly varying requirements and traditions for heating in the individual European countries have made it difficult to reach the calculation methods, which form the basis for the energy labelling. However, after 4 years – in March 2005 – a common EU labelling scheme was introduced.

Europump, the European trade organisation, owns the agreement and ensures that a committee comprising representatives for the signers and the EU comply with the agreement. As is the case with other energy-labelled products, consumer organisations may check whether companies comply with the scheme. In the event of serious breach of the agreement, a company may be excluded from the labelling scheme.

CUSTOMERS

OBJECTIVES

Common objectives have been set for all production companies within the following fields of environment:

- Electricity consumption
- Water consumption
- Chemical waste

(Figures 13-15: Electricity consumption, water consumption and chemical waste).

In addition, the Group has set a common benchmark for transportation.

Electricity

Electricity is used for various production purposes: ventilation, cooling, compressed air, operation of production equipment, lighting etc. It is very important to continue to reduce electricity consumption, as it impacts on the discharge of CO_2, and because reductions lead to savings. The electricity consumption result is stagnating, as work in this area has been undertaken for a number of years, and during that time considerable savings have been made. It is clear to us now that it will be difficult to make any further significant improvements in this area. (Figure 13: Indexed electricity consumption).

Water

Clean water is becoming an increasingly scarce resource, and water consumption has therefore been identified as an important environmental factor in all Grundfos production companies. The production companies use water to fill test tanks, wash metal items, and mix cooling/cutting fluid etc. (Figure 14: Indexed water consumption).

The indexed water consumption for production purposes has dropped dramatically in some companies as a result of dedicated efforts. In the Danish company, in particular, the amount of water used for production is now smaller than the consumption for sanitary purposes, i.e. canteen,

Figure 13

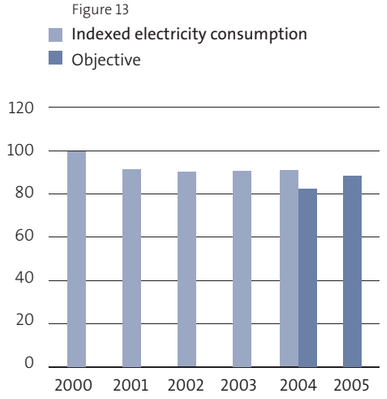


Figure 14

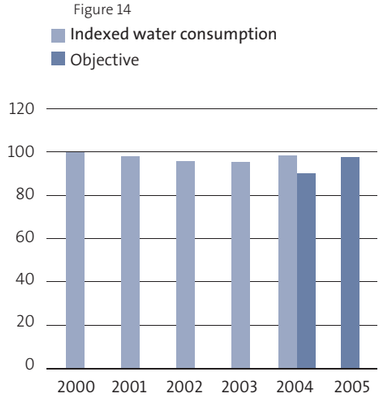


Figure 15

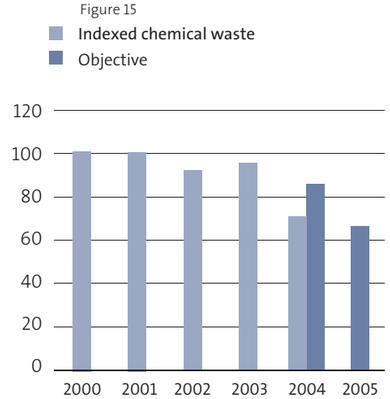
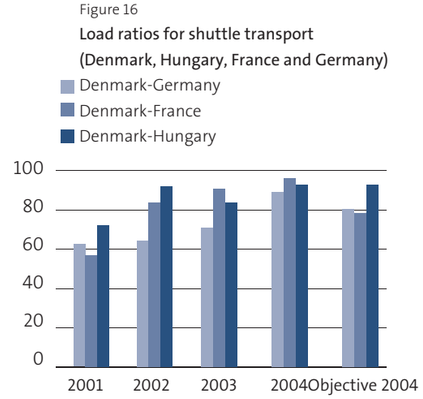
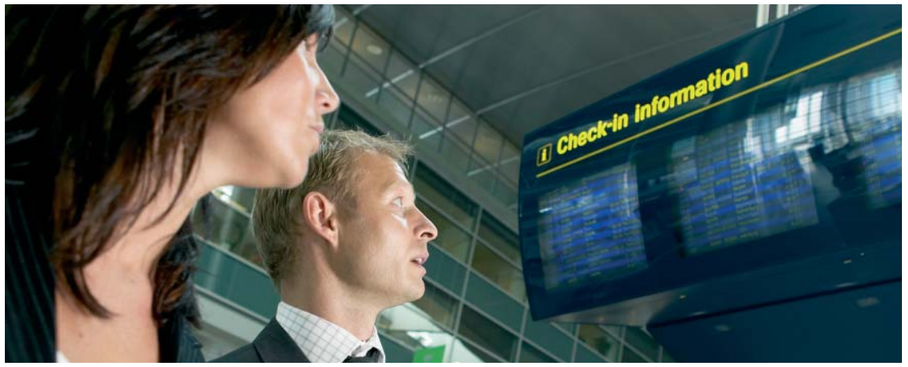


Figure 16





SOCIETY

showers, drinking water, lavatories etc. Consumption in the Danish company is approx. 76% for sanitary purposes and 24% for production.

The indexed water consumption has increased from 2003 to 2004. The increase is due to a higher water consumption in the Danish company. The water consumption amounts to approx. 43% of the total water consumption in the production companies.

The increase is partly due to the relocation of a considerable amount of equipment in connection with a large-scale project to improve the lead time of products in production. These activities have involved changes to piping, extra drainings of cooling and washing systems, sprinkler systems etc. In addition, the test area has been expanded, necessitating the installation of more cooling towers and test tanks. Next year, we expect water consumption to have stabilised again.

However, there are also good examples of savings made in water consumption in the Danish company. As a result of the "Bioteks" research project we have succeeded in extending the life time of water in a test tank at the Aalestrup factory. Previously it was necessary to change many cubic metres of water and pay dearly for transporting the wastewater for treatment at the municipal purification plant.

In cooperation with 4-5 other companies, the Danish Technological Institute and a university, Grundfos examined the reasons for growth of biofilm in water systems. It turned out that pollution and the growth of biofilm in the large test tank originated from washing metal blanks. The shape of the blanks allowed a small amount of oily water to remain inside them, and the water was moved from the washing system to the test tank. Equipment was subsequently installed to turn and shake off the water of each blank after each wash, resulting a considerable increase of the water's life in the test tank.

Chemical waste

Chemical waste consists of various solid and liquid waste that is mostly defined as hazardous waste, depending on the country of origin. Grundfos aims to provide comparable figures for chemical waste despite differences in local legislation in the countries in which our production companies are based.

The development of the result for chemical waste is very positive for the 2003 to 2004 period. This development is primarily due to the French company having installed an evaporator used for evaporating wastewater. Previously, the wastewater was treated like chemical waste. This initiative is a vast improvement, both environmentally and financially. (Figure 15: Indexed chemical waste).

At present, Grundfos is phasing out lead, which is hazardous to humans and impacts the environment when introduced in nature. Instead of lead, Grundfos has begun using leadfree solder in the electronics production.

Some of the components used by Grundfos at present cannot withstand the high temperatures required for soldering with leadfree tin, and extensive work is being performed to develop new processes and determine whether some products require redesigning.

In return, leadfree tin solderings are not only advantageous to the environment; they are stronger too, and have a longer life than traditional solderings.

Transportation

Since 2001, Grundfos has gathered environmental data for selected transportation routes that will be used to define objectives for ongoing environmental improvements.

We have gathered data about the regular routes between the Grundfos distribution centre in Denmark and the distribution centres in France, Germany and Hungary. By recording data about all shipments between distribution centres in the form of

- the weight of the consignment,
- its size in m^3,
- number of kilometres covered and type of truck (EURO norm)

we have been able to calculate a set of environmental ratios.

Objectives have been defined for the load ratio – i.e. the degree of utilisation of the space in a truck during transportation. We have decided to formulate the objective for this parameter, as this is the area in which Grundfos may primarily influence the environmental strain of the consignment. (Figure 16: Load ratios).

The objectives for 2004 have been met for all routes, as the load ratio is higher than the objective. We have achived this result by targeted transport planning on specified routes, thus achieving optimum utilisation of the room in the trucks.

Finance

Profit is not an objective in its own right, as far as environmental and health and safety improvements are concerned. It is nevertheless motivating to see that small and large environmental improvements have a major financial impact. Grundfos therefore wishes to measure the financial impact of our environmental and health and safety activities.

Calculations of the financial impact of environmental activities relating to the consumption of electricity, water and heating in production in the Group as a whole are shown below. (Figures 17-19).

Consumption of electricity, water and heating

We use relative, indexed figures and compare the resource consumption to turnover ratio from year to year. This method ensures that we even out any changes in conditions such as increases or decreases in production activity.

We also use relative, indexed figures to calculate the financial impact of the resource savings.

In 2004, we would, for example, have incurred an additional expense of DKK 13,090,000 for electricity, if the consumption to turnover ratio had remained the same as in 1999.

In order to be able to assess the overall financial gains from environmental activities, it would be necessary to also look at the amount of investments and other costs relating to each individual activity. It is not possible to gather such data at the present moment.

Figure 17

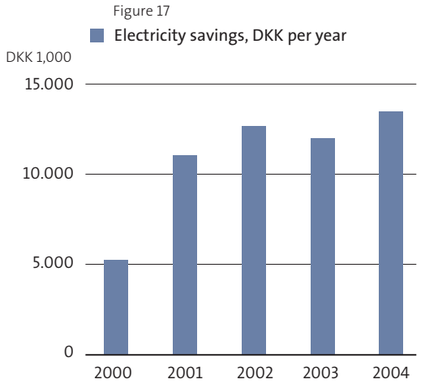


Figure 18

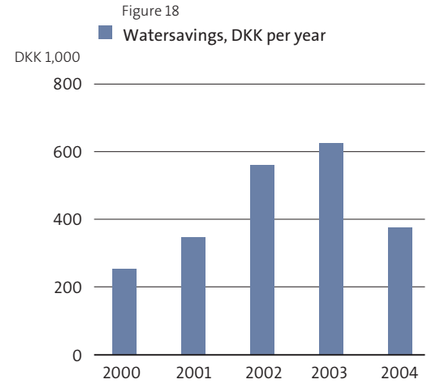
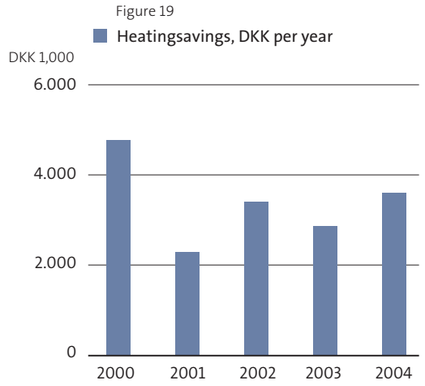


Figure 19



Savings in electricity, water and heating have been indexed in the 1999 consumption.

Data matrix

	Year	Denmark	United Kingdom	France	Taiwan	Germany	China	USA	Hungary	Finland	Total
Electricity consumption, MWh						**Electricity consumption, MWh**					
	2000	79,723	4,243	7,733	2,718	8,829	2,117	7,377	-	-	112,741
	2001	77,165	4,166	6,927	2,566	8,721	2,691	5,289	2,884	1,741	112,150
	2002	76,300	4,112	8,231	2,671	8,688	2,630	4,749	4,667	1,881	113,930
	2003	80,242	4,339	8,732	2,886	8,857	3,154	5,090	6,341	1,795	121,437
	2004	86,841	4,437	8,749	3,370	8,871	3,552	5,016	7,671	2,391	130,898
Water consumption, m³						**Water consumption, m³**					
	2000	127,509	7,863	8,813	14,780	10,893	38,228	46,494	-	-	254,580
	2001	118,213	10,624	8,156	20,040	10,103	53,247	45,860	7,067	2,510	275,820
	2002	116,241	11,414	7,675	17,422	10,638	55,693	41,698	10,270	2,457	273,508
	2003	119,722	15,678	7,990	19,384	10,939	57,255	40,226	11,846	3,084	286,124
	2004	138,753	13,166	7,529	20,382	11,260	68,775	44,810	15,148	4,359	324,182
Heating consumption, MWh						**Heating consumption, MWh**					
	2000	35,639	3,414	2,646	605	7,277	1,495	644	-	-	51,720
	2001	43,113	3,454	2,975	490	8,569	1,981	765	2,873	1,097	65,317
	2002	42,099	2,536	3,060	509	8,083	1,990	740	4,257	959	64,233
	2003	46,572	2,513	3,786	530	9,150	2,064	646	5,622	730	71,612
	2004	46,947	2,645	3,864	538	8,912	2,239	702	5,936	1,298	73,081
Chemical waste, tons						**Chemical waste, tons**					
	2000	399	343	969	123	162	70	33	-	-	2,099
	2001	469	349	1,030	69	184	83	29	51	25	2,290
	2002	460	217	970	83	231	66	28	114	42	2,212
	2003	600	274	803	151	268	79	29	104	42	2,350
	2004	668	335	131	169	274	109	44	127	39	1,897
Other waste, tons						**Other waste, tons**					
	2000	-	-	-	-	-	-	-	-	-	-
	2001	-	-	-	-	-	-	-	-	-	-
	2002	7,823	644	454	326	1,482	388	918	368	108	12,511
	2003	8,158	645	670	548	1,384	415	776	658	112	13,367
	2004	9,019	769	685	580	1,317	300	988	1,012	160	14,830
No. of "red" chemicals						**No. of "red" chemicals**					
	2000	-	-	-	-	-	-	-	-	-	-
	2001	-	-	-	-	-	-	-	-	-	-
	2002	-	-	-	-	-	-	-	-	-	-
	2003	58	0	0	2	8	2	20	0	9	99
	2004	47	1	0	2	3	2	20	0	7	82
Suggestions for environmental improvements, (accumulated)	2000	1,723	8	107	217	-	126	195	-	-	2,376
	2001	2,606	33	354	269	98	188	323	-	-	3,871
	2002	4,040	39	513	333	395	409	655	-	14	6,398
	2003	6,031	54	625	537	725	608	1,168	-	28	9,776
	2004	9,081	79	750	1,102	1,050	1,249	1,695	2	36	15,044
Accident frequency, working hour	2000	34.45	19.69	13.94	25.80	**Accident frequency, accidents per 1 million working hours** 27.91	9.19	36.80	-	-	30.25
	2001	28.06	4.14	9.19	28.45	20.92	11.91	21.90	16.99	222.27	25.57
	2002	21.72	32.86	17.32	9.29	24.36	6.65	25.15	7.27	28.86	20.14
	2003	18.23	22.95	16.69	12.30	12.62	7.38	10.35	34.16	93.00	19.49
	2004	18.22	22.98	3.32	9.94	19.88	9.66	6.12	24.44	68.43	17.94
Accident-related absence working hours hours per 1,000	2000	2.63	1.01	4.50	0.23	**Accident-related absence hours per 1,000 working hours** 3.69	0.45	6.91	-	-	2.84
	2001	2.72	0.39	4.80	0.30	3.63	1.20	2.23	0.51	3.93	2.56
	2002	2.00	7.89	5.60	0.13	2.43	0.37	1.72	0.45	2.97	2.26
	2003	2.30	2.39	3.84	0.10	1.13	1.09	3.23	2.98	7.59	2.31
	2004	1.61	5.05	1.18	0.06	1.40	0.20	1.10	3.46	3.80	1.80

About the report

In the Grundfos Group, the potential impact on the environment and the working environment is bigger in the production companies than in the sales and service companies. Consequently, we have so far concentrated on recording environmental activities in the production companies.

The Grundfos Group environmental report covers the nine production companies that carry the Grundfos name. The production companies are independent legal entities that do not have a sales function.

In order to present a balanced picture of the company, we have, however, found it necessary to use Group data and data collected from our sales companies, and Group functions such as Human Resources, Shipping, Business Development Centre and Planning and Control i.e. we have expanded the scope of the report. This is particularly true regarding data included in the sections Customers and Society.

Production companies that do not carry the Grundfos name are not described. For the present, they operate as independent companies within the Group and are therefore not covered by the management systems and recording requirements as the companies with the Grundfos name. In the past financial year, these companies represented 13.3% of the total Group turnover.

The report deals with products, global and work environmental issues and to some extent with financial issues. The activities and results described in the Group environmental report relate to the 2004 financial year.

Data on the environment and working environment has been collected and processed by the Central Environment Department at Grundfos. Data on the environment and working environment used in the environmental report is collected annually from the production companies according to a fixed reporting procedure and in a standardised format. In the production companies, the key data is collected in accordance with procedures laid down in the environmental management systems. The development of this data is monitored on an ongoing basis. A Group standard was defined for data collection and processing. This standard defines the content of the data and the procedures for quality control of data.

Data and data collection systems form part of the ongoing internal environmental audits and are also included in the tests of the environmental management systems carried out by the external certification bodies.

The efforts to improve the production environment are governed by the environmental management system of the individual production companies.

Although Grundfos goes to great lengths to ensure that the data in this Group Environmental Report is as complete and accurate as possible, certain data may be subject to uncertainty.

Additional information

Glossary

Business Excellence model: A management and assessment model developed by EFQM – European Foundation for Quality Management.
EMAS: Eco Management and Audit Scheme. European directive for environmental management.
ISO 14001: International standard for environmental management.
OHSAS 18001: Standard for occupational health and safety management.
Environmental audit: Spot checks to see if the environmental management system complies with the requirements of ISO 14001, OHSAS 18001 as well as with own requirements.

Calculations of indexes

Indexed key figures on the environment have been used in several places in this report. Indexed figures are used in order to compare figures for different years despite changes in production activity. Most objectives are therefore defined on the basis of indexed key figures.

The exact figures used for the production activity vary from one production company to the other. Some use the number of working hours spent, some turnover, and some entirely different indicators of the production activity. The turnover of production companies that carry the Grundfos name is used to define the overall Group objectives.
Example
If the electricity consumption in 2004 was 100 million kWh and the turnover DKK 2 billion, whereas the electricity consumption in 2000 was 95 million kWh and the turnover DKK 1.8 billion the index for year 2004 compared with 2000 would be: (100/2)/(95/1,8)*100 = 94,7. i.e. a saving of 5.3% from 2000 to 2004.

CHANGE COMPARED WITH GROUP ANNUAL REPORT 2004

The Environmental objectives have been adjusted since the preparation of the financial annual report 2004, which explains the difference in the aims of some of the parameters.

ABOUT THE REPORT

Statement from Deloitte

To the Executive Board of Grundfos

As agreed with Management of Grundfos we have reviewed the Group Environmental Report 2004. The purpose of our engagement was to assess whether the data in the Report at Group level and for the production sites in Denmark and Hungary are in accordance with the stated reporting practice, are documented and whether data pertain to the company's business activities in the period.

The Report is the responsibility of Company's Management. Our responsibility is to express a conclusion on the indicators mentioned above based on our review.

Procedures performed

We performed the engagement in accordance with assurance standard ISEA 3000 with the objective of obtaining a limited level of assurance about the data mentioned above.

We have assessed the reporting practices applied and analysed to corresponding information in the Grundfos Group's audited Annual Report 2004. Our review was limited to conducting interviews with management and employee as well as analysing consistency between data, and to testing samples of information to supporting evidence. Therefore, a limited level of assurance is less than would be the case had an auditlevel engagement been performed.

Conclusion

In conclusion, nothing has come to our attention that causes us not to believe that the data in the Report at Group level and for the production sites in Denmark and Hungary were collected, measured and presented in accordance with stated reporting practices, and that the data are documented and consistent with business activities for 2004.

Aarhus, November 23 2005

DELOITTE
Statsautoriseret Revisionsaktieselskab

H.P. Møller Christiansen
State-Authorised Public Accountant (Denmark)

Preben J. Sørensen
State Authorised Public Accountant (Denmark)

AUDITOR'S REPORT

Grundfos in brief

Water provides life to people, animals and plants, and is a necessity in order for industry to produce. Water is very useful when heating and cooling buildings, and is also used to drain off waste products. Anywhere, where water is a coveted resource or needs to be drained away, Grundfos plays a central role.

Our range of efficient and reliable pump solutions is continuously being expanded. Extensive know-how and intensive research and product development allow us to develop new, trend-setting products which meet ever-increasing requirements made by customers and society at large for improved energy efficiency and a reduced impact on the environment.

In addition to pumps and pump systems, Grundfos develops, manufactures and sells energy-efficient electromotors and sophisticated electronics. Once the electronics are built into the pumps they become "intelligent", i.e. capable of assessing the current need for water and adapt their performance accordingly – all of which results in a significant reduction in energy consumption.

At all stages of production, quality needs to be controlled effectively as we have a high degree of our own production. Also, production control ensures a high productivity while at the same time enabling us to take both the external environment and the working environment into consideration.

With their knowledge and commitment, the employees are the most important resource in the Grundfos Group. Therefore, the Group aims to offer the employees further training and to create an inspiring environment that promotes the development of new products with an increased utility value and high quality for the customers.

In a world characterised by frequent changes in the global economy, the Group's global nature is our customer's guarantee for continuous and easy access to pumps, spare parts and service. Therefore, the Grundfos Group constantly expands its network of sales and service companies in Europe, America, the Middle East, Australia and Asia. High reliability of supply and the possibility of adapting the pump solutions to local requirements are ensured through decentralised production.

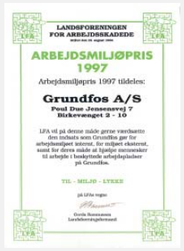
As a globally responsible company, Grundfos strongly emphasises the importance of being in harmony with the environment. All over the world, we are striving to create and strengthen lasting ties with employees and partners as well as the communities in which we operate.

The Grundfos Group is owned by the Poul Due Jensen Foundation, whose primary purpose is to expand and develop the Group. Reinvestment of own funds ensures that the Grundfos Group remains an independent company.

For further information about Grundfos, please visit our website at: http://www.grundfos.com.

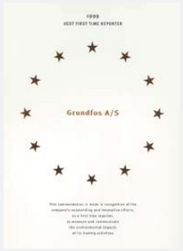
GRUNDFOS IN BRIEF

Diplomas



Working Environment Award, National Association

Environmental Award for Green Products, Society of Danish



Best First Time Reporter

EU Environmental Award for Green Products, Society of Danish, Denmark

1999 Green Accounts Award, Børsen, Denmark

United States Environmental Protection Agency

Award for Best Non-Financial Report, Børsen, Denmark

The Social Index 2001, Secretariat for the Social Index

Diploma for Best Environmental Reporting 2002, Børsen, Denmark

EU Environmental Award, Association of Danish Engineers

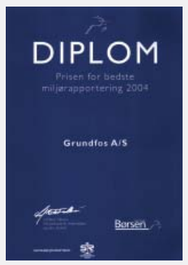
Industriens Uddannelsespris 2000 (The Industry's Edu-

EU Environmental Award, Association of Danish Engineers

Good Practice Commendation "Dangerous substances – handle with care", European Agency for Safety and Health at Work

The European Quality Award Operational Unit

The Social Index 2004, Secretariat for the Social Index



Award for Best Environmental Reporting 2004

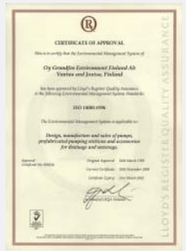
Certificates

ISO 14001, United Kingdom

ISO 14001, France

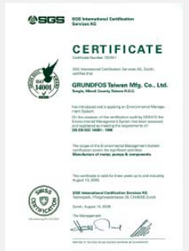
ISO 14001, Denmark

ISO 14001, USA



ISO 14001, Finland

ISO 14001, China



ISO 14001, Taiwan

ISO 14001, Germany

OHSAS 18001, Taiwan

OHSAS 18001, Denmark

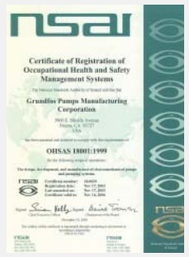
OHSAS 18001, France

Executive Order 923, Denmark

EMAS, Denmark

EMAS, United Kingdom

EMAS, France



OHAS 18001, USA (Fresno)

EMAS, Germany

OHAS 18001, USA (Allentown)

BE › THINK › INNOVATE ›

Being responsible is our foundation
Thinking ahead makes it possible
Innovation is the essence

The Grundfos Group

Northern Europe
Tel.: +44 15 2585 0000

Germany
Tel.: +49 211 92969-0

Eastern Europe
Tel.: +43 6246 883-0

Southern Europe
Tel.: +39 0295 8381 12

North America
Tel.: +1 913 227 3400

South America
Tel.: +55 11 4393 5533

Asia and
the Pacific Rim
Tel.: +65 6865 1222

Australia
and New Zealand
Tel.: +61 8 8461 4611

Japan
Tel.: +81 53 428 4760

Headquarters
DK-8850 Bjerringbro
Denmark

Tel.: +45 87 50 14 00
E-mail:
info@grundfos.com

CVR no. 83 64 88 13

Further information:
www.grundfos.com

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