Group Environmental Report 2002

BE › THINK › INNOVATE ›

GRUNDFOS

The Group President has the floor

Sustainability is one of Grundfos' basic values, and a value that is reflected in the way we choose to do business. We will continue to act in accordance with our values while simultaneously running a profitable and viable company.

Life-cycle considerations play a key role in our environmental improvement work. As a result, environmental conditions are taken into account in all phases of the production – from development and purchasing of raw materials to production, distribution, use and disposal.

We achieved many good results in production in 2002 - as an example, the accident frequency was reduced by 21% and the number of chemicals by 7%.

After working hard for many years to reduce the electricity and water consumption, we now see signs of stagnation, and special attention will therefore be given to these areas in new projects.

The energy consumption during production accounts for most of the environmental impact of the pumps. Although the energy consumption of the Grundfos pumps has already been considerably reduced during recent years, we still try hard to minimise it further. All this year's new products are characterised by lower energy consumption and/or lower material consumption.

The number of environmental improvement suggestions received from staff has increased steadily over the last few years. This is a very satisfactory trend as there was a risk that the commitment would gradually lessen once the "easy" solutions had been implemented.

In 2002, as a result of our efforts, Grundfos was granted the European Commission's Danish environmental improvement award in the "Good Environmental Management" category for "the extensive and thoroughly prepared implementation of life-cycle based environmental management within the Grundfos Group, as well as for the company's systematic environmental considerations in product development".

The way in which the Grundfos Group describes its environmental work was also rewarded in 2002, when the Danish Institute of State Authorised Public Accountants and the newspaper Dagbladet Børsen, awarded Grundfos the diploma for best environmental report. The report was commended for the plain and simple manner in which it described environmental results achieved within the company through environmental initiatives involving customers and employees, as well as for social and financial results.

Such recognitions, together with the results achieved during the year in our environment work, are a great encouragement to continue our efforts to contribute to a sustainable development.

This year, we have again endeavoured to produce a report that in plain language describes the many environmental initiatives and results of 2002.

Niels Due Jensen
Group President

Summary

The 2002 Group environmental report is the fourth such report prepared by the Grundfos Group. The report is divided into the chapters Management, Staff, Customers, Society and Finance in accordance with the general principles of the Business Excellence model. The structure also uses examples to describe how Grundfos lives by its slogan: Be responsible–Think ahead–Innovate.

Management

Grundfos' vision clearly reflects the Group's strong, basic values about responsibility for human beings and the environment, among other things.

This vision is supported by the environmental policy, which is also the Group's occupational health and safety policy.

Grundfos' environmental policy states that all production companies carrying the Grundfos name must have an environmental management system in place that complies with international standard ISO 14001. The system must be in place no later than three years after acquisition or establishment. In addition, several production companies have chosen to implement a certified occupational health and safety management system according to the OHSAS 18001 standard.

The Group has defined a set of environmental objectives in the areas of electricity consumption, water consumption, chemical waste, the number of chemicals used in the production, accident frequency and accident-related absence. All production companies must define individual objectives in these areas.

Staff

The Staff section of this report describes the initiatives and results that relate to the work environment and staff health and safety.

Grundfos is convinced that a good work environment is a key component of an attractive and responsible workplace. The company's pro-active work to improve work environment and health and safety is therefore an integral part of the environmental management system and of day-to-day life at Grundfos.

At Group level, the number of chemicals used in production, the accident frequency and the accident-related absence has been singled out as the most important aspects of the work environment. The production companies may choose additional target areas of special importance to them.

Customers

Grundfos' products and the way they operate at the customers' premises, are the Group's main contribution to a sustainable development. The ability of the products to procure water from inaccessible places, circulate water in heat and air-conditioning plants, correctly measure doses of chemicals, remove sewage in a responsible manner etc., are

	Management	Staff	Customers	Society	Finance
Be responsible					
Think ahead					
Innovate					

in themselves examples of sustainable solutions. Examples from the real world are used to illustrate the above.

The first example describes a solution where a Grundfos SQFlex pump supplies water to 1,800 inhabitants in the South African village of Abatunga. The SQFlex pump is driven by solar energy, or alternatively by wind energy, if there is no sun. It is also possible to switch to a generator as backup.

In Algeria, Grundfos pumps are part of a flexible, modular seawater desalination plant that converts seawater to drinking water. The pumps are used in an inverted osmosis plant, where the water is desalinated and other impurities removed. The modular construction means that the plant can be adjusted according to needs, which saves energy.

The Arla Group cheese factory in Rødkærsbro uses Grundfos Digital Dosing pumps to add iron chloride in order to precipitate the phosphor content in the factory's wastewater. The very accurate dosing prevents an overuse of chemicals, and after treatment, the wastewater is sufficiently clean to be either reused in the factory or be discharged straight into the Gudenå river.

In St. Petersburg, Grundfos sewage pumps are used in the city's wastewater treatment plant. The Grundfos pumps save energy compared with the pumps previously used and, in addition, require less maintenance.

Society

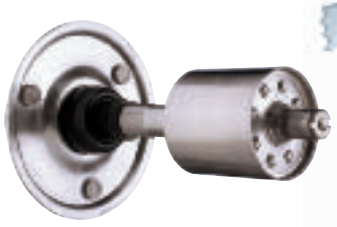
The society at large means the global society and not just the local society in which our production companies operate. Grundfos assesses the environmental impact throughout the life cycle of the products, from raw material extraction and product development to manufacture, transportation, use and disposal.

Grundfos has also defined environmental objectives for the energy consumption during the use phase of the product and for the amount of material used in the products. Other objectives exist for the reduction of electricity and water consumption during production and the amount of chemical waste. Considerable reductions have been achieved in most of the mentioned areas, but there are signs of stagnation in electricity and water consumption - the areas that we have been focusing on for a long time. Grundfos is therefore increasingly focusing on new initiatives in these areas.

Finance

Grundfos would like to be able to illustrate the financial side of sustainability. Primarily because it is always important for a company to be able to evaluate the profitability of its activities, and secondly because it is motivating for the staff to see that the company's efforts to improve the global and work environments are financially viable as well.

Grundfos has made some calculations to show how much higher the company's expenses for electricity, water and heating would have been if the 1997 ratio of consumption to turnover had been maintained. Total costs would have been DKK 22 million higher in 2002.




Grundfos in brief

An annual production of approximately 10 million pump units makes Grundfos one of the world's leading pump manufacturers. The pumps are manufactured by Group production companies in Denmark, Germany, France, Hungary, United Kingdom, Finland, the United States, China and Taiwan.

Grundfos' products are primarily sold through Grundfos' own national companies. Grundfos is represented by sales companies in all parts of the world, and in addition, local distributors in a number of countries also sell Grundfos pumps.

The Grundfos Group is a private company owned by the Poul Due Jensen Foundation.

The foundation's main objective is to expand and develop the Group, primarily by reinvesting own, realised funds, and to make sure the Grundfos Group remains an independent company in accordance with the founder's wish.

The daily task of the Grundfos pumps is to provide water in an effective and reliable manner, whether water for human consumption, for irrigation of fields and watering of animals, for industrial processes, heating and cooling of buildings or wastewater discharge.

In addition to pumps and pump systems, Grundfos develops, produces and sells electric motors and high-technology electronic equipment to make the pumps "intelligent', increase their capacity and minimise their power consumption.

The Group is dedicated to continued research in new materials and processes in order to be able to introduce new, groundbreaking pumps and pump systems that satisfy market requirements to efficient, reliable and energy-saving plants.

Quality is key in all Grundfos products. This implies a focus on construction, design and choice of materials and production processes. A high degree of own production ensures high productivity, a healthy work environment and consideration for the external environment.

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

Key figures, amounts in million DKK	1998	1999	2000	2001	2002
Net turnover	7,520	8,145	9,522	10,214	10,703
Profit before Tax	495	476	739	618	726
Capital investments	524	655	725	870	798
R&D costs	324	336	380	458	454
Equity capital	2,732	3,033	3,573	3,935	4,205
Minority interests	463	509	597	597	612
Number of employees	9,305	9,591	10,773	10,985	11,383

Certain figures in the Group Environmental Report of 2001 have been amended with retroactive effect in accordance with the Danish Company Accounts Act.

The flags indicate production companies with the Grundfos name that have been certified according to the international ISO 14001 environmental standard. One exception is the Hungarian company that is expected to become certified in 2003 or at the beginning of 2004.

Management

The Grundfos Group has strong basic values that characterise the daily activities at all levels of the organisation. In its shortest form, Grundfos expresses these values as "Be–Think–Innovate" or Be responsible, Think ahead and Innovate. Be responsible – or responsibility – is about our responsibility for our staff as well as for the society at large. The concept is therefore akin to the fundamental principles about striving for sustainability and credibility that Grundfos has followed for many years.

The values are also expressed in Grundfos' vision - the vision of the future that the company is trying to achieve.

- 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 content among company staff, as the jobs and terms of employment provide opportunities for personal development, and the work environment is characterised by consideration for the individual staff member's aspirations and qualifications.

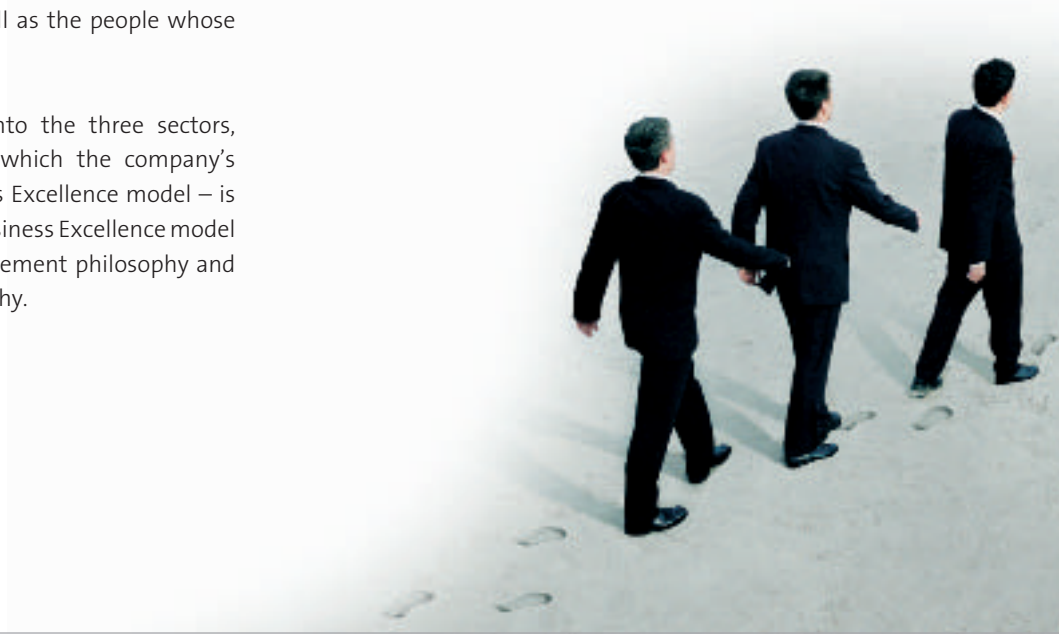
- Society at large holds Grundfos in high esteem and recognises the Group for its strict adherence to legal requirements and its respect for democratic principles, local traditions and environment, as well as the people whose lives and conditions are affected.

The vision reflects the division into the three sectors, customers, staff and society, on which the company's management model – the Business Excellence model – is built. In the Grundfos Group, the Business Excellence model comprises the Total Quality Management philosophy and The Learning Organisation philosophy.

- *At Grundfos, the responsible approach to environmental issues is reflected in a desire to be a sustainable company. The company's environmental policy is an expression of this desire for sustainability, which is put into practice via environmental certification of all production companies carrying the Grundfos name.*

- *Grundfos sets ambitious objectives for all production and production-related issues that have an impact on the environment. Clear goals make it easier to hit the mark.*

- *Grundfos has always been a market leader in pump technology. Innovation is a result of pushing borders and looking for new opportunities. This innovative approach has resulted eg. in more "intelligent" pumps that continuously adjust their capacity to current needs – thereby saving energy and caring for the environment.*



On the one hand, the Business Excellence model describes what Grundfos does - ie how Group implements its various tools, resources and processes. On the other hand, the model describes what Grundfos achieves - ie the results of the various initiatives for staff, customers and society. Learning and innovation are achieved through ongoing assessments that also form the basis of prioritisation and adjustment of future projects.

In day-to-day life, Grundfos' values translate into the efforts made by management and staff in the group to achieve the desired results.

To achieve good results, all parties must be involved in these efforts and dedicate themselves to adhering to these values. In order to promote this corporate culture, management delegates responsibility and authority to the individual employee and the various teams of which the employees are part - within their own functions and across the organisation.

The environment is everybody's responsibility

As is the case with other Grundfos activities, the company also involves staff in the environmental work as much as possible. The responsibility for the environment is therefore widespread and anchored throughout the organisation - from top management to the individual employee.

Group environmental policy

Grundfos wishes to be perceived as a clean company where sustainability and credibility are decisive parameters for the way the company is operated.

Grundfos wishes to contribute openly and actively to improvements of both the internal and the external environment, and to work pro-actively towards a safe and healthy work environment.

The Group wishes to live up to national and international environmental standards, as a minimum. The measures should mainly be preventive. The tool is certified environmental management in all production companies.

The environmental impact and the use of resources should be minimised in the entire Group through the development of new products and processes within a financially sound framework.

The environmental impact of the product throughout its life should be evaluated and described. If possible, products should be designed with reuse and recycling in mind, and product as well as packaging should be disposed of in a responsible manner.

Grundfos service departments should be able to receive, repair and recommend channels for the disposal of worn-out products.

Grundfos should aim at applying the most rational production method with due consideration for the environment and use clean technology where financially and technically feasible.

Group purchases should be based on partnerships where ethics and maximum consideration for the environment are decisive factors.

Buildings, installations and technical equipment should be maintained in safe working order using environmentally friendly materials. Contractors working on Group projects are subject to the same requirements to the work environment as Group employees.

When assets are sold, Grundfos will ensure that they are handed over in an environmentally sound condition.

The Group will motivate staff, customers, suppliers and other interest groups to practise environmental awareness through training and information.

From the very beginning, management decided to use staff suggestions as the basis for ongoing improvements. The Group therefore makes a consistent effort to motivate staff to make suggestions - eg through courses that focus on the influence of the individual on the environment in day-to-day life. As a result, the number of suggestions for improvement increased again in 2002.

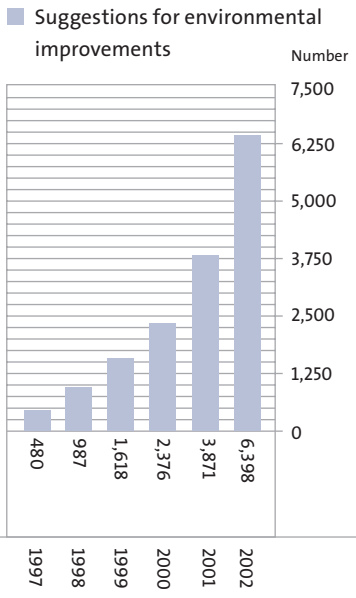
It proves that environmental control at Grundfos is more than just an administrative system understood and applied by a small number of individuals. Together, the many small improvements create big results, and it is therefore important that all employees are involved and contribute actively.

Group management defines Grundfos' environmental policy and overall objectives. All production companies pursue the common goals via individually defined objectives and parameters. Every year, each production company reviews its environmental objectives to make sure they are adjusted to current conditions and requirements.

The environmental objectives of the Group were one of the items on the agenda, when the environmental managers of the production companies gathered for a 2-day seminar. Another item on the agenda was the exchange of experience regarding occupational health and safety with a focus on the number of work accidents. In order to optimise the prevention of accidents, a working group was established with the task of devising a system for uniform classification of the causes of work accidents in the entire Group. Other working groups were given the task of establishing general guidelines for the classification of chemicals and chemical waste.

Environmental learning across the organisation is also promoted through the cross-sectional audit team that has been established. Auditors can contribute new ideas to the company they are auditing – and can get ideas for use in their own company.

The introduction of certified health and safety management, according to the OHSAS 18001 standard, is a good example of how learning is spread across the Group. OHSAS 18001 was implemented in the Danish company in the year 2000, and the French and Taiwanese companies have since become certified. Many of the other companies also plan certification, as can be seen from the table that also shows other certifications.



	ISO 14001	EMAS	OHSAS 18001
Denmark	x	x	x
Germany	x	x	2005
United Kingdom	x	x	2003
France	x	x	x
The United States	x		2003
Taiwan	x		x
China	x		2003
Finland	x		
Hungary	2004		

EMAS registration is only possible in Europe

Grundfos creates sustainable solutions

Care for the environment characterises the way in which Grundfos does business at all levels and is an integral part of company solutions. Grundfos wishes to make a difference by contributing to a sustainable development - eg by developing pumps with decreasing energy consumption. Approximately 20% of the world's total electricity consumption can be ascribed to the operation of pumps, so this is obviously an area that has a major impact on the environment.

A conventional pump always operates at full revolutions - when the need decreases, the flow of water is reduced by means of a valve. This corresponds to a driver reducing speed by applying the brakes while still stepping on the gas.

Today, many Grundfos pumps are equipped with built-in electronic control systems that make them "intelligent". This ensures that the output always matches the exact need for the pumping task at hand. It equals the mentioned driver letting go of the gas pedal – which considerably reduces the energy consumption.

These pumps therefore make a huge difference – both in terms of the end user's costs and the global environment. In this context, it is worth remembering that approximately 1.5% of the world's total electricity consumption is used to operate Grundfos pumps.

Grundfos' strong commitment to environmentally friendly technologies is also reflected in the solar powered pump systems developed for dry and barren areas. These pumps provide valuable water without straining the environment and are therefore a good example of the close link between responsibility and sustainability.

To Grundfos, sustainability is not just a question of the environment – the Group also aims at running a company that is both financially and socially sustainable. This report mainly deals with the environmental aspects, but the financial consequences of the company's environmental initiatives will also be discussed.

Subject	Environmental objectives	Term
Electricity	Reduction of indexed electricity consumption by 20% compared with 2000	31-12-2005
Water	Reduction of indexed water consumption by 10% compared with 2000	31-12-2005
Chemical waste	Reduction of indexed chemical waste by 20% compared with 2000	31-12-2005
Number of chemicals	Reduction of number of chemicals to 1200	31-12-2004
Work accidents	Accident frequency: 18 accidents per 1 million working hours Accident-related absence: 2 accidents per 1 million working hours	31-12-2005
Electricity consumption of products	At least 80% of new products developed between now and 2006 must have an electricity consumption that is 5% less than the previous model, as a minimum. If the previous model is less than 5 years old, the objective is a 2% reduction.	31-12-2005
Material consumption of products	All new products developed between now and 2006 must consume fewer resources than the previous model.	31-12-2005

Staff

Grundfos is convinced that a good work environment is a key component of an attractive and responsible workplace. The company's pro-active work to improve the work environment and health and safety is therefore an integral part of the environmental management system and of day-to-day life at Grundfos.

Group Management has decided which work environment issues are covered by the Group's environmental objectives. The conclusion is that the number of different chemicals used in the production, the accident frequency and the accident-related absence are the three issues that all production companies must measure and for which objectives should be defined. In addition, the companies may choose to measure other environmental aspects of special importance to them such as monotonous, repetitive work, the psychological work environment, the use of chemicals, noise, etc.

Work environment, health and safety

Production chemicals

For many years, Grundfos has measured and controlled the number of chemicals used in production. This work has produced other advantages besides achieving the desired result of reducing the number of chemicals used.

- Fewer chemicals lead to a better understanding of the risk involved in handling the individual chemicals.

- It becomes easier to identify and substitute the chemicals that represent the greatest risk to global and work environments.

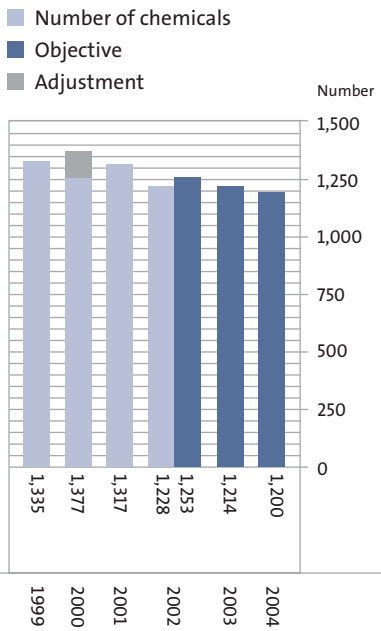
- Finally, it is an advantage to use as few chemicals as possible, as it makes it easier to reduce the chemical consumption measured in kg and to optimise wastewater treatment.

At Group level, the objective is to reduce the number of chemicals to 1,200 before the end of year 2005. The original objective to reduce the number of chemicals by 9% before the end of 2002, as compared with year 2000, has been met, as shown in the graph.

It becomes difficult to compare historical data when a new production company becomes part of the Group and part of the data set. The Hungarian and Finnish production companies became part of the Group in 2000, and the data regarding the number of chemicals used have only been available since 2001. In order to evaluate the objective, the figure for 2000 has been increased by 10%, which equals the two companies' combined share of the total number of chemicals in 2001.

The chemicals used are eg paint, epoxy, acids/bases, soaps, oil and grease. The figure includes chemicals that are not subject to labelling requirements.

The chemicals that are subject to labelling requirements are the most harmful in terms of work environment and should therefore be phased out first. Grundfos has therefore decided to divide the chemicals into different groups: a red, a yellow and a green group, where the worst chemicals in terms of global and work environment will be classified as red, and the mildest chemicals that are not subject to labelling requirements will be classified as green. The purpose of this classification is to make the progress of phasing out the red chemicals more measurable and visible. The project has the added benefit of increasing the knowledge of chemicals in the production companies.



- *Correct labelling and storage of chemicals contributes to responsible handling. The availability of protection and up-to-date safety data sheets in the production is an important part of the work to ensure chemical safety at Grundfos.*

- *As a result of a new initiative, the chemicals will be divided into a red, a yellow and a green group. The aim is to reduce the use of chemicals subject to labelling requirements.*

- *Grundfos uses the latest technology to continuously look for new solutions for using the mildest possible chemicals in the smallest possible amounts.*

Work accidents

In 2001, the reduction of the number of work accidents was defined as the foremost target area for the entire Group. The decision was made when Grundfos admitted at the end of year 2000 that the number of work accidents was unacceptably high for a company with the objective of being an attractive and responsible workplace.

In 2001, the Group therefore left no stone unturned in its efforts to reduce the number of work accidents. The efforts have been continued in 2002, as indicated by the results in this section.

The first step was the introduction of general guidelines for the recording of accidents in all production companies.

The use of the same general guidelines makes it possible to compare figures from the different production companies, which in turn permits an exchange of knowledge across the Group.

A considerable effort has also been made to register near-accidents and accidents that do not result in absence from work. Near-accidents are incidents where a marginal difference prevents the incidence from becoming an actual accident. By recording these incidents and in particular by following up on the causes, the company has taken an important step towards preventing work accidents.

In order to draw attention to the accidents throughout the Group, "pump men" were placed at the main entrance to the factories in the Danish production company. The "pump men" display the number of days since the last work accident, explain how the accident occurred and what has been done to prevent it from reoccurring.

The American production company introduced the concept "behavioral based safety". A number of employees have been trained as so-called observers.

The observers were appointed to observe, in a positive and objective manner, how other employees perform normal everyday tasks. The observers were trained to spot situations that might develop into accidents or work-related injuries. When such a situation is spotted, the next task consists in changing work procedures and habits in order to avoid the inappropriate work positions.

All these initiatives, and more, have combined to produce an impressive result as regards the reduction of the accident frequency as well as the work-related absence.

The accident frequency has been reduced by 33% on a Group level from a frequency of 30.25 accidents per 1 million working hours in year 2000 to a frequency of 20.14 in year 2002.

Work-related absence has been reduced by 20% from 2.84 hours of absence per 1000 working hours in year 2000 to 2.26 hours in year 2002. A reduction in work-related absence also has an impact on the bottom line. The reduction in the Danish production company alone corresponds to approximately three full-time employees.

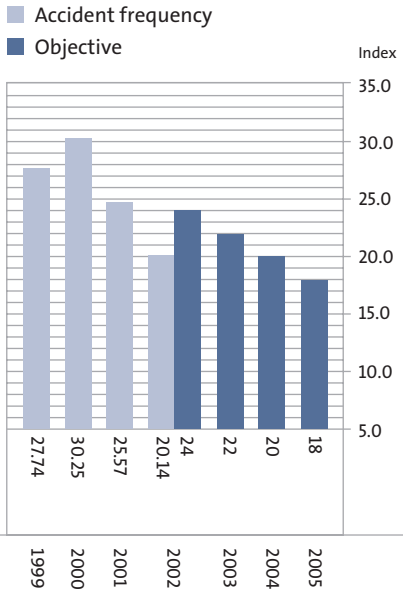
The new, revised objective for accident frequency is to reduce the number to 18 accidents per 1 million working hours before the end of 2005, and the objective for accident-related absence is a reduction to 2.0 hours before the end of 2005.

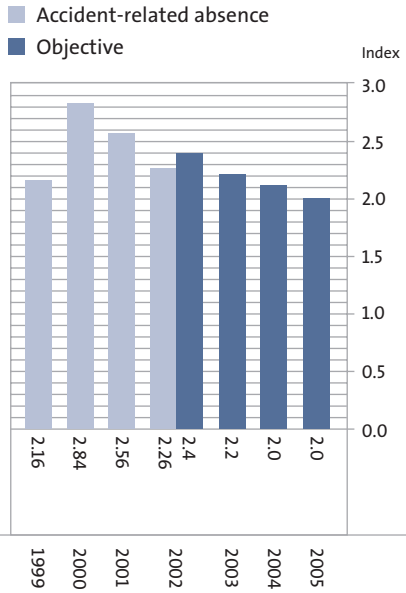
A further reduction of the number of work accidents requires a continued improvement of preventive work. Group management has therefore decided to prepare a set of general guidelines for classification of the causes of accidents and near-accidents. A classification of the causes will make it easier to focus the preventive work on the areas that need it most, and, once again, the purpose is also to spread knowledge across the Group.

Other targeted areas

Many other initiatives than the ones described are being taken within work environment and health and safety in the production companies. Exactly what area is being targeted depends on local legislation and customs in the individual countries and what the management of the company decides. The following example describes an initiative in the Danish production company in the area of monotonous, repetitive work.

All workplaces are registered in a database. The workplaces are classified as red, yellow or green, with green as the best classification. Grundfos managed to considerably reduce monotonous, repetitive work last year by implementing better rotation between workstations in the production groups and increased automation and by introducing robots.





Example of an EGA task:
The work carried out at some lathes involves the processing of metal pipes and bars of varying thickness. Previously, the lathes were equipped with storage facilities for 3-metre long bars. The bars have a diameter of between 8 and 50 mm, and 3-metre long bars are therefore both heavy and difficult to handle. Most lathes are now equipped with short bar loaders for metal bars with a length of approximately 1.2 metres. The work has therefore been made easier for the employees, who no longer have to lift heavy loads.

Additional benefits are:

- Less noise. The noise level has been reduced from approximately 80 dB to the current approximately 74 dB.

- Oil spills have been eliminated, as the short bar loaders push the bars further by means of air pressure instead of hydraulics.

- With the short bar loaders, the lathes work a lot faster than before. As a result of the improved efficiency, the repayment time for the short bar loaders is less than one year.

- The layout of the workplaces has been improved, and there is more space in the departments.

- *Grundfos' sense of responsibility towards the individual employee is reflected in the focus on avoiding work accidents throughout the Group.*

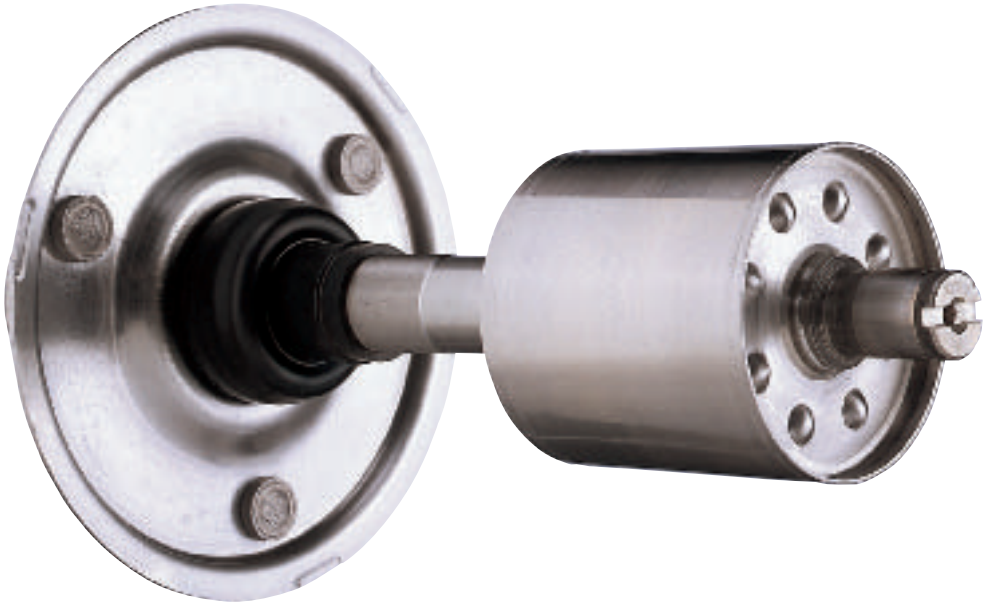
- *The registration of near-accidents and risk evaluations of processes and equipment are examples of initiatives that were introduced in order to increase the focus on prevention rather than cure.*

- *An increasing number of robots in the production helps reduce the impact on employees as a result of monotonous, repetitive work.*

Customers

Grundfos' products and the way they operate at the customers' premises are the Group's main contribution to a sustainable development. The low energy consumption that characterises Grundfos pumps contributes to reducing the release of greenhouse gasses at a global level. The actual jobs performed by the pumps, such as providing water from inaccessible places, dosing chemicals in the correct quantities and disposing of wastewater in a responsible manner are in themselves part of the concept of sustainability.

Examples from the real world can be used to illustrate how Grundfos pumps perform tasks for our customers for the benefit of people and the environment. The following four examples describe situations where Grundfos pumps are part of systems that provide, treat, use or dispose of water.



Now there is water – all the time

In the village of Abatunga near the city of Durban in South Africa, life for the approximately 1,800 inhabitants was turned topsy-turvy a few years ago. A Grundfos SQFlex pump was installed in their well, and from that day onwards, the water supply has been reliable. The women in the village can collect fresh water from a central water tap, whenever they need it.

The tap was already there, but the installation was driven by power from the local power station, and was unreliable. The inhabitants could never be sure whether the pump functioned or not, but that problem is now a thing of the past.

The SQFlex installation consists of a solar-powered submersible pump that pumps clear ground water from a well to two 4000-litre containers placed 500 metres from the tap. Now there is always sufficient water for the inhabitants of the village. It is true that there are no taps in the houses, so the women still have to walk some distance to get water, but at least now they know they are not going in vain, as there is always water in the tap.

One of the water tanks is placed near the local school that has approximately 300 pupils. Toilets and washbasins have now been installed at the school. Previously, there was neither running water nor toilets, and the school still has no electricity.

The SQFlex installation in Abatunga is run by solar energy, as sunshine is plentiful. If the sun should fail to shine, it is easy to switch to the backup generator. Finally, the SQFlex can also run on wind energy, if the wind is stronger than the sun.

Apart from the brief periods where the generator has to be used, the water supply in this small society has no impact at all on the environment. Therefore, in addition to getting a good and reliable water supply, the inhabitants of Abatunga have also given the environment a helping hand.

- *With solar power as energy source, the inhabitants in a South African village have been given a good and reliable water supply that has no impact on the environment.*
- *The school children in the small South African village of Abatunga now have toilets and washbasins at their school. This provides them with an important foundation for improved health while growing up.*
- *The Grundfos SQFlex pump can be driven by solar energy, wind energy or a generator. The pump can therefore be adapted to use the best possible energy source available on site.*

Seawater becomes drinking water in Algeria

There is an enormous need for water in a big city. In countries like Algeria, where huge areas are covered by desert, it is not always easy to get access to underground water resources or natural springs. On the other hand, the country has the Mediterranean as its nearest neighbour. The Mediterranean has copious amounts of water, but the water is so salty it is undrinkable.

By using reverse osmosis, it is possible to desalinate the water and remove all forms of impurities, leaving fresh, clean, drinkable water. In the suburbs of the capital of Algeria, approximately 150,000 inhabitants are supplied with water in this way. Grundfos pumps built into compact, modular water treatment plants help produce 12,500 cubic metres of desalinated water per day for the supply of drinking water to the suburbs.

Each of the water treatment plants contains four Grundfos BMET booster modules for seawater. The BMET module, which Grundfos developed especially for reverse osmosis plants, is equipped with an energy-recovering turbine that results in considerable electricity savings.

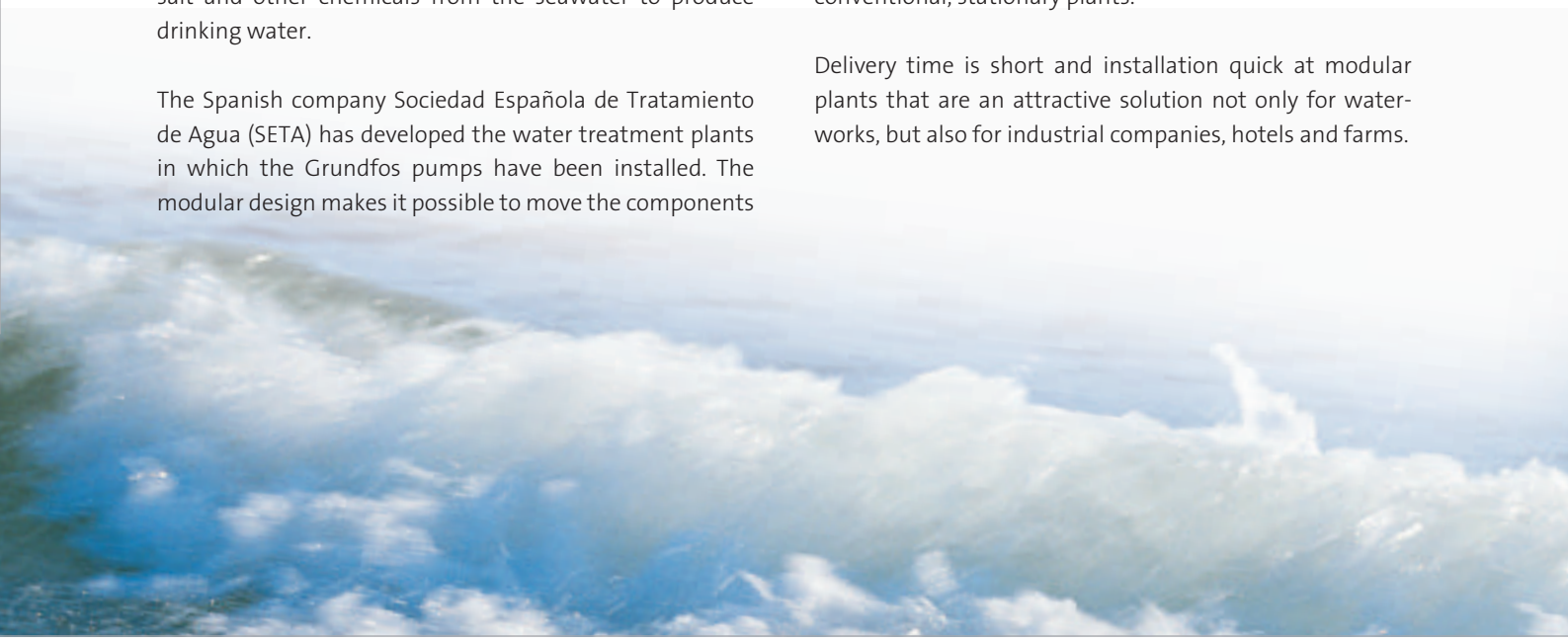
In addition to the booster modules, the plants also comprise submersible pumps for water supply and industrial pumps for filter and diaphragm purification. The pumps remove salt and other chemicals from the seawater to produce drinking water.

The Spanish company Sociedad Española de Tratamiento de Agua (SETA) has developed the water treatment plants in which the Grundfos pumps have been installed. The modular design makes it possible to move the components around and change the set-up thus making the plants far more flexible than a conventional large plant with only one or two large pumps.

During periods when the customer only needs part of the capacity, some of the pumps in the modular plants may be shut down to save energy and keep the costs per cubic metre water at the same low level as water produced in conventional, stationary plants.

Delivery time is short and installation quick at modular plants that are an attractive solution not only for waterworks, but also for industrial companies, hotels and farms.

- *The Grundfos BMET booster module, which was designed specifically for reverse osmosis, is equipped with an energy-recovering turbine.*
- *In future, clean drinking water will be a scarce commodity. Desalination of seawater is one solution to this problem.*
- *Grundfos pumps form part of modular plants that are far more flexible than a conventional large plant with only one or two large pumps.*



Dosing pumps protect the environment

Arla Foods, one of Europe's largest dairy groups, has built an ultramodern wastewater treatment plant at the group's cheese factory in Rødkærsbro in Central Jutland. The factory produces 30,000 tons of mozzarella cheese a year. Waste water from the cheese production treated in the new plant becomes so clean that it can be discharged straight into the Gudenå river without any problems.

In order to operate, the plant needs constant and reliable information from the control panel, as a single error in the treatment process would result in extensive and costly production breakdowns in less than 24 hours.

The wastewater treatment plant is monitored by a fieldbus network that is connected to Grundfos Digital Dosing pumps and controls the entire plant. The plant has six dosing pumps. Four of the pumps dose iron chloride for the precipitation of any phosphor content in the water.

- *At Arla's cheese factory in Central Jutland, which produces 30,000 tons of mozzarella cheese a year, the wastewater is cleaned to the extent that it can be discharged straight into the Gudenå river without any problems.*
- *Grundfos Digital Dosing pumps are built according to a simple design and are very easy to adjust. They dose liquids very accurately and thereby prevent unnecessary waste of the liquid in question.*
- *Grundfos Digital Dosing pumps can be connected to a fieldbus network capable of configuring all the pumps connected to the network. As a result, the pumps can be remotely monitored and controlled.*

The pumps are controlled by phosphor sensors that send information about the phosphor content in the water to a controlling PC. If the phosphor content rises above a certain limit, the dosing pumps start pumping iron chloride into the water, and the dosing is likewise reduced the minute the phosphor content decreases.

The remaining two dosage pumps are used to stabilise the pH level of the wastewater. The pumps add acid and lye respectively to the water to ensure that the pH value of the water remains between 6.5 and 8.5. The pumps are controlled by a pH sensor that is also connected to the PC.

After this treatment, the water is conducted through aeration tanks and subsequently through sand filters, where the phosphor content is again measured and iron chloride added, as required. As a result of this treatment, the water is consistently clean and free of phosphor when discharged into the Gudenå river.

The ability to perform extremely accurate dosing makes the Grundfos Digital Dosing pumps unique. The risk of chemical spills is thereby removed, which has been a strain on the environment in the past and has caused companies to incur unnecessarily high costs. In addition, the fieldbus system gives an early warning signal long before the phosphor content becomes too high, and the system therefore automatically prevents errors from occurring.

The design of the Grundfos Digital Dosing pumps is extremely simple contrary to the dosing pumps previously available. Earlier pumps were much more difficult to adjust and there-fore inaccurate. The Digital Dosing pump can accurately dose quantities from 0.002 litres per hour to 48 litres per hour.

St. Petersburg looks after the Gulf of Finland

St. Petersburg, with 5 million inhabitants, is the second largest city in Russia and beautifully situated at the bottom of the Gulf of Finland. This beautiful location has its downsides, however, as the Gulf of Finland is part of the narrow Baltic Sea area that is extremely vulnerable due to its very delicate environmental balance.

It is therefore extremely important for St. Petersburg city to have an effective wastewater treatment system in order to ensure that wastewater from the many inhabitants and industries in the city does not pollute the gulf.

In the 1970s, the city built an artificial island opposite the harbourfront to remedy this problem. A large, central plant was installed on the island to treat the wastewater from the approximately 2 million inhabitants of the city.

In 1998, the plant's pump station for the return of sludge was renovated because it no longer met current requirements for environmental protection. Today, the pump station has 8 Grundfos Environment pump units in operation. The new pumps have given the plant some major advan-

- *The location of St. Petersburg with its millions of inhabitants at the bottom of the Gulf of Finland creates a huge responsibility for the water environment in the gulf. Grundfos' sewage pumps are part of a plant that helps the city protect the water environment by cleaning the city's waste water.*

- *Grundfos considers environmental protection to be one of the greatest challenges of the future. As a logical consequence of this attitude, Grundfos decided some years ago to add sewage pumps to the Group's original product range.*

- *Grundfos has developed and patented a new SmartTrim system that facilitates the maintenance of sewage pumps. The system permits the adjustment of the clearance of the pump impeller without dismantling of the pump. The impeller clearance affects the pump's ability to pump wastewater.*

tages. The reduced energy consumption alone is a spectacular environmental improvement.

The low maintenance costs were another pleasant surprise for the management of the plant. The reliability and sustainability of the new pumps are several times higher than those of the pumps previously used in the plant.

Since the installation of the first Grundfos pumps, the pumps have only been stopped twice in connection with normal oil checks. Apart from that, they have run continuously.

The maintenance of the pumps is also extremely simple. A SmartTrim system, which is an external system used to adjust the impeller clearance, allows the operator to adjust the clearance without disconnecting the pump from the pipe system, as would be necessary for pumps of a conventional design. The clearance can be checked from the outside and, if necessary, be adjusted to its original position using the SmartTrim system that was developed and patented by Grundfos. The impeller clearance is checked once a year in connection with normal service.

Society

As a responsible company, Grundfos is concerned about the impact the company has on society at large – especially in an environmental context. The society at large means the global society and not just the local society, in which the Group's manufacturing companies operate. In other words, Grundfos has a holistic approach to the company's environmental impact on society at large.

A holistic approach is also the key word when Grundfos evaluates the environmental impact throughout the products' entire life-cycle. In the life-cycle perspective, the environmental impacts of the products from raw material extraction and product development, to production, transportation, use and disposal are taken into consideration.

This chapter describes the environmental impact on society at large during the entire life-cycle of the products.

Environmental impact on society

Based on life-cycle considerations, the environmental impact of the products on society at large, can be divided into the following phases:

- Product development
- Purchasing/raw materials
- Production
- Transportation
- Use
- Disposal

The section begins with an introductory description of life-cycle analysis, followed by a step-by-step discussion of the life-cycle of the products. The phases: product development, use and disposal have been combined under the heading "Product-related environmental factors".

Life-cycle analysis

Grundfos uses the UMIP tool (Development of Environmentally Friendly Industrial Products) to undertake life-cycle analyses on own products. Grundfos participated in the development of the UMIP method.

By performing a life-cycle analysis, it is possible to compare the different kinds of impact a product has on the environment during its life-cycle and thereby evaluate which ones are the most important. For Grundfos products in general, it has turned out to be the energy consumption during the use phase of the products that has the biggest impact on the environment in a global perspective.

Product-related environmental factors

Energy consumption during the use phase

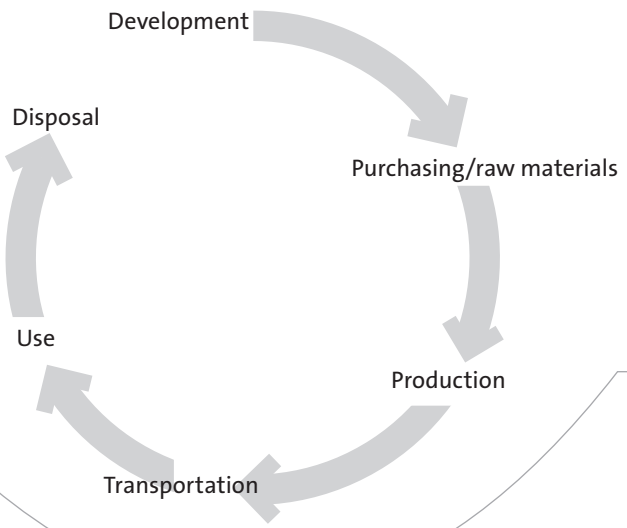
Based on statistics about energy consumption, it is estimated that approximately 1.5% of the world's total electricity consumption is used to operate Grundfos pumps. By focusing on making pumps that consume less energy, Grundfos has the potential to make a huge difference to the environment.

Until the end of 2002, Grundfos had the following objective for improvement of new pumps in terms of the energy consumption in the use phase:

- At least 80% of new products developed up until 2003 must have an electricity consumption that is 5% less than the previous model, as a minimum.

Since the objective was defined in 1997, the products shown in the table on page 30 have been released for sale. The table shows the percentage reduction that has been achieved in the new pumps compared with previous models of the same pump type. The two last-mentioned pumps were released for sale in 2002.

The objective has been met as 93% of the products that can be compared with a previous model, consume at least 5% less energy than the corresponding previous model. In fact, an average reduction of 22% has been achieved on the new products compared with the previous models.



According to the new objective, at least 80% of new products developed up until 2006 must consume 5% less electricity than the previous model, as a minimum. If the previous model is less than 5 years old, the objective is a 2% reduction of the energy consumption.

Actual sales figures have been used to make an estimate of the total annual energy saving achieved by replacing previous Grundfos pump models by new energy-saving models. The estimate is based on Grundfos' experience with the customers' use of the pumps, among other factors. The result, expressed as the annual energy consumption of an equivalent number of households, is shown in the graph. In year 2002 alone, energy savings achieved by introducing new, energy-saving Grundfos pumps equalled the annual electricity consumption of 114,799 households.

Other product-related environmental factors

Other factors with an impact on the environment such as choice of material and amount of material used are also important environmental factors in Grundfos products seen in a life-cycle perspective.

Grundfos has also defined company objectives in terms of amount of material used:

- All new products developed between now and 2003 must consume 3% less material than the previous model, as a minimum.

As regards the products released for sale in year 2002, the objective was met for the TP pump but not for the SQFlex. In cases where a reduced material consumption would have a negative impact on the possibilities of achieving high energy efficiency, the latter will be given top priority.

The new objective in this area is that new products developed between now and 2006 must, as a starting point, use fewer resources than the previous model. The new objective is less ambitious than the previous one on account of the higher prioritisation of high energy efficiency mentioned above.

- *By replacing old Grundfos pumps with new energy-saving Grundfos pumps, the release of greenhouse gases is reduced. The energy savings achieved in year 2000 by replacing existing Grundfos pumps with the new Magna pump, are estimated to correspond to the annual energy consumption of 10,468 households.*

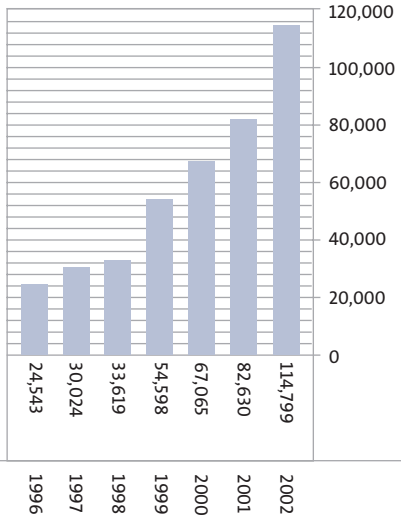
- *Objectives have been defined for the reduction of energy and material consumption in all new Grundfos products that can be compared with a previous model.*

- *The energy savings in the new products are achieved through the use of modern technology. Examples of technology that makes Grundfos pumps more energy sufficient are permanent magnet technology and electronic control of the pumps to ensure they only work as and when required.*

This Group environmental report does not show energy savings as accumulated figures for several years, as opposed to previous reports.

Energy savings on products

Expressed as the annual energy consumption of an equivalent number of households



Product	Energy consumption		Material consumption		Instructions for disposal
	Objective, %	Achieved, %	Objective, %	Achieved, %	
UPE	-	40	-	0	OK
Large SP	5	8	3	3	OK
SQ	5	33	3	34	OK
Large CR	5	11	3	36	OK
AP Basic	5	30	3	26	OK
CS50	5	38	3	0	OK
MTA*1	-	-	-	-	OK
Dosering*1	-	-	-	-	OK
WPU	5	15	3	10	OK
AP-controller*2	-	-	3	0	OK
CHV	5	0	3	+13	OK
Small-CR	5	15	3	+13	OK
HM2000	5	7	3	+1	OK
Magna*3	25	28	15	16	OK
Magna*4	40	57	15	17	OK
MQ*1	-	-	-	-	OK
SQFlex	5	25	3	+46	OK
TP	5	5	3	14	OK

**1: No comparable previous products*
**2: Comparison of energy consumption not possible*
**3: Compared with UPE*
**4: Compared with UPS*
A + in front of the figure for material consumption indicates an increase compared with the previous model.

93% of the products that can be compared with a previous model consume at least 5% less energy than the corresponding previous model.

The SQFlex pump is not directly comparable with the previous model, as the two pumps use different principles. In addition, the SQFlex pump is primarily operated by means of solar or wind energy.

In addition to the objective relating to the use of material, the company had another objective relating to the preparation of instructions for disposal of all types of Grundfos products before 2003. This objective has not been renewed, as the preparation of instructions for disposal is now standard procedure for all new products.

Purchasing

Environmental management is an integral part of daily work in the Group's purchasing departments, where staff are responsible for ensuring that the suppliers comply with Grundfos' environmental requirements. Extensive questionnaires are used when negotiating framework agreements with suppliers in order to assess their environmental management systems. The questionnaire can be seen on the Grundfos Web site. The degree of compliance is determined by visits to the suppliers.

Production-related environmental factors

There is no doubt that the electricity consumption of the products during the use phase is the most important environmental factor from a global point of view. In the countries where Grundfos has production companies, the local production-related environmental factors are nevertheless also very important.

The environmental managers from the production companies have together pinpointed the most important production-related environmental factors that are common to all parts of the Group. The environmental factors in question are: electricity consumption, water consumption and chemical waste. In addition, the number of different chemicals used in the production and the number of accidents as well as accident-related absence were highlighted as important factors for the work environment, as described in the section on pages 12-17.

On the basis of the above, Group management has determined the overall environmental objectives for the Group. The following is a brief description of the reason why precisely these environmental factors were highlighted as important.

The electricity consumption is important because of the CO_2 emissions produced. However, the reduction of the electricity consumed during production is also important from a financial point of view.

The use of water for production processes means that an equal amount of wastewater or, in some cases, chemical waste has to be disposed of at the end of the process. For that reason alone, it is important to reduce the water consumption, however, once again, it is also important to save water from a financial point of view.

In many cases, chemical waste is classified as dangerous waste according to applicable law, which in itself indicates how important it is to the environment. Chemical waste, however, also represents a wasted resource, ie chemicals that have been turned into waste. There are again valid financial arguments for reducing the amount of chemical waste.

Electricity consumption

Considerable savings in electricity consumption in pro-duction have been achieved since the certification process in the entire Grundfos Group began. Since 1997, the indexed consumption has been reduced by 26%. Like the other environmental objectives, the objective for indexed electricity consumption has been adjusted in connection with management's annual evaluation of the environmental management system. The adjusted objective is to further reduce the indexed electricity consumption by 20% before the end of year 2005, as compared with year 2000.

Although the Group has worked on reducing the electricity consumption for many years, many production companies still come up with good examples of successful electricity savings. The American company has established a group called "Reduce the juice", with the task of reducing the electricity consumption. In the matter of one year, the indexed electricity consumption was reduced by 10%, which should be seen in the light of the fact that the indexed electricity consumption had already been reduced during previous years. In addition to the savings in electricity consumption, savings have also been achieved by changing working hours to reduce consumption during peak daytime hours, and these efforts have had considerable impact on the bottom line.

In 2002, the Chinese production company expanded, and the production area has almost doubled in size compared with 2001. Despite the expansion, the indexed electricity consumption was reduced by 29%. Additional electricity meters were installed in order to facilitate the monitoring of the electricity consumption and thereby make it possible to target problem areas.

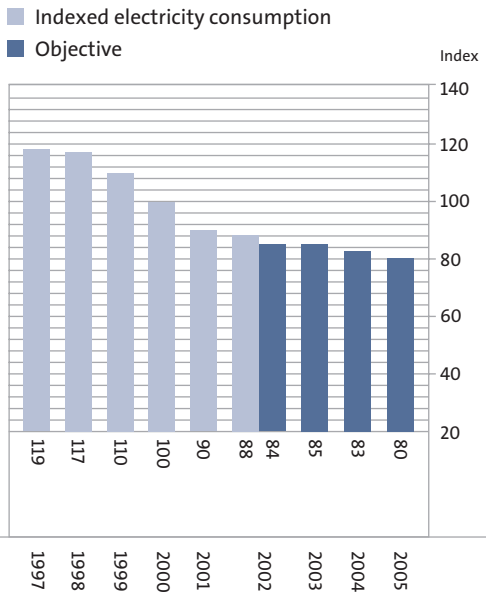
If the development of indexed electricity consumption is showing signs of stagnation despite these success stories, it is mainly a result of a corresponding stagnation in the Danish production company. The Danish production company accounts for approximately 67% of the Group's entire electricity consumption. The Danish production company has been focusing on a reduction of electricity consumption since certification in 1996, and a reduction of 26% has been achieved – or an amount that equals the annual electricity consumption of approximately 6000 households. As time goes by, it becomes increasingly difficult to find new ways of saving electricity – the obvious solutions having already been implemented. To this should be added the fact that increased legal requirements to ventilation have resulted in more frequent air renewal in many parts of the production, and the two factors combined have led to the stagnation.

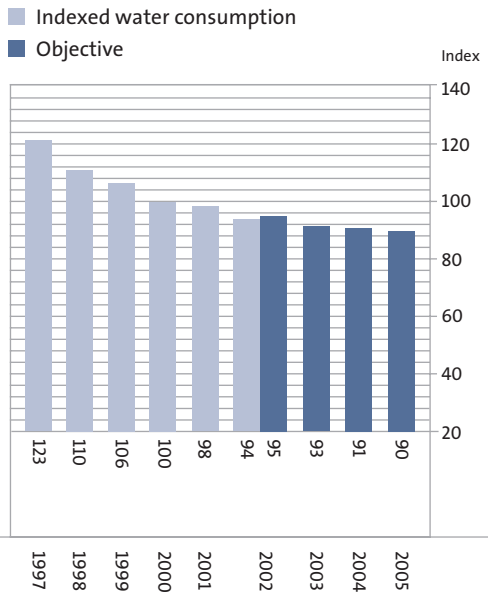
Water consumption

In the production, water is used for washing of components, for rinsing and dilution in surface treatment processes, in test stations for finished pumps and in cooling towers. Water consumption is another area where considerable savings have been achieved since the certification process began in earnest in the Grundfos Group. By the end of year 2002, the indexed water consumption had been reduced by 24% compared with 1997. The partial objective for 2002 has been achieved, as the objective was index 95, and the actual index achieved was 94.

The objective for water has been adjusted, and the new objective is to achieve a further 10% reduction of the indexed water consumption by the end of 2005, as compared with the year 2000.

As with the other environmental factors, the savings on water consumption have been achieved thanks to many suggestions for both small and large improvements from staff at all levels of the organisation. The reductions have been achieved by implementing proposals for anything





from water-saving measures on toilets and taps to large recycling initiatives on water-consuming processes in the production.

The Taiwanese production company reduced their indexed water consumption by 24% between 2001 and 2002 alone. A detailed diagram of water consumption created a better understanding of the water-consuming processes. A leakage was detected and stopped.

The Chinese company also increased their focus on water consumption in 2002, and one of the new measures was the daily monitoring of consumption. By changing the rinsing process in the cataphoresis plant - a plant for surface treatment of pumps - the water consumption was reduced. In total, the company's indexed water consumption was reduced by 25% between 2001 and 2002.

Chemical waste

Examples of chemical waste are paint waste, waste oil, used absorption materials for the absorption of waste oil, sludge from wastewater treatment plants, used batteries and much more. The waste stems from many different production processes, and the quantities vary greatly from one production company to another.

There are many reasons for these differences. One reason is that the companies differ in size and that not all production companies use the same processes. Another reason is the fact that waste classifications differ from country to country, and as a result the bases of calculation of waste figures are not entirely identical. Finally, the different production companies have reached different stages of the process of reducing the quantities of chemical waste.

On the basis of the experience from the Danish as well as other production companies, the potential for improvements in the area of chemical waste is considered to be considerable. Management has therefore decided to make an additional effort to further map the chemical waste. A working group has been set up to specify three groups of chemical waste: a red, a yellow and a green group. The chemical waste that has the greatest impact on the environment is classified as red, and the waste with the

- *The production-related environmental factors are important in a local perspective – to the local communities in which the production companies operate. That is why some of Grundfos' objectives involve the reduction of electricity consumption, water consumption and chemical waste from the production.*
- *Efforts are being made to create uniform reporting standards for quantities and indexes from the different production companies. This will allow a comparison to be made between the companies and create a basis for sharing of knowledge and experience.*
- *The Danish production company monitors and controls ventilation, cooling and room heating via a central computer.The same computer stores key data regarding the consumption of electricity, water, heating and compressed air.*

least impact is classified as green. The working group has been given the task of preparing a list that indicates to which group each type of waste belongs. It is expected that the new classification will permit the individual production companies to get a better idea of what type of chemical waste they produce, but the main objective is to give the production companies an opportunity to learn from each other, so that good initiatives may be spread throughout the Group.

Already during the past year, steps were taken to standardise reporting from the production companies with regard to the quantities of chemical waste. Different types of chemical waste not previously reported were included in this year's figures by the German and the American production companies in particular, and as a result, the figures are clearly different from the figures of previous years. Both companies have adjusted their data with retroactive effect.

In the British production company, the indexed amount of chemical waste was reduced by 39% in just one year. This excellent result was achieved by optimising the use of coolants and lubricants.

The French production company accounts for a relatively large share of the Group's total amount of chemical waste. One of the main reasons for this is the fact that the waste water from a specific production process is being disposed of as chemical waste in accordance with local government requirements. The company has carried out some tests with evaporation and recycling of the wastewater, and the test results were promising. The solution is expected to be fully implemented in 2003.

In the Danish production company, tests and implementation of a new type of wastewater treatment, in which wastewater from the production undergoes a chemical treatment, took place in 2002. The solution was implemented as a result of increased government requirements that have now been met. The disadvantage of the solution in question is that it results in a relatively large amount of sludge, which has caused the indexed amount of chemical waste for 2002 to rise. The company is planning to trial biological treatment of the wastewater in 2003.

The planned initiatives in the Danish and French production companies, which together account for approximately 64% of the total amount of chemical waste, are the main

reason for the ambitious, revised objective at Group level. The objective is to reduce the indexed amount of chemical waste by 20% before the end of 2005, as compared with 2000.

Other production-related environmental factors in addition to electricity, water and chemical waste, heating consumption and other waste, other than chemical waste, are also measured. No objectives have been defined for these environmental factors, but the development is being monitored.

Transportation

The next phase in the life-cycle of the products is the transport from Grundfos to end user. As mentioned earlier, the transportation only accounts for a small part of the environmental impact of the products in a life-cycle context. Grundfos has, nevertheless, decided to further map the environmental impact that results from the transportation phase.

Together with the Group's carrier, Schenker, Grundfos records the emissions produced during transportation between the Group's distribution centres: Denmark <-> Germany, Denmark <-> France and Denmark <-> Hungary. The total amount of emission of carbon dioxide, nitric oxide, sulphur dioxide and particles from all three routes is calculated on an annual basis.

The main parameters that Grundfos and Schenker can use to affect the impact on the environment of this transport are:

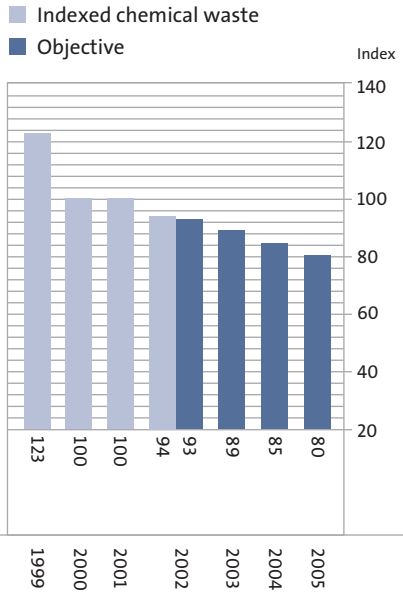
- The load ratio, ie how well the space in the trucks is utilised.

- The EURO norm for the truck. The EURO norms are an environmental classification scheme for trucks according to which a high EURO norm implies less environmental impact from emissions to the surroundings.

The load ratios as well as the average EURO norm for the trucks were mapped in 2002 for the above-mentioned routes. As far as the routes Denmark <-> Germany and Denmark <-> Hungary are concerned, 82% of the transportation took place by EURO 2 trucks and the remainder by EURO 3 trucks. On the Denmark <-> France route, 77% was transported in EURO 2 trucks and the remainder in EURO 3. The load ratios for 2002 are shown below.

Denmark <-> Germany: 72%
Germany <-> Denmark: 30%
Denmark <-> Hungary: 85%
Hungary <-> Denmark: 88%
Denmark <-> France: 74%
France <-> Denmark: 81%

The figures are particularly interesting when looked at as a trend - ie when comparing figures from several years. Such a comparison will be made in next year's Group environmental report.



Finance

An activity's ability to produce value can, and should, be measured and evaluated according to a variety of criteria. Not all results can be measured in monetary terms and instead have to be evaluated as qualitative results, something which is hard to measure. As an example, it can be difficult to estimate the financial advantages of an improved psychological work environment or the improved layout of a workstation, even though an indirect saving in the form of a reduction of sick days or fewer accidents in the workplace can be expected.

Despite these difficulties, Grundfos would like to express the results in the work environment and health and safety areas in key financial figures, primarily because it is always important for a company to be able to evaluate the profitability of its activities, but also because it is motivating for staff to see that the efforts to improve the global and work environments are financially viable as well.

Value calculation

In the previous sections, the initiatives and results in the areas of global and work environment have been described for each of the following groups: staff, customers and society. This section primarily focuses on environmental factors that affect the production phase of our products – and where the effects therefore remain within the company's four walls.

The financial results shown should be regarded as rough calculations. The calculations are in no way based on a detailed mapping of environmental costs.

Financial results related to resource savings

Decrease in the use of resources in the form of electricity, water and heating are some of the environmental factors that Grundfos has targeted for the longest period of time. When resource consumption is measured and compared over a number of years, it is often difficult to find a good basis for the comparison, as conditions change over the years. As an example, the production activity may have increased or decreased, preventing a direct comparison of the absolute figures relating to consumption. Grundfos has therefore chosen to use relative, indexed figures, and thus uses consumption in relation to turnover in production companies carrying the Grundfos name as a basis for the year-to-year comparison.

The same problem arises when calculating the savings achieved on resource consumption in monetary terms. It is not sufficient to simply compare the invoice amounts for the different years and then use the difference as an expression of the amount saved – or the additional cost incurred. The method Grundfos has chosen is to calculate how much higher the costs of electricity, water and heating would have been, if the consumption to turnover ratio had been the same as in 1997, the first year for which comparable data are available.

The results are shown in the graphs on page 39. In 2002, for example, the additional cost of electricity would have been DKK 18.5 million if the consumption to turnover ratio had been the same as in 1997. 2002 prices were used in the calculation of the figures for all years.

In order to evaluate if the environmental initiatives have been financially sustainable, it is necessary to take the costs and investments into account that were expended in order to achieve the results. However, this is very difficult for a number of reasons. One reason is that most investments are made for many different reasons, of which the environment is only one. The question is then how much of the investment should be allocated as a cost of improving the environment. Grundfos has therefore refrained from making any attempt to determine the total amount invested in initiatives to improve the environment. Instead, the investments are evaluated one by one, and costs or savings in the environmental area form part of the normal calculations of repayment times.

Visibility of environmental costs

If environmental costs are to be included in the investment calculations, environ-mentally related unit costs must be made visible, so they can be used by the staff making the investments. Examples of unit costs are: the costs of using 1 m^3 water, 1 kg of a specific type of chemical or eg 1 m^3 compressed air. Grundfos is in the process of calculating such unit costs and making them visible in a way that makes them easy to understand and work with.

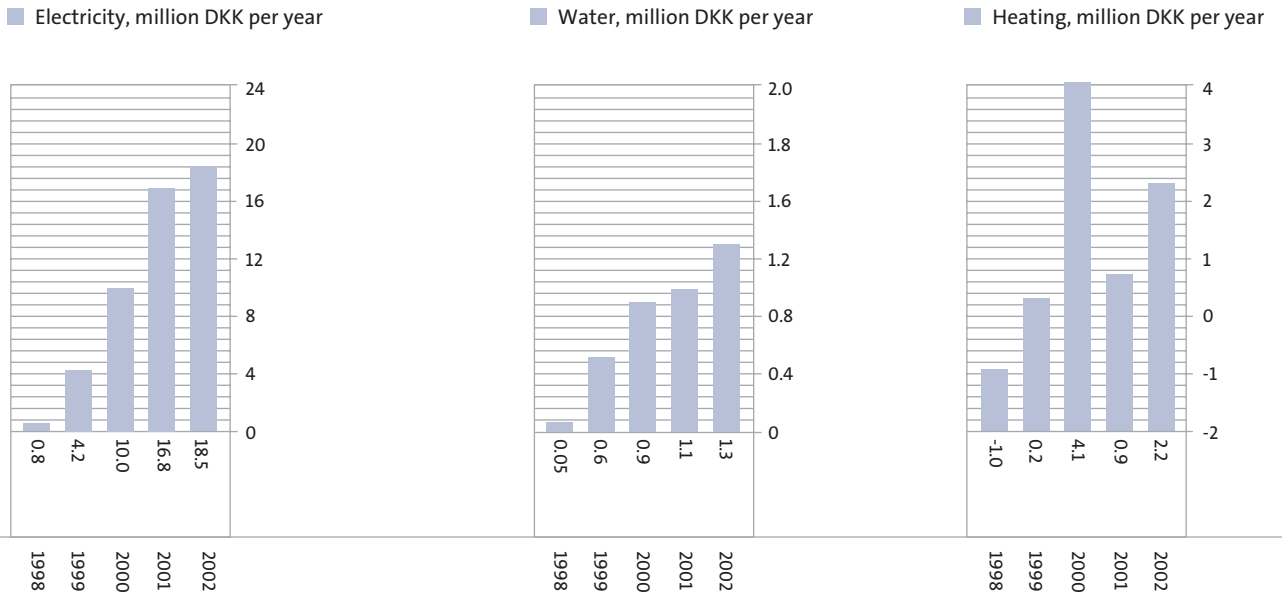
As an example, the unit cost of 1 m^3 water used as processing water has been calculated at DKK 120 per m^3 in the Danish production company. The unit cost includes:

- Purchase of water
- Drainage charges
- Costs for chemical treatment of wastewater
- Special fee for heavy metals in wastewater
- Disposal of wastewater sludge
- Costs for transportation of wastewater
- Dredge pump costs

The cost therefore includes purchase costs as well as costs of disposal of the water. Instead of the fixed DKK 120 per m^3, it would be more accurate to calculate a cost that varies according to how dirty the wastewater is. In this case, Group has decided to use an average estimated cost instead of a more accurate figure that would be more difficult to apply.

The unit costs as key financial figures for environmental costs can be used for other purposes than investment calculations. They are also useful to highlight the financial benefits of environmental improvements in general. The key financial figures are used to motivate staff to make more suggestions for environmental improvements, because it is more satisfying to make suggestions when it is clear how much impact it has on the results.

The graphs show how much higher the Group's costs for electricity, water and heating would have been, if the consumption to turnover ratio had been the same as in 1997.



Datamatrix

		Denmark	United Kingdom	France	Taiwan
Electricity consumption, MWh	1997	78,216	4,626	6,432	2,095
	1998	78,218	4,138	6,676	1,942
	1999	75,137	4,073	7,223	2,224
	2000	79,723	4,243	7,733	2,718
	2001	77,165	4,166	6,927	2,566
	2002	76,300	4,112	8,231	2,671
Water consumption, m^3	1997	128,163	6,678	8,043	15,594
	1998	109,705	9,266	7,968	16,865
	1999	111,523	8,553	8,978	16,720
	2000	127,509	7,863	8,813	14,780
	2001	118,213	10,624	8,156	20,040
	2002	116,241	11,414	7,675	17,422
Heating consumption, MWh	1997	43,596	-	2,814	264
	1998	42,155	2,871	4,128	231
	1999	37,655	3,361	4,095	412
	2000	35,639	3,414	2,646	605
	2001	43,113	3,454	2,975	490
	2002	42,099	2,536	3,060	509
Chemical waste, tons	1997	668	584	-	91
	1998	543	504	-	92
	1999	416	410	1,009	186
	2000	399	343	969	123
	2001	469	349	1,030	69
	2002	460	217	970	83
Other waste, tons	1997	-	-	-	-
	1998	-	-	-	-
	1999	-	-	-	-
	2000	-	-	-	-
	2001	-	-	-	-
	2002	7,823	644	454	326
Number of chemicals	1997	725	-	117	68
	1998	682	-	115	60
	1999	597	91	104	55
	2000	560	102	111	50
	2001	526	103	102	53
	2002	485	104	96	68
Suggestions for environmental improvements (accumulated)	1997	425	-	34	21
	1998	833	-	78	76
	1999	1,321	1	105	132
	2000	1,723	8	107	217
	2001	2,606	33	354	269
	2002	4040	39	513	333
Number of accidents, accidents per 1 million working hours	1997	37.57	-	8.44	-
	1998	38.30	31.22	6.55	52.34
	1999	32.49	16.79	10.15	8.42
	2000	34.45	19.69	13.94	25.80
	2001	28.06	4.14	9.19	28.45
	2002	21.72	32.86	17.32	9.29
Accident-related absence, number of hours per 1000 working hours	1997	2.60	0.59	2.13	-
	1998	3.60	3.05	3.52	1.10
	1999	2.40	1.27	1.66	0.23
	2000	2.63	1.01	4.50	0.23
	2001	2.72	0.39	4.80	0.30
	2002	2.00	7.89	5.60	0.13

** The water consumption figures for China for 1998 include a leakage that is not included in the indexed consumption in the graph on page 32.*

Data, Hungary: There was a general increase in figures from 2001 to 2002 as a result of a considerable increase in production.

Germany	China	The United States	Hungary	Finland	Total
7,695	808	7,553	-	-	107,426
7,568	1,073	8,047	-	-	107,664
8,462	1,457	7,536	-	-	106,114
8,829	2,117	7,377	-	-	112,743
8,721	2,691	5,289	2,884	1,741	112,150
8,688	2,630	4,749	4,667	1,881	113,930
40,755	8,302	42,300	-	-	249,835
19,565	*40,485	47,200	-	-	251,054
13,957	22,736	49,376	-	-	231,843
10,893	38,228	46,494	-	-	254,580
10,103	53,247	45,860	7,067	2,510	275,820
10,638	55,693	41,698	10,270	2,457	273,508
9,284	5,567	531	-	-	62,056
8,804	7,389	732	-	-	66,311
8,224	11,406	828	-	-	65,981
7,277	14,919	644	-	-	65,143
8,569	19,768	765	2,873	1,020	83,027
8,083	19,860	740	4,257	959	82,103
-	-	-	-	-	-
-	-	17	-	-	-
104	9	30	-	-	2,164
162	30	33	-	-	2,059
184	59	29	51	25	2,265
231	68	28	114	42	2,213
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
1,482	388	741	368	108	12,333
36	-	-	-	-	-
41	83	-	-	-	-
43	60	385	-	-	1,335
46	75	310	-	-	1,254
47	79	277	34	96	1,317
98	81	208	30	58	1,228
-	-	-	-	-	480
-	-	-	-	-	987
-	40	19	-	-	1,618
-	126	195	-	-	2,376
98	188	323	-	-	3,871
395	409	655	-	14	6,398
16.45	13	67.06	-	-	-
18.30	8.06	54.80	-	-	-
30.51	9.69	32.70	-	-	27.74
27.91	9.19	36.80	-	-	30.25
20.92	11.91	21.90	16.99	222.27	25.57
24.36	6.65	25.15	7.27	28.86	20.14
5.07	4.14	-	-	-	-
3.72	2.58	6.15	-	-	-
2.79	0.23	4.14	-	-	2.16
3.69	0.45	6.91	-	-	2.84
3.63	1.20	2.23	0.51	3.93	2.56
2.43	0.37	1.72	0.45	2.97	2.26

Statement from Deloitte & Touche

To the executive board of Grundfos

We have been engaged by the management of Grundfos to perform certain control procedures related to the company's group environmental report for 2002 (the Report).

Procedures performed

At corporate headquarters and at a sample of sites, we conducted interviews and tested on a sample basis supporting documentation. Our procedures included comparing the data presented in the Report with internal registrations and other supporting documentation supporting the collected data.

· We ascertained whether the data collection procedures, described on page 44, were used at corporate level to collect data from reporting units, and whether the data collected in this way are appropriately reflected in the Report.

· We compared the 2002 data reported from a sample of two production sites, Bjerringbro (Denmark) and Longeville (France), to the source documentation supporting the submitted data.

· We compared the information in the Report to corresponding information in the Grundfos Group's audited Annual Report for 2002.

As the above procedures constitute neither an audit nor a review in accordance with Danish auditing standards, we do not provide any assurance on the correctness of the total Report.

Conclusion

Based upon our work, we find that systematic data collection procedures have been applied for the purpose of collecting 2002 data from the reporting units for inclusion and appropriate reflection in the Report. For the two reporting units identified above, submitted data were consistent with the source documentation presented to us. The information in the Report is further consistent with corresponding information in the Grundfos Group's audited Annual Report for 2002.

Aarhus, 25 April 2003

DELOITTE & TOUCHE
Statsautoriseret Revisionsaktieselskab

H.P. Møller Christiansen,
State Authorised Public Accountant

Preben J. Sørensen,
State Authorised Public Accountant

Changes compared with Group environmental report 2001

Compared with the Group environmental report for 2001, some changes have occurred in the procedure for collecting data from the production companies. Stricter definitions have been introduced for the individual environmental factors in order to obtain comparable data across the Group.

As a result, some of the production companies have changed their practices in order to comply with the new definitions and guidelines. It has also had the effect that some of the data presented in the Group environmental report for 2001 have now been amended.

In addition, some errors were noted during internal data control in the production companies. These errors have been corrected, and this correction has also resulted in some changes in relation to the Group environmental report for 2001. The errors and changes are as follows:

- Electricity consumption: In the Group environmental report 2001, the data was shown in kWh in the data matrix on pages 40-41, whereas the unit by mistake was shown as MWh.

- Water consumption, France, 2001: By mistake, an additional room was not included in the figure for 2001, and the figure has therefore been amended.

- Heating consumption, China: In the past, an incorrect calorific value was used for natural gas. This has been changed with retroactive effect.

- Chemical waste, the United States, Germany and Taiwan: Additional types of chemical waste have been included on account of the new definitions for chemical waste. The figures have been changed with retroactive effect.

- Other waste: This is a new bulk category that replaces the previous solid waste, recyclable waste and scrap metal categories. The category is defined as all waste except chemical waste.

- Number of chemicals, UK, 2001: was erroneously indicated as 102 instead of 103.

- Accident frequency, UK, 1997-2001: The earlier practice was changed on account of the new definition of accident frequency. The figure has been changed with retroactive effect.

- Accident frequency, accident-related absence, heating consumption and chemical waste for Finland and Hungary, 2001: The Finnish and Hungarian production companies reported for the first time in 2001, and the figures for that year were generally subject to some uncertainty.

- Accident-related absence, Taiwan, 2001: The figure had originally been incorrectly calculated but has now been changed from 0.13 to 0.30.

Basis of the report

Grundfos' Group environmental report covers the nine production companies that carry the Grundfos name. Companies that do not carry the Grundfos name at this stage operate as independent companies within the Group and therefore do not yet have to comply with the same basic values and business principles as the companies with the Grundfos name. In the past financial year, these companies represented 12.5% of the total turnover of the Group.

The report deals with global and work environmental issues and to some extent with financial issues. The initiatives and results described in the Group environmental report apply to the 2002 financial year.

The data has been collected and processed by Grundfos' Central Environment Department. Data for 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 are collected in accordance with procedures laid down in the environmental management systems. The development of this data is monitored on an ongoing basis. In connection with the collection of data for this report, an additional effort was made to standardise the data collection process in the form of a guideline with specific definitions of what the data should comprise and procedures for quality control of the 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.

Indexed figures have been used in the report. Please see the "Additional information" section for a more detailed description.

Additional information

Glossary

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.

EPI: Environmental Performance Indicator. Key figures for environmental factors – used in connection with indexed figures.

Environmental audit: Spot checks to see if the environmental management system complies with the requirements of ISO 14001, OHSAS 18001 as well as with internal company requirements.

Business Excellence model: Management model.

Calculation of index and financial key figures

This report uses indexed key figures in many places. Indexed figures are used in order to compare quantities from 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 completely 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 2002 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 million, the index for year 2002 compared with year 2000 would be: (100/2)/(95/1.8)*100 = 94.7,i.e. a saving of 5.3%.

The financial calculations of savings in resource consumption were based on the following consideration: How much more would Grundfos have paid for electricity/water/heating, if the consumption to turnover ratio had been the same in 2002 as in 1997.

Local costs of the different resources were taken into account. The conversion into DKK was based on the exchange rates as at 1 January 2003.

Accident frequency and accident-related absence

The accident frequency is measured as the number of accidents per 1 million working hours. The accident-related absence is measured as the number of hours of absence per 1000 working hours.

The method for calculating working hours in the Danish production company has changed. The change took effect half way through 2002. As a result of the change, the number of course hours is now estimated as a percentage of working hours performed, but the change has little effect on the accident frequency figures.

Printed on environmentally friendly paper.

Certificates

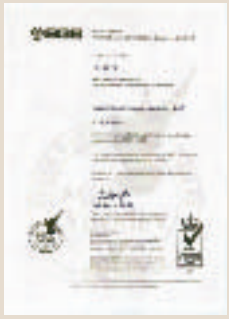
ISO 14001, United Kingdom

ISO 14001, France

ISO 14001, Denmark

ISO 14001, The United States

ISO 14001, Finland



ISO 14001, China

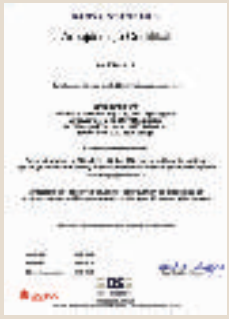
ISO 14001, Taiwan

ISO 14001, Germany

OHSAS 18001, Taiwan

OHSAS 18001, Denmark

OHSAS 18001, France



Bekendtgørelse 923, Denmark

EMAS, Denmark

EMAS, United Kingdom

EMAS, France

Emas, Germany

Diplomas


ARBEJDSMILJØPRIS
1997


MILJØPRIS 1997


DEN GRØNNE
REGNSKABSPRIS
1999


DIPLOM
INDUSTRIENS
UDDANNELSESPRIS
2000

BE > THINK > INNOVATE >

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

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