



Environment and health are closely related

Strategy and Action Plan to protect public health against
environmental factors

ENVIRONMENT AND HEALTH ARE CLOSELY RELATED

Strategy and Action Plan to protect public health against environmental factors

The Danish Government, 2003

Ten-point plan

- 1. Negative impacts from chemicals are to be reduced, and the substitution of hazardous substances by less hazardous ones must be accelerated**
- 2. The incidence of allergy and respiratory disorders is to be reduced**
- 3. Measures directed at endocrine-disrupting substances are to be intensified**
- 4. Noise nuisance is to be reduced**
- 5. The negative impacts on health from air pollution and from the indoor climate are to be reduced**
- 6. Food is to be safe and free from pollution**
- 7. Groundwater and drinking water must be protected**
- 8. Research into the significance of environmental factors on health is to be enhanced**
- 9. Cooperation between the authorities must be strengthened**
- 10. Increased attention must be accorded to environmental factors and health in international cooperation**

Preface

Cleaner environment - healthier Danes

A long, good and healthy life. This is undoubtedly our greatest desire for ourselves, our children, our family, and our friends.

The environment considerably affects our health - both positively and negatively. For example, hazardous chemicals, pathogenic bacteria, and air pollution make us ill and worried. And this detrimentally affects our quality of life.

The government is therefore putting forward its first strategy for environmental factors and health based on the results of investigations and reviews carried out in the period up to 2002.

The new strategy will set forth goals and initiatives for preventing and limiting the negative effects of the environment on our health.

All Danes must be able to live a healthy life. We must be able to drink tap water, walk in the streets, go to work, and live at home in confidence. We must be able to bathe, eat the food sold in shops, and use the products with which we surround ourselves, without being afraid of environmental effects. Although this is largely possible today, there are areas in which the situation could be even better.

We must have a high level of protection, and we must make a special effort regarding particularly vulnerable groups such as pregnant women, children and the elderly.

The strategy provides us with an overview of how the environment affects our health, and how we can solve the problem of negative impacts.

The initiatives must have clear objectives so that we can constantly ensure progress. We must ensure that the authorities cooperate to the greatest extent possible.

In connection with presentation of the strategy, the level of activity in the environment area for 2003 and after will be adjusted, to ensure that the task at hand can be accorded high priority.

The authorities cannot resolve the task alone, however. We all have to share responsibility for ensuring a healthy environment in Denmark. Citizens, enterprises, and organisations must be included and work as partners.

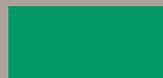
The objective is clear: Cleaner environment - healthier Danes.

Hans Christian Schmidt, Minister for the Environment

Contents

Part I

1	PRINCIPLES AND TEN-POINT PLAN	8
1.1	PRINCIPLES	10
1.2	TEN-POINT PLAN - PRIORITISATION AND ACTION	12



Part II

1	FUNDING AND DELIMITATION OF THE STRATEGY	22
1.1	FUNDING	23
1.2	LIMITATIONS IN RELATION TO OTHER STRATEGIES, ACTION PLANS, ETC	24
1.3	READING GUIDE	25
2	ENVIRONMENTAL FACTORS	26
2.1	CHEMICAL SUBSTANCES	27
2.2	BIOLOGICAL ENVIRONMENTAL FACTORS	29
2.3	PHYSICAL ENVIRONMENTAL FACTORS	29
3	HARMFUL HEALTH EFFECTS	30
3.1	ALLERGIES AND OTHER HYPERSENSITIVITY DISEASES	31
3.2	ASTHMA AND OTHER CHRONIC RESPIRATORY DISORDERS	32
3.3	CANCER	34
3.4	REPRODUCTIVE TOXICITY	35
3.5	ENDOCRINE-DISRUPTING EFFECTS	36
3.6	INJURIES TO THE NERVOUS SYSTEM	38
3.7	INFECTIOUS DISEASES	39
3.8	HEARING DAMAGE AND NOISE-RELATED HEALTH EFFECTS	40
3.9	OTHER EFFECTS	41
4	SOURCES OF ENVIRONMENTAL HEALTH EFFECTS	42
4.1	FOOD	43
4.2	WORKING ENVIRONMENT	45
4.2.1	Chemicals	45
4.2.2	Noise	46
4.3	INDOOR CLIMATE	46
4.4	AIR	48
4.5	WATER	50
4.5.1	Groundwater and drinking water	50
4.5.2	Sea and lakes	51
4.5.3	Swimming pools	52
4.6	Soil	53
4.7	CONSUMER PRODUCTS	54
4.8	NOISE	55
4.9	RADIATION	57
5	CROSS-DISCIPLINARY INITIATIVES	58
5.1	LEVEL OF PROTECTION	59
5.2	REGISTRATION AND MONITORING	60
5.3	RESEARCH - NEEDS AND INITIATIVES	61
5.4	INFORMATION, OPENNESS AND RISK COMMUNICATION	64
6	COOPERATION	66
7	INTERNATIONAL COOPERATION	70



PART 1

STRATEGY AND TEN-POINT PLAN

1



One of the objectives of ensuring a good environment is to limit negative environmental impacts and thereby prevent adverse effects on public health. Examples are the efforts to reduce air pollution or to improve wastewater treatment. Better living conditions, better health and safety in the workplace, information and education, and an improved diet, have also benefited health.

With this strategy the Government wishes to establish an overview of the effect of environmental factors on health and to set forth goals and initiatives for the coming years. Among other things the strategy is intended to create a common framework for enhanced cooperation between the authorities concerning the coming initiatives.

This strategy has several objectives.

First and foremost, the strategy sets human health in focus in relation to the environmental factors that affect us all in our everyday lives, for example via the air, the water and our diet. The strategy is intended to establish an overview and describe objectives and initiatives. What environmental factors affect our health, and how much do they affect us? Where are we exposed to environmental factors, and where do they come from? How can the environmental factors be limited and what must be done in the future to protect human health? What are the authorities doing now and what are they going to do in the years ahead? What can other parts of society do, for example the commercial sector and the individual citizen?

In many areas we have a sound knowledge of how the different environmental factors affect health, but there are also many areas in which we do not know sufficient to take targeted action.

Another objective of the strategy is to integrate and enhance the foundation for the efforts of the various authorities to best protect the population against the various environmental factors. A number of authorities are responsible for different aspects of the impact of environmental factors on health. Within their areas of responsibility they each take initiatives to protect the population. Solving the individual problems requires that the authorities communicate and work together. Good coordination and cooperation between the authorities involved are therefore of great importance. The strategy is intended to create the framework for closer cooperation between the authorities on the basis of their common objectives. It is also important to assess regularly the effectiveness of the measures and ensure that there is a good foundation for decision-making. The Environmental Assessment Institute can contribute to this.

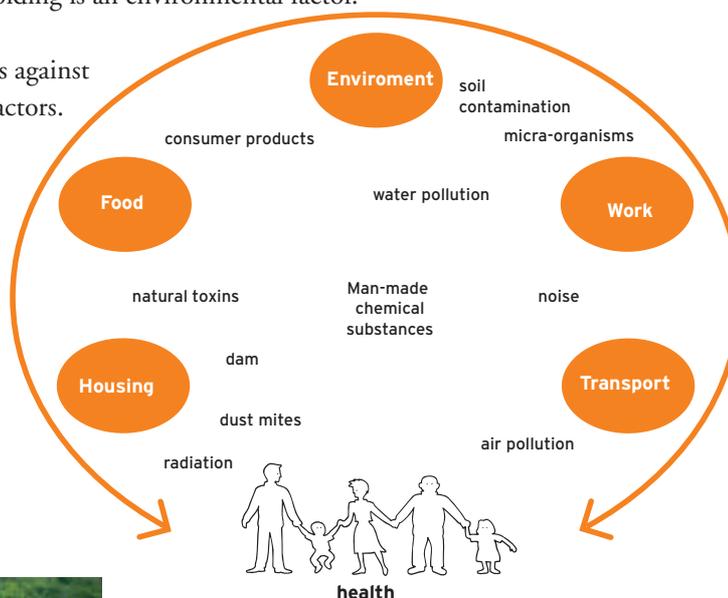
In today's society, human health is affected by both lifestyle factors and environmental factors. Examples of lifestyle factors are tobacco, alcohol, diet, exercise habits, and outdoor recreation. Smoking and alcohol abuse are extremely important factors that can shorten life and affect the general health of the population. The Government has set objectives and initiatives for lifestyle factors in the programme "Life-long health, 2002-2010".

Our health can be affected by environmental factors. Some have positive effects, such as access to outdoor recreational areas, while others can lead to different diseases and hence contribute to premature death. Environmental factors are chemical, physical and/or biological factors in our surroundings, in products, in food, in the working environment or in the indoor climate, see Figure 1. Environmental factors and lifestyle factors can influence each other and intensify the positive or negative effects on health.

It is sometimes difficult to distinguish completely between an environmental factor and a lifestyle factor. Smoking is a lifestyle factor, while passive smoking is regarded as an environmental factor. Another example is sunbathing. It is difficult to avoid ultraviolet radiation when moving about outdoors, and the daily exposure must be regarded as an environmental factor. Actual sunbathing, on the other hand, is regarded as a lifestyle factor. In simple terms, an impact that one chooses oneself is a lifestyle factor, while an impact that the individual has difficulty in avoiding is an environmental factor.

This strategy covers initiatives against the negative environmental factors.

Figure 1. Possible sources of negative impacts on human health from environmental factors. The figure illustrates some of the sources and environmental factors that affect human health



1.1 Principles

The objective of the initiatives against environmental factors that can have a harmful effect on health is to achieve and maintain a high level of protection so as to best safeguard the population against environmental factors in their surroundings, in food, in other products, in the working environment, in the indoor climate, and against harmful chemicals. This also means that children and the elderly or other population groups particularly sensitive to some environmental factors must be accorded special protection. The population must have access to information on the authorities' spheres of responsibility and priorities, and on the initiatives implemented.

The strategy is based on four fundamental principles:

- Everyone must be ensured a high level of protection
- The precautionary principle must be applied
- The adverse effects of environmental factors on health must be prevented
- Information and involvement must be ensured so that everyone can take responsibility for a healthy life

These are the principles behind the efforts to protect the population against environmental factors that can negatively affect health.

Everyone must be ensured a high level of protection

The principle of a high level of protection means that the level of environmental and health protection must be high. Everyone, irrespective of gender and age, must have the possibility of a healthy life without the risk that their health will be unnecessarily affected by environmental factors. For example, people must be able to drink water and live in their homes without putting their health at risk, irrespective of whether they are particularly sensitive to environmental factors due to age, gender, genetic disposition, or during certain periods. This means that special consideration must be paid to some groups – particularly children, pregnant women, and other vulnerable or especially exposed groups.

The precautionary principle must be applied

The precautionary principle must be incorporated into the overall assessment to achieve a high level of protection. The precautionary principle stems from a desire to protect people and nature, even in the absence of comprehensive scientific proof of harmful effects and their magnitude. The precautionary principle is an important political principle that is acknowledged by the EU and in Danish policy.

The principle must be applied when it is suspected that something constitutes an unacceptable risk to the environment or human health, but where the scientific foundation is inadequate and cannot be improved within an acceptable time frame.

An example of how the precautionary principle has been incorporated in decision-making is the initiatives concerning phthalates, including the provisions on phthalates in toys.

The adverse effects of environmental factors on health must be prevented

The environment and health initiative must be preventive and must contribute to sustainable development. People's health must not be gradually impaired through polluted food, the emission of harmful substances to the environment, indoor climate, the working environment or via consumer products.

Prevention can be achieved by employing the substitution principle to replace hazardous chemicals with less hazardous ones. We must find a balance where both the selection of hazardous chemicals and their use are limited to what is necessary to avoid products that contain chemical substances that are actually unnecessary to the function of the product. The authorities, enterprises, and the general public all have a responsibility. Prevention can also be achieved by identifying and using technologies that have less impact on the environment, and thereby on health.

We must avoid pathogenic organisms in drinking water, food, bathing water, wastewater, and sludge. Quality standards or limit values must be set for micro-organisms so as to avoid diseases. The high level of hygiene must be preserved.

Information and involvement must be ensured so that everyone can take responsibility for a healthy life

The question of the possible negative impacts of environmental factors on health can give cause for concern. Information on the significance of environmental factors for health and the regulations that apply is therefore of great importance. It is vital for people to have easy access to such information, for example information about the substances contained in the products and food that we use, or information about what we ourselves can do in our daily lives to avoid environmental factors that affect our health.

Everyone shares responsibility and we must work together if we are to reduce the adverse effects of environmental factors on health, and if we are to make knowledge and information available. Authorities, consumers, manufacturers, the retail trade, and employers and employees in enterprises each have a responsibility.

The authorities are responsible for ensuring the possibilities for a healthy life. Among other things, this means requirements to enterprises and manufacturers and information to consumers. Consumers must be able to expect that the goods they purchase are not harmful to health. Consumers must be informed by the authorities and other bodies in such a way that they can respond to the information they receive and thereby share responsibility for their own health. There must be easy access to independent cross-disciplinary information on topics concerning the environment and health.



1.2 Ten-point plan - prioritisation and action

The series of initiatives that this strategy identifies are collated and prioritised in a ten-point plan. The plan focuses on the creation and dispersion of the harmful environmental factors, e.g. via the air, water or food, and it deals with special impacts in relation to protecting public health in the years to come. Finally, the plan focuses on cross-sectoral and international cooperation, since such cooperation is necessary for an effective effort.

The ten-point plan is to help achieve the goals set - including long-term goals. The different elements in the ten-point plan have not been ranked according to priority.

Ten-point plan

1. Negative impacts from chemicals are to be reduced, and the substitution of hazardous substances by less hazardous ones must be accelerated
2. The incidence of allergy and respiratory disorders is to be reduced
3. Measures directed at endocrine-disrupting substances are to be intensified
4. Noise nuisance is to be reduced
5. The negative impacts on health from air pollution and from the indoor climate are to be reduced
6. Food is to be safe and free from pollution
7. Groundwater and drinking water must be protected
8. Research into the significance of environmental factors on health is to be enhanced
9. Cooperation between the authorities must be strengthened
10. Increased attention must be accorded to environmental factors and health in international cooperation

It is necessary to prioritise the initiatives in order to achieve the greatest possible effect on health with the resources available. In prioritising the initiatives, emphasis is placed on reducing a number of environmental impacts that can have serious effects on health (deaths, serious disease), or that affect large numbers of people (e.g. noise). Emphasis is also placed on the long-term perspective through the initiatives aimed at prevention and the maintenance of a high level of protection. The initiatives are focussed through a concerted build-up of knowledge in important areas.

The prioritisation also reflects the fact that some issues are global in nature, thus necessitating active Danish participation in international cooperation in this area.

The concrete initiatives are to be implemented in the most effective manner. The costs and benefits of the individual initiatives will be evaluated regularly. With the report "Making markets work for environmental policies - achieving cost-effective solutions" the Government has indicated an environmental policy shift towards cost-effective solutions when achieving environmental objectives and increased use of market forces.

1. Negative impacts from chemicals are to be reduced, and the substitution of hazardous substances by less hazardous ones must be accelerated

It is known that some chemical substances have harmful effects on health. It is difficult to assess the overall health impact for the population, though, because knowledge of the effects of many chemicals is inadequate.

In Denmark we currently use around 20,000 chemical substances that are constituents in an even greater number of products and goods. We use more and more substances because they often improve the products' properties or characteristics. The population is therefore increasingly encountering chemicals in everyday life. Chemical substances are found in products and the environment and can occur as pollutants, for example in food, in the indoor climate and in the working environment. Chemicals are spread across national borders. As a consequence, protection against hazardous chemicals is not just a national matter.

The objective is to reduce the negative effects of chemicals and to substitute as many hazardous chemicals as possible with less hazardous ones. The Government has set the goal that no products or goods should be on the market in 2020 that contain chemicals having particularly problematic effects on health and the environment. Products and goods will continue to contain harmful chemical substances for many years to come. The treatment of these products when they become waste must not give rise to any problematic effects on health and the environment. A further vision for 2020 is that no employee should be exposed to harmful effects of heavy metals, carcinogens, organic solvents or other hazardous chemicals in the workplace.

The first step in reducing the negative impact of chemicals is to phase out the most harmful substances and the hazardous substances that are used in large amounts. Targeted action must be taken globally, regionally in the EU, and nationally. A primary need is therefore for more data on the effects of the substances so as to have a better basis for selecting those for which action needs to be taken. In order to enhance the effectiveness of the efforts and also avoid unnecessary testing on animals, we must make greater use of computer modelling and alternative, simple test methods to predict the effects of the substances. In its Budget for 2002 and the following two years the Government has allocated special funds to enhance efforts to limit the negative impact of chemicals on health and the environment.

Authorities, manufacturers, and employers must phase out or reduce the use of hazardous substances. The authorities will use a variety of instruments, including banning particularly hazardous substances or regulation to restrict their use. Special groups of substances such as pesticides and biocides have to be approved before use. The Cleaner Product Programme will support the development of alternatives and cleaner production methods. One tool for phasing out or substituting hazardous substances with less hazardous ones is the official lists of problematic substances.

Manufacturers, suppliers, importers, and employers have a particular responsibility for ensuring that the least hazardous appropriate substances are used in production and products, and that products and foods are not polluted by undesirable substances. Industry must be made responsible for investigating the toxicity of chemicals and for ensuring that the chemicals used do not harm the environment and human health. Retailers are responsible for making use of the information provided by the manufacturers and for ensuring that the consumers are informed in the best possible way about the safest way to use the products they sell. Retailers and consumers must be able to make a conscious choice about what they wish to sell and buy. Moreover, consumers should be given ample opportunity to choose products that have as few adverse effects as possible on the environment and health. Enterprises using chemicals must involve their employees in the task of reviewing the use of chemicals and of substituting hazardous chemicals with less hazardous ones.

2. The incidence of allergy and respiratory disorders is to be reduced

Both allergy and respiratory disorders affect many people in their day-to-day lives. The incidence of these diseases is increasing. The precise reasons for this are not yet known, however. Some people are genetically disposed to allergies and chronic respiratory diseases. The effects of chemicals, food, fine particles, and micro-organisms can evoke or promote the development of allergies and exacerbate the disorder in allergic people.

The reasons why an increasing number of people suffer from allergies need to be better understood.

The objective is to phase out substances that cause or exacerbate allergies, especially from consumer products, the working environment, food products, and the indoor climate, so as to reverse the trend and reduce the incidence of allergy and respiratory disorders. One of the means of achieving this will be that products containing allergenic substances will have to be labelled so that consumers can choose whether they want to purchase these products, and so that manufacturers can use alternative substances. At the same time, the basis for reducing the number of cases of allergies caused by chemical substances in consumer products is to be improved. The Ministry of the Environment has therefore established a National Allergy Research Center for Consumer Products. Furthermore, the Ministry of the Environment will intensify the use of computer models to identify more rapidly the substances that are allergenic. In the EU, Denmark will work towards the future introduction of positive lists, for example for hair dye. During the Danish Presidency an agreement was reached that allergenic perfumes must be declared on cosmetic products. Denmark will work for the introduction of similar regulations requiring the labelling of allergenic perfumes in detergents and cleaning agents. Such a proposal has been put forward in the EU.

In addition, activities to improve the air quality in relation to outdoor air pollution and the indoor climate will be vital for people suffering from respiratory disorders and hypersensitivity diseases (see point 5).

The Government will draw up a strategy for hypersensitivity diseases (asthma and allergies).

3. Measures directed at endocrine-disrupting substances are to be intensified

Observations in the environment have shown that chemical substances with endocrine disrupting properties can affect reproduction in animals. In humans the substances are suspected of being partly responsible for damage to reproduction and for the increasing number of cases of cancer. If the suspicion is correct and the development continues, this will have consequences for our future. It is particularly the effect of endocrine disrupters during vulnerable periods such as the foetal period that are of significance for the development of diseases later in life.

Research on potential endocrine disrupters and their possible effects needs to be enhanced.

The objective is to identify and thereafter substitute the endocrine disrupters in products so as to reduce their occurrence in our surroundings.

One of the means of pursuing this objective is active support for the EU Strategy for Endocrine Disrupters, which includes assessing and prioritising the most problematic substances. The Ministry of the Environment, the Ministry of Food, Agriculture and Fisheries, the Ministry of Employment and the Ministry of the Interior and Health will strengthen cooperation to identify and then replace the most problematic substances and the substances to which we are most exposed. Research needs to be strengthened on the relationship between exposure to endocrine disrupting chemicals and effects on health. It is vital to develop better methods for testing substances for endocrine disrupting effects so as to determine more rapidly which substances have such effects.

4. Noise nuisance is to be reduced

High noise levels can cause hearing damage and increase the incidence of stress-related diseases. At workplaces high noise levels are still a serious problem, although it is decreasing. Around 1,800 cases of work-related hearing damage are still reported each year. Children's institutions are often plagued by high noise levels. Road traffic is the main source of noise nuisance outside and in homes.

The objective is to protect the population and employees as far as possible against loud and bothersome noise. In 2003, the Government will publish a strategy aimed at reducing noise from road traffic (Road Noise Strategy). The Road Noise Strategy will help ensure a good basis for the implementation of the EU Environmental Noise Directive. The foundation for drawing up the strategy will include an analysis of the costs and benefits of regulating noise.

The National Agency for Enterprise and Housing will reassess the noise-related requirements for new buildings. The assessment is intended to e.g. contribute to a reduction in noise from neighbouring flats in multi-storey housing and to improvement of the acoustic conditions in children's institutions and schools.

Up to the year 2005, the National Working Environment Authority will accord high priority to noise levels that can cause hearing damage, focusing particular attention on noise in day-care centres. Special initiatives must be taken against sectors of industry where noise can occur at levels that damage hearing, e.g. the metalworking and the engineering industry. In addition, the National Working Environment Authority will review very noisy machines and work processes where it is not currently possible to attenuate the noise sufficiently so that future initiatives can be better focussed.

5. The negative impacts on health from air pollution and from the indoor climate are to be reduced

We must reduce emissions of harmful substances from vehicles in our towns. The Government is aiming for a 50% reduction in particulate emissions from traffic in towns by the year 2010. Implementation of an EU directive means that Denmark must reduce its emissions of sulphur dioxides (SO₂), nitric oxides (NO_x), volatile organic hydrocarbons (VOCs) and ammonia before 2010. The Government aims to reduce emissions of NO_x and hydrocarbons from the transport sector by 60% by 2010 relative to the level in 1988.

The relationship between particulate pollution and harmful health effects is well documented. However, there is a need to know more about how individual sources of pollution contribute to human exposure to fine and ultra-fine particulates and to know more about the health effects related to emissions from these sources - especially in a Danish context. It is important to gain more knowledge about these relationships in order to identify particularly pollutant sources, other than diesel-driven vehicles, and in order to give more precise assessments of the health benefits of specific measures against the individual sources of pollution.

Most people spend approximately 90% of their time indoors. The indoor climate is therefore of great importance to our health and well-being. Ventilation conditions, heat, damp in buildings and humid air are the most important factors for the indoor climate and for conditions for house dust mites and mould fungus. A poor indoor climate can also be caused by animal hair, wood-burning stoves, cooking odour, tobacco smoke and chemical substances that evaporate from building materials and furniture, cleaning agents and other chemical products. Some

environmental factors in the indoor climate can be allergenic, e.g. house dust mites and animal hair, while others are irritants.

The objective is to reduce the adverse effects of the indoor climate on health as much as possible.

Radon, which is a naturally occurring radioactive gas present everywhere underground, is a contributory cause of approx. 300 new cases of lung cancer each year. Approx. 1/6 of these cases occur in non-smokers. The main means of reducing radon levels in buildings are to ensure that they are insulated from the ground and well ventilated.

An important means of achieving this objective in future will be a coordinated, enhanced effort by the authorities. Information activities must be intensified to inform the public on how to improve the indoor climate at home, e.g. through building design, building use, maintenance, ventilation and cleaning. At workplaces, supervision of compliance with the regulations must be enhanced. There is also a need for more research in order to gain greater insight into how and to what extent the different environmental factors in the indoor climate affect us and thereby enhance the possibilities for preventing negative effects on health from indoor-climate problems.

6. Food is to be safe and free from pollution

Food can be polluted with harmful chemical substances. Some substances are more problematic than others because they are persistent and accumulate in the food chain.

The objective is to ensure consumers access to safe and unpolluted food. It is important to prevent food from being polluted. This will be achieved by taking action directed at the source of the pollution. Many food products are imported and it is therefore important that efforts are continued internationally to promote food safety and to impose strict requirements concerning emissions and the use of the most problematic chemical substances.

Besides reducing pollution at source, one of the main means of achieving the objective is the setting of limit values for undesirable chemical substances. Limit values for the residual concentrations in food have been set for a number of heavy metals, pesticides, veterinary medicines, food additives and some of the chemicals that can be released from food packaging. The Ministry of Food, Agriculture and Fisheries will adjust existing limit values and set new ones, as new knowledge is acquired. Denmark is working actively for the introduction of limit values for all types of chemical contaminants in both Danish and imported food. All limit values will be established according to the precautionary principle and they will be set as low as possible. The authorities will monitor compliance with current limit values and ensure good information about the quality and safety of food. The food manufacturers are responsible for complying with the regulations on safety and quality.

In 2000 and 2001, the Ministry of Food, Agriculture and Fisheries and the Ministry of the Environment published action plans to reduce dioxin and dioxin-like substances in food. For example, extensive monitoring of the occurrence of dioxins in fish caught in Danish waters is to be initiated so that fishery at particularly polluted "hotspots" can be banned if necessary. From 2005 onwards, waste incineration plants, which are one of the major sources of dioxin emissions, must comply with a more stringent limit value for the amount of dioxin they are permitted to emit.

7. Groundwater and drinking water must be protected

In most places in Denmark the groundwater is so pure that it can be used directly as drinking water. However, there are areas where the groundwater is at risk from pesticides leaching down through the soil. Drinking water can also be polluted by metals and chemicals emitted from water pipes and taps in homes.

The Government's objective is for Danes to be able to continue using untreated groundwater as drinking water and to be in no doubt as to the quality of their drinking water with respect to pesticide residues, other chemical substances, and microbiological pollution. In Denmark, the principle is that there must be no pesticide residues in groundwater at levels exceeding the limit value.

The main instruments for protecting the groundwater against pesticides are to ban or restrict the use of pesticides that can threaten the groundwater. In the past few years, many pesticide active ingredients that can threaten the groundwater have been banned. These efforts will continue.

The warning system for groundwater monitoring is an important initiative in this context. The warning system provides the possibility for rapid intervention in the form of reassessment, and a ban or use restrictions in the case of approved pesticides that contaminate the groundwater.

The consumption of pesticides can be reduced while also ensuring economically viable agricultural production. In 2003 a new target will be set to reduce further the application frequency. In addition, the Ministry of the Environment and the Ministry of Food, Agriculture and Fisheries are in the process of identifying areas that are particularly vulnerable to leaching of pesticides.

The quality of our drinking water must not be impaired by substances released from water pipes and taps. The National Agency for Enterprise and Housing and the Ministry of the Environment will therefore reassess the present national approvals with a view to raising the level of protection and ensuring that the concentrations of metals given off by installations do not exceed the drinking water standards.

8. Research into the significance of environmental factors on health is to be enhanced

Research into the relationship between environmental factors and health is important. Greater understanding of causal relationships, mechanisms, exposure and effects of different environmental factors will provide a better basis for planning preventive action against problematic chemicals and other environmental factors. The Danish Strategic Environmental Research Programme has been providing more knowledge in this area for a number of years. This programme has now been concluded.

The objective is that research into the relationship between environmental factors and health is to be continued. It is necessary that the future research initiatives consider important issues such as the significance of the negative effects of chemicals for the individual, combination effects, and the development of effective methods for testing and assessing chemical substances. In this connection, areas of research that will be accorded high priority are endocrine disrupting effects, allergies, and fine and ultra-fine particles.

There is already extensive monitoring and registration of a number of environmental factors and the incidence of various diseases. The objective is to enhance our knowledge of relationships between environmental factors and health so as to obtain the necessary documentation to inform and focus efforts where they will have the greatest effect. In order to better understand the relationship between environmental factors and health, the authorities will analyse and clarify the possibility of obtaining more information by parallel processing databases containing environmental and geographical information with health databases.

A cross-disciplinary group will be appointed to develop a comprehensive set of indicators illustrating the relationship between environmental factors and health. Among other things the objective is to establish a permanent system for monitoring environment-related health risks.

9. Cooperation between the authorities must be strengthened

Various authorities are responsible for specific tasks concerning environment, food, the working environment, indoor climate, traffic, and public health in general. These are complex areas, where regulation necessitates considerable knowledge about sources of pollution and impact on human health, the magnitude of the impacts, the dangerousness of environmental impacts, and knowledge about public health. It is therefore important to optimise cooperation between the administrative authorities and the research centres so as to maximize the effect of the efforts.

It can be difficult for the individual citizen to obtain a clear picture of what can affect one's health and to what extent, what initiatives the authorities have implemented and, particularly, what one can do oneself to avoid various substances and products and thus reduce possible harmful effects on health. People's environmental rights are assured through such legislation as the Act on Access to Public Records, rules on citizen involvement, and the right of appeal in the various environmental laws.

The objective is to ensure that action is centred on people and the impacts to which they are exposed and that integrated and prioritised action is taken across the board to regulate and reduce impacts on public health. Research centres must also cooperate and coordinate their activities so that society benefits optimally from their work. Authorities, manufacturers, employers, and the media must all participate in disseminating information about the risks in a useful and well-balanced way so that people can act appropriately to prevent and reduce risk.

As a means of achieving these objectives the government will accord importance to strengthening wide-ranging cooperation on the question of environmental factors and health. It is proposed that a coordinating working group should be established between the authorities to ensure coordinated and integrated action against environmental factors that can affect health. The working group is to follow up and ensure the implementation of this Strategy for environmental factors and health, for example in such cross-disciplinary areas as stipulating the level of protection and setting limit values. In this context, there may be a need to involve other players, e.g. from regional and municipal authorities, medical health officers, industry, research and organisations. The work is to be based on environmental, health, and economic considerations so as to maximise the benefits obtained for the investment. The Working Group will also act as an "umbrella" for a wide range of cooperation fora in specific areas. The Working Group will prepare a report on the progress of the work by the end of 2005, including a proposal for future priority areas.

On the communications side, the authorities' objective is to provide good and relevant information on environmental factors and health and to establish a mutually beneficial dialogue with business and individuals. People are to be provided information on health risks in such a way as to enable them to assess the significance of environmental factors for health and thereby help prioritise the initiatives. At the same time, people are to be assured easy access to the information they seek.

10. Increased attention must be accorded to environmental factors and health in international cooperation

For many years now, the effect of environmental factors on human health has become increasingly dependent on international conditions. Many food products, chemicals, and goods are produced elsewhere in the world and imported to Denmark. Moreover, we can be affected by pollution in other countries and continents. Examples are the hole in the ozone layer over the Antarctic caused by emissions of ozone-depleting substances or transboundary atmospheric pollution. The task of protecting health against environmental factors must therefore also be solved in international cooperation.

The objective is that Denmark makes active international efforts and provides environmental assistance aimed at helping to solve global, regional, and local problems.

The main means of achieving this objective include Denmark's participation in the international regulation aimed at protecting and improving health. This applies both in the EU, the UN and other international fora. Denmark will strive to ensure that global cooperation in the chemicals area is successful. Moreover, Denmark and the EU accord high priority to cross-disciplinary action for health, the environment, and combating poverty, including initiatives in such areas as water and energy



PART 2

Funding and delimitation of the Strategy

1





1.1 Funding

This is the first time that Denmark has prepared a strategy for environmental factors and health. The Strategy sets the framework for initiatives in the forthcoming years. The Strategy will ensure that the combined initiatives for the area are targeted, and focus on a cross-disciplinary perspective. A number of the initiatives in the Strategy will be funded through individual ministries' normal appropriation in the Danish Finance Act. In 2002 and up to 2004, additional special funds have been allocated in the Danish Finance Act. These funds will also finance new common initiatives. For example, a reserve of DKK 1.5 million has been allocated to the proposed coordinating working group. In addition, funds have been set aside to ensure independent, consumer-oriented information initiatives.

For areas covered by the Ministry of the Environment, DKK 55 million have been allocated in the Danish Finance Act for the period 2002-2004 for the chemicals area, and for the environment and health. DKK 57.2 million have been appropriated to the areas covered by the Ministry of Food, Agriculture and Fisheries for 2002-2004, specially aimed at retaining a high level of food safety. These funds will be used to fund activities under the Strategy, and they will also fund activities outside the Strategy.

Correspondingly, the Ministry of Economic and Business Affairs has received resources from the Danish Finance Act for initiatives aiming at the indoor climate and drinking-water installations. The Ministry of the Interior and the Ministry of Health have about DKK 20 million to pay for new initiatives, including following up four action plans that appear in the government's programme; cardiovascular diseases, hypersensitivity diseases, type-2 diabetes, and osteoporosis (brittle bones).

For areas covered by the National Working Environment Authority, chemicals, noise, and indoor climate comprise priority visions in the "Action Plan for a Clean Working Environment - 2005". Through this Action Plan, there is focus on these areas in normal inspections carried out by the National Working Environment Authority in the relevant sectors. Furthermore, in connection with a supplementary action plan, DKK 45 million have been allocated for extra initiatives for ten new especially exposed groups of jobs for 2001-2004, and noise and indoor climate are particularly relevant for six of these groups.

The objectives and initiatives in the strategy will be followed up by concrete initiatives and action plans within the areas concerned. A decision about new expenditures in connection with the new initiatives requires the preparation of a concrete decision-making basis to assess the benefits and costs.



1.2 Limitations in relation to other strategies, action plans, etc.

The government has set objectives and initiatives for lifestyle factors in the programme "Life-long health, 2002-2010". Therefore, this Strategy does not address lifestyle factors such as smoking, alcohol, diet, and exercise, which are more significant factors for the health of the population as a whole.

The Ministry of Food, Agriculture and Fisheries has a number of strategies and action plans to limit the occurrence of pathogenic bacteria in food. Problems regarding production processes and the health of livestock in agriculture are not covered by this Strategy. The application of gene technology in food production is only included to a limited extent in the Strategy, as it is addressed in a number of other inter-ministerial fora.

The Strategy addresses working-environment factors that are also included in the action programme "Clean Working Environment 2005". On the other hand, the initiatives in the Action Programme to prevent other significant impacts on the health and safety of employees are not covered by the concept of environmental factors, and are thus not part of this Strategy. For example, this applies for industrial accidents, impacts on the musculoskeletal system, and psychosocial impacts, as well as children and young people at work.

The Strategy addresses chemicals in respect of their harmful effects. This is also part of the overall Chemicals Strategy. In addition to this, the Chemicals Strategy sets the framework for the overall chemicals initiatives towards xenobiotic substances and their effects on plants, animals, and aquatic organisms, as well as substances that affect the atmosphere. A number of other strategies for the environment are also contributing to limiting unacceptable impacts on human health.



1.3 Reading guide

Part II describes the series of initiatives the government will initiate in the coming years to reduce the negative impacts on public health.

Section 2 describes the initiatives towards the various environmental factors. *These are chemicals, biological factors, and physical environmental factors.*

Section 3 describes initiatives towards the health effects that can be caused by environmental factors.

Section 4 describes the initiatives towards the different sources of environmental factors.

Section 5 describes initiatives within cross-disciplinary areas such as retention of a high level of protection, monitoring, and knowledge building.

Section 6 describes initiatives to enhance cooperation between the authorities in different areas.

Section 7 describes international initiatives.

Environmental factors

2



Environmental factors is a generic term for a number of chemical, biological, and physical factors to which we are exposed in the environment, via food, at work, and during our leisure time, and which can affect our health.



2.1 Chemical substances

Chemicals can provide many advantages but they also entail a number of disadvantages. Some chemicals can have undesirable effects, such as carcinogenic effects, reproductive effects, mutagenic effects, or allergenic effects, or they can affect vulnerable ecosystems. The negative impact from chemicals has increased dramatically over the past 50 years. We currently use more chemical substances, in greater quantities, and in a much larger number of applications than ever before. The goal is that by 2020, no products or goods on the market will contain chemicals with highly problematic effects on health or the environment.

Objectives and activities in the near future

The primary objectives are to reduce the environmental impacts from chemicals; to phase out or limit particularly harmful chemical substances; to build knowledge about the harmful effects of chemical substances in order to prioritise initiatives; and to develop new methods to acquire data on effects on health.

International, active and future-oriented initiatives in the chemicals field are imperative, because chemicals disperse across borders - primarily through trade in goods, but also via the environment.

Initiatives regarding chemicals will therefore continue at three levels; in Denmark, in the EU, and globally.

At global level, Denmark will continue its work to promote the implementation of chemical conventions, already adopted and signed, to phase out particularly harmful substances. This applies to the Rotterdam Convention on Prior Informed Consent, PIC, and the Stockholm Convention on Persistent Organic Pollutants, POP. Furthermore, Denmark will work to create a global convention on heavy metals, where mercury is the first metal to be addressed.

1) Carcinogenic, mutagenic, and substances toxic to reproduction



Through the EU, Denmark will be active in the chemicals field so that up to 2020 we phase out chemicals with especially problematic effects on the environment and health, for example carcinogenic effects, reproductive effects, mutagenic effects or harmful effects on vulnerable ecosystems. In connection with the new EU strategy on chemicals, Denmark will place special emphasis on initiatives to improve knowledge about the effects and occurrence of chemicals, and how chemicals are used in products. The Strategy includes the REACH system (Registration Evaluation and Authorisation of Chemicals). The system is based on registering and assessing chemical substances. Moreover, REACH includes an authorisation scheme where the most hazardous substances (CMR substances and POPs) are automatically banned unless authorised for a special application. Denmark will continue work to bring endocrine disruptors and other especially problematic substances under the authorisation scheme. Furthermore, bioaccumulating and persistent toxic substances should also be included in this scheme. Finally, substances produced in quantities of less than one tonne should be covered by a simple registration scheme that makes it possible to identify especially problematic substances. Another objective is that substances without data should not be marketed in the EU.

The Ministry of the Environment will continue work on preparing lists of problematic chemical substances that can guide work on substituting problematic substances with less harmful ones. Similar endeavours will take place within the working environment field.

On the basis of the current investigation of sources of dioxins, the Ministry of the Environment and the Ministry of Food, Agriculture and Fisheries will establish and implement measures to reduce as far as possible exposure of people to dioxins and dioxin-like substances.

Computer-aided assessments of substances will be further developed. In cooperation with the Ministry of the Interior and Health, the Ministry of Food, Agriculture and Fisheries, the Ministry of Employment, the Ministry of Economic and Business Affairs, and the Ministry of Transport, the Ministry of the Environment will assess whether the results of computer modelling (for example QSAR assessments) can be applied in existing legislation.

The Ministry of the Environment and the Ministry of Employment will use a common product register as part of work to monitor and replace dangerous substances with less hazardous ones.



2.2 Biological environmental factors

People are exposed to biological impacts in the external environment, the working environment, the indoor climate, and through contact with a large number of products, primarily food and water. Some micro-organisms can result in serious diseases, while others do not cause health problems.

Objectives and activities in the near future

The objective is to ensure a high level of protection by reducing the pathogenic micro-organisms to a level that will not cause effects harmful to health.

Please see sections 3.7 Infectious diseases, 4.2 The working environment, 4.5 Water, and 5.3 Research – needs and initiatives.



2.3 Physical environmental factors

Noise, radiation, and particles in the air are all physical environmental factors that can negatively affect health. However, the effects and the sources are different.

Objectives and activities in the near future

For noise, the overall objective is to remove or silence sources of noise that emit noise above the limit values.

For radiation, the overall objective is to reduce the harmful effects of radiation on humans as far as possible, including through consultancy.

For air, the overall objective is to achieve air quality where emissions of substances harmful to health affect people as little as possible.

Please see sections 4.2 The working environment, 4.4 Air, 4.8 Noise, 4.9 Radiation, and 5.3 Research – needs and initiatives.

Harmful health effects

3



Exposure to environmental factors can cause nuisance, temporary harmful health effects, or permanent irremediable injury. The following is primarily a description of goals and initiatives towards the more serious effects.



3.1 Allergies and other hypersensitivity diseases

The incidence of hypersensitivity diseases has been increasing in recent years and today these diseases are extremely widespread. The increase, which is primarily seen in the Western world, seems most likely to be due to environmental and life-style changes, however, there is a need for more accurate knowledge about the factors causing the increased incidence. Either separately or in interplay, environmental factors in the indoor climate, in the air, in food, in consumer products, and in the working environment can contribute to causing or aggravating allergies. The Ministry of the Environment has established a National Allergy Research Center for Consumer Products that is to provide an overview of the scope and causes of allergies to chemical substances in consumer products. This will create the basis for enhanced prevention initiatives, including more targeted initiatives and information on the subject.

Objectives and initiatives in the near future

The overall objective is to reverse the trend of increasing numbers of new hypersensitivity and allergy cases due to environmental factors.

As a part of its national strategies and objectives for public health 2002-2010, the government will draw up a strategy for hypersensitivity diseases (asthma and allergies).

The Ministry of the Interior and Health will examine possible ways of ensuring that systematic, uniform, and extensive registration and monitoring of allergies can be carried out in the future, including possible ways of incorporating data from the primary health sector.

The initiatives to prevent allergies caused by chemical substances in consumer products will be enhanced via allocated funding in the Danish Finance Act 2002-2004. The National Allergy Research Center for Consumer Products will continue its work on creating a solid and scientific basis for monitoring the area and strengthened initiatives to prevent allergies caused by

chemical substances in consumer products. In this connection, a clinical database is being established, in which data from the primary health sector are also included. The database will in time become a national database and experience will be useful e.g. as a model for quality improvement of the registration and database development that the government wants for the rest of the hypersensitivity area, see the paragraph above.

Initiatives regarding allergenic substances should be seen in context with international initiatives towards chemicals in general, see section 2.1. Denmark's many years' work within the EU to have allergenic substances identified and classified must be continued.

Consumers must be able to protect themselves against allergenic substances in products applied directly to the skin. On the basis of e.g. Danish initiatives, in 2004 new rules on the declaration of perfumes in cosmetics will enter into force throughout the EU.

Allergenic substances must be identified. Furthermore, the Ministry of the Environment will continue the use of computer models (QSAR) to identify the substances that are allergenic. The Ministry of Employment will include allergies in initiatives against chemicals to a greater extent.

In the years to come, research and development will make up part of the basis for the preventive initiatives against allergenic substances. Important areas are:

- * combination effects of irritating substances and allergenic substances in the working environment, * tools to assess chemical substances' possible allergenic properties, and public exposure to the substances.



3.2 Asthma and other chronic respiratory disorders

A large part of the population suffer from chronic respiratory disorders such as asthma and chronic obstructive pulmonary disease. The incidence of these diseases seems to be increasing. To different extents, they lead to limitations in day-to-day living and deteriorate the quality of life. More Danish women die from these diseases than in countries comparable to Denmark. Environmental factors, but also life-style factors, are deemed to be significant causes. Research and improved registration and monitoring must be ensured in order to target and enhance preventive initiatives against these disorders. Strengthened

efforts to improve the indoor climate are also important, as several environmental factors in the indoor climate can contribute to causing or aggravating allergenic respiratory disorders. More efforts to reduce air contents of fine and ultra-fine particles are likewise important, as reduced levels of particles will benefit e.g. the many people that suffer from respiratory disorders. The National Allergy Research Center for Consumer Products providing information on allergies to chemical substances in consumer products will help elucidate the possible significance of chemical substances to allergies.

Objectives and initiatives in the near future

The overall objective is to map and reverse the trends in the incidence of environment-related asthma and other chronic respiratory disorders.

As a part of its national strategies and objectives for public health 2002-2010, the government will draw up a strategy for initiatives regarding hypersensitivity diseases (asthma and allergies). Initiatives pertaining to smoking and early preventive treatment of asthma and allergies in children will be continued.

The Ministry of the Interior and Health will examine possible ways of ensuring that systematic, uniform, and extensive registration and monitoring of the above respiratory disorders can be carried out in future, including possible ways of incorporating data from the primary health sector. The work will be done in order to achieve enhanced and better-targeted preventive initiatives. Experience gained from the establishment of a clinical database at the National Allergy Research Center for Consumer Products will serve as a model for this work.

There is a need for more knowledge about the significance of outdoor air pollution. In the Danish Finance Act 2002-2004, the Ministry of the Environment has allocated funds to more targeted initiatives against particulate air pollution, especially pollution caused by fine and ultra-fine particles.

There is a need for more knowledge and better-targeted initiatives pertaining to the indoor climate in order to prevent respiratory allergies and reduce nuisance and symptoms among people suffering from respiratory disorders (see section 4.3).

Research and development will make up part of the basis for the preventive initiatives against substances that can cause asthma and respiratory diseases. In addition to this, it is also important to examine how substances with adjuvant effects influence the incidence of allergic respiratory diseases.



3.3 Cancer

The incidence of cancer cases is increasing. The most important reasons for this trend are life-style changes and increasing average lifetimes. However, environmental factors also contribute to increasing the risk of cancer. In continuation of the existing initiatives, the objective is to identify, examine, and minimise environmental factors that can contribute to increasing the cancer risk.

Objectives and initiatives in the near future

The overall objective is to minimise the incidence of preventable environment-related cancer by continuing existing initiatives to identify, examine and minimise chemical and physical environmental factors that increase the risk of cancer.

Initiatives regarding carcinogenic substances should be seen in context with international initiatives towards chemicals in general, see section 2.1. Carcinogenic substances must be identified. Denmark will continue the work to have carcinogenic substances identified and regulated in the EU, since previous initiatives have proven to be an effective means of reducing use of carcinogenic substances.

Exposure to radon in homes must be reduced. The National Board of Health and the National Agency for Enterprise and Housing will still be concentrating on activities that can help reduce the radon level in existing buildings.

In order to reduce the incidence of cancer, exposure to fine and ultra-fine particles from traffic must be reduced. The Ministry of the Environment has started projects to elucidate how to best reduce fine and ultra-fine particulates in air. See section 4.4. on air.

The relationship between exposure to environmental factors and cancer must be elucidated. The Ministry of the Environment and the National Board of Health in cooperation with the Ministry of Food, Agriculture and Fisheries and the Ministry of Employment will examine whether parallel processing of existing registers containing information on cancer incidences and special occurrences of certain environmental factors can suggest possible relationships in selected areas in Denmark. See section 5.2 on registration and monitoring.

In the years to come, research and development will make up part of the basis for the preventive initiatives against carcinogenic substances. This also includes carcinogenic substances formed during food preparation, e.g. acrylamide. To begin with, it will be important to identify

clear relationships between environmental factors and cancer and the significance of genetic susceptibility.

Research funding of DKK 5.8 million have been allocated to a large research project that is to examine the formation and occurrence of acrylamide in food products. The objective is to be able to control and reduce the formation of acrylamide during commercial food production and to provide consumers with information on how best to reduce the content of acrylamide in the food they prepare at home. The project will continue until 2006.



3.4 Effects on Reproduction (reproductive toxicity)

Reproductive toxicity means e.g. reduced reproduction ability, birth defects and developmental effects later in life. Environmental factors contribute to reproductive toxicity. Ionising radiation and some chemicals can be directly toxic to the reproductive organs and the foetus, if proper preventive measures are not maintained. Some chemicals can be endocrine-disrupting and may therefore have toxic effects on the reproductive system. In the long-term perspective, this may present a serious problem to society. The objective is to continue to identify, examine, and minimise environmental factors that reduce the ability to give birth to healthy babies.

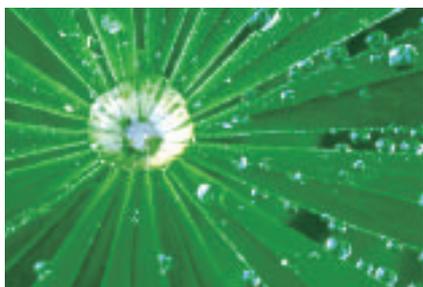
Objectives and initiatives in the near future

The overall objective is to prevent exposure to environmental factors from adversely influencing reproduction and/or the baby.

Initiatives regarding substances that can be toxic to reproduction should be seen in context with initiatives towards chemicals in general, see section 2.1. Denmark will continue the work to have substances that are toxic to reproduction identified and regulated in the EU, since previous initiatives have proven to be an effective means of reducing use of these substances. For more, please see section 3.5. on endocrine disrupters.

The relationship between exposure to environmental factors and reproductive toxicity must be elucidated. The Ministry of the Environment and the National Board of Health in cooperation with the Ministry of Food, Agriculture and Fisheries and the Ministry of Employment will

examine whether parallel processing of existing registers containing information on incidences of reproductive toxicity and special occurrences of certain environmental factors can suggest possible relationships. Funds have been allocated for this purpose in the Danish Finance Act 2002-2004. See section 5.2 on registration and monitoring.



3.5 Endocrine-disrupting effects

The increases in the incidence of endocrine-related cancer in women and men, and declining sperm quality in men are suspected of being linked to exposure to chemicals with endocrine-disrupting properties. If this suspicion is true, and the trend continues, this may have serious consequences for the future. Denmark is contributing to international work to first of all ensure that endocrine-disrupting substances are identified, so that they can be replaced with less problematic substances in the long term.

Objectives and initiatives in the near future

The overall objective is to limit the exposure to chemical substances that affect the endocrine system in humans and animals.

There must be research into effect mechanisms, cause-and-effect relationships, and test methods for identification of endocrine-disrupting effects. Fulfilment of the task requires coordinated and systematic efforts by the Ministry of the Environment, the Ministry of the Interior and Health, the Ministry of Food, Agriculture and Fisheries and the Ministry of Employment.

Possible consequences of endocrine-disrupting effects are so serious that we must first of all be able to identify the endocrine-disrupting substances and take necessary measures to have them replaced by less problematic substances. Emphasis must be given to those substances that entail a risk of humans being directly exposed to high doses, e.g. via food, consumer products, the indoor climate and the working environment. Emphasis must also be given to those substances entailing a special risk of foetal and post-natal exposure.

Denmark supports the short-term, medium-term and long-term initiatives in the EU Strategy and is contributing new knowledge on endocrine disrupters to the dynamic EU list of potential endocrine disrupters.

In the Danish strategy initiatives against endocrine disruptors aim at three areas, namely at studies followed up by action-orientated investigations, including initiatives for the aquatic environment; at further knowledge building and development; and at regulation.

In the Danish Finance Act 2002-2004, DKK 3 million have been allocated annually to enhancement of the scientific basis for solving the problem of endocrine disruptors.

The Ministry of the Environment is still supporting the OECD test method development programme for endocrine disruptors, which will develop standardised methods of determining the endocrine-disrupting effects of chemical substances on the environment and human health.

Initiatives regarding endocrine disruptors should be seen in context with international initiatives towards chemicals in general, see section 2.1. The government will work to see endocrine disruptors covered by the authorisation procedure (the REACH system) in the coming EU rules banning substances with particularly harmful effects, unless authorisation for specific use is granted. This will be possible as soon as suitable test methods and criteria for endocrine-disrupting effects have been developed.

In relation to the report on endocrine disruptors from September 2002 by the Environmental and Regional Planning Committee of the Danish Parliament, a national ban will be considered for substances listed in the EU list of the 66 substances with documented endocrine-disrupting effects, which already are subject to EU risk assessment, if the risk assessment has not been completed by 2004. The ban will be considered on the basis of a review of patterns of use, degree of harmfulness, and exposure conditions.

The Ministry of the Environment will also initiate a survey to elucidate patterns of use and exposure conditions for two substances, listed in the EU list of the 66 substances with documented endocrine-disrupting effects, but not currently subject to EU risk assessment.

In addition, the Ministry of the Environment will expand its list of undesirable substances to include substances, not already banned, but listed in the EU list of substances with documented endocrine-disrupting effects. At the same time, the Ministry of the Environment will examine whether pesticides present in the EU list, and either banned or not authorised for use in Denmark, are being used for other purposes.

As part of the monitoring of possible links between the declining sperm quality in men and exposure to endocrine disruptors, the Ministry of the Environment and the Ministry of the Interior and Health are supporting a monitoring programme for sperm-quality trends. The Ministry of the Interior and Health will enhance efforts to examine the causes of deteriorating sperm quality and other adverse effects.

In the years to come, research and development will make up part of the basis for the preventive initiatives towards endocrine disruptors. For more on important areas, please see section 5.3 on research.



3.6 Injuries to the nervous system

Effects on the nervous system often cause very complex health problems. We know more today about the consequences of developmental effects in the nervous system in children and age-related deterioration of the nervous system in the elderly. A number of environmental factors can influence the development and function of the nervous system. The harmful effects of certain organic solvents are well-known, and due to targeted initiatives against these, the protection level has increased significantly over recent decades. In other areas knowledge is more limited, but it seems e.g. that endocrine-disrupting substances can cause injuries to the nervous system. In continuation of existing initiatives, the objective is to document, identify, examine, and limit environmental factors that can contribute to increasing the risk of injuries to the nervous system, especially during brain development.

Objectives and initiatives in the near future

The objective is to prevent environmental factors from causing injuries to the nervous system.

Initiatives regarding substances harmful to the nervous system should be seen in context with initiatives towards chemicals in general, see section 2.1. Substances harmful to the nervous system must be identified and exposure to these substances must be limited. Denmark will work within the EU to have neurotoxic substances identified and classified.

There is a need for more precise knowledge about the effects on the nervous system and how these are related to environmental factors, especially in regard to endocrine disrupters. Initiatives will therefore primarily be targeted at endocrine-disrupting substances, see section 3.5.

Better opportunities for studying effects causing injury to the nervous system are required. In cooperation with the Ministry of Food, Agriculture and Fisheries, the Ministry of the Environment will therefore seek to enhance the development of new test methods, especially in relation to identification of endocrine-disrupting effects. For more, see section 3.5.

Substances in the working environment that are most prone to causing injuries to the nervous system must be identified and, if possible, replaced.

Limit values for contents in food of a number of neurotoxic substances, e.g. PCBs, must be established. The point of departure is that limit values are to be established in such a way that even the most sensitive and vulnerable groups of people are protected against adverse health effects.

In the years to come, research and development will make up part of the basis for the preventive initiatives against substances harmful to the nervous system. Important areas are primarily:

- to identify the relationship between exposure to environmental factors and injuries to the nervous system.
- to develop new OECD test methods to identify neurotoxic substances
- to elucidate public exposure to neurotoxic substances, especially the exposure of children and pregnant women.

Other areas fall under endocrine disruptors, see also section 5.3 on research needs.



3.7 Infectious diseases

Many people suffer from infectious diseases each year. Infection among humans is linked with e.g. hygiene and proximity to others. This is the case with e.g. incidences of infectious diseases among children in day-care institutions. Only a small part of infectious diseases in Denmark are caused by micro-organisms in water and food. The objective is to ensure a high level of protection and thereby reduce the incidence of infectious diseases. The target for 2020 is to reduce pathogenic organisms in water to a level that does not cause negative health effects.

Objectives and initiatives in the near future

The overall objective is to keep ensuring a high level of protection. Objectives in the individual areas are to reduce pathogenic micro-organisms to a level that does not cause negative health effects.

The Ministry of the Environment will establish quality requirements or limit values and develop methods of analysis for micro-organisms that may comprise a health hazard in drinking water, bathing water, wastewater, and sludge. An amount of DKK 2 million has been allocated in the Danish Finance Act 2002-2004 to combat microbiological pollution. To begin with, emphasis will be on *Giardia* and *Cryptosporidium* parasites.

We must prevent the occurrence of the bacteria *Legionella* in water installations. In cooperation with the Danish Energy Authority, the National Board of Health (NBH), Statens Serum

Institut, and the National Agency for Enterprise and Housing, the Ministry of the Environment has issued a brochure to house owners and caretakers about the problem. The National Agency for Enterprise and Housing regularly revises the building regulations as required, and when new knowledge on how to best safeguard against Legionella in water installations is at hand.

The relationship between intake of, or contact with, polluted water and incidences of diseases must be elucidated. In cooperation with the National Board of Health and the Danish Veterinary and Food Administration, the Ministry of the Environment will examine whether parallel processing of registered data may indicate possible relationships. For more, see section 5.2 on registration and monitoring.

The Ministry of Employment and the National Working Environment Authority strongly recommend that groups of personal that have been recommended vaccination against Hepatitis B, follow the recommendation.

In the years to come, research and development will make up part of the basis for the preventive initiatives towards micro-organisms. Important areas include:

- knowledge on pathogenic micro-organisms in nature,
- knowledge on contributory factors to the development of resistance to antibiotics,
- knowledge about the impact of micro-organisms on human health at low concentration levels, e.g. in drinking water, and
- knowledge on occurrences of viruses in the environment and their significance for public health.



3.8 Hearing damage and noise-related health effects

Noise is a nuisance problem for many people. The working environment is the most important source of noise-related hearing damage but some chemicals can also damage hearing. Noise can contribute to increased stress and the risk of heart and circulatory disorders. The objective is to provide protection for everyone against exposure to environmental factors that can cause hearing damage. In addition, exposure to noise nuisance that can be otherwise harmful to health and deteriorate the quality of life must be limited.

Objectives and initiatives in the near future

Objectives and initiatives to limit damage arising from noise are also described in section 4.2 on the working environment and section 4.8 on noise.



3.9 Other effects

Environmental factors can contribute to the occurrence of other negative health effects and nuisances. Lifestyle factors are clearly the main cause of the high incidence of cardiovascular diseases, however, environmental factors can play a contributory part. Stress-related disorders, odour nuisances and less documented effects, can be due to impacts from environmental factors. There is evidence of new disorders caused by e.g. exposure to chemicals in very low doses and to smells and odours, not normally deemed problematic. Negative health effects stemming from several different simultaneous sources (combination effects) have not been uncovered. It is therefore important to gain more knowledge about possible relationships. This knowledge is a prerequisite for targeted initiatives against unspecific symptoms.

Objectives and initiatives in the near future

Initiatives against other effects should be seen in context with initiatives towards chemicals in general, see section 2.1 on asthma and section 3.2.

The problem of combination effects must be elucidated. The Ministry of Food, Agriculture and Fisheries and the Ministry of the Environment are jointly in the process of carrying out initial work on combination effects.

Unspecific chemicals-related health effects must be examined. In cooperation with Ministry of the Interior and Health, the Ministry of the Environment will assess whether initiatives are needed in this area. The assessment will be on the basis of the recently published report on Multiple Chemical Sensitivity syndrome (MCS).

In the years to come, research and development will make up part of the basis for the preventive initiatives against unspecific chemicals-related health effects. Important areas are:

- knowledge on combination effects from the presence of several chemicals simultaneously and the interplay with individual sensitivity, and
- internationally accepted methods for establishing limit values in regulations to protect people from odours and tastes.

Sources of environmental health effects

4



Food, the working environment, indoor climate, air, water, soil, consumer products, noise, and radiation are the most important sources causing human exposure to environmental factors.



4.1 Food

Consumers want healthy and safe food. Food can be polluted by chemicals, residues of pesticides, and other environmental factors. These risk factors must be prevented and limited at source. Substances allowed in food production, such as pesticides, food additives and veterinary medicines, must be assessed and approved before they are used. Food manufacturers are generally responsible for the safety and quality of food. The authorities ensure that there is good information about the safety of food, and they supervise producers' compliance with existing limit values.

Objectives and initiatives in the near future

The objective is an unconditional high level of protection in the food area.

The Danish Veterinary and Food Administration will regularly adapt existing limit values and set further limit values for both residues of chemical substances and environmental pollutants. The limit values will be set on the basis of health assessments, and acknowledging the precautionary principle. The concepts of good agricultural practice (GAP) and good manufacturing practice (GMP) will also be applied. This is realised in the principle that a limit value is set as low as possible (the ALARA principle: as low as reasonably achievable). ALARA, GAP, and GMP are also applied at international level.

There is a high level of protection for veterinary medicines and food additives that are permitted in food production and that appear on positive lists in the EU. Legislation is regularly monitored and revised, and new knowledge leads to revised conditions for the use of substances in practice. These substances are permitted when a technological need has been documented and when there are no health risks. An assessment of whether there is a risk that consumers may be misled is also carried out for food additives.

Extra initiatives will be taken with regard to releases of chemicals from packaging and for aromatics in order to ensure that the conditions for use are set as restrictively as necessary when preparing the positive lists in the EU. There are a great many substances to be assessed, and the initiatives will be demanding on resources.

The basis for approving pesticides is that they can only be permitted and applied if the high level of protection can be ensured. In March 2003, the European Commission presented a proposal for revising the rules on setting limit values for pesticide residues. The proposal states that a fixed maximum limit of 0.01* mg/kg should be set as a basis for all substances that have not been assessed. The limit of 0.01* mg/kg is the lowest analytical detection limit, but in certain circumstances it can be set lower for health reasons. The Danish government will work to raise the priority for setting *the common EU limit values for pesticide residues in food*, as there is still no common limit value for several hundred substances.

There may be a need to examine the problem more closely for chemical substances, where there is a suspicion of a health risk, and where there is a lack of knowledge about which food the chemicals are found in, and their quantity and source.

In the EU, the existing *Regulation on Contamination in Food* is being expanded and data on pollutants such as PAHs is being collected for EU scientific work. In autumn 2001 the European Commission's proposal on setting limit values for dioxin and PCBs in food and animal feed was adopted. The proposed limit values entered into force on 1 July 2002. The Ministry of Food, Agriculture and Fisheries and the Ministry of the Environment have prepared a joint action plan to ensure the best possible follow up when the limit values are exceeded. This means, for example that if the Danish Veterinary and Food Administration finds excess dioxin in milk, the Danish Environmental Protection Agency or the Danish Plant Directorate must find the source, and as far as possible ensure that the limit value is not exceeded again.

In 2000 and 2001, the Ministry of Food, Agriculture and Fisheries and the Ministry of the Environment presented *Action Plan for Dioxin and Dioxin-like PCBs*. The action plan with information on the occurrence of dioxin in the environment, animal feed, and food is to be taken further as an important supplement to EU regulation. As part of the Action Plan, the Ministry of Food, Agriculture and Fisheries has initiated a comprehensive project to chart the occurrence of dioxin and dioxin-like PCBs in fish caught in Danish waters. This exercise will ensure that any future decisions can be made with a well-documented basis.



4.2 Working environment

Many health problems related to the working environment arise from exposure to chemical substances and physical environmental factors such as noise. Also of significance is the indoor climate and exposure to micro-biological factors, as well as radiation in varying degrees. The objective is that Danish workplaces should be a healthy and safe framework for employees, see the action programme "Clean Working Environment 2005".

4.2.1 Chemicals

The vision is that, by 2020, no employee should be exposed to harmful effects caused by heavy metals, carcinogens, organic solvents, or other hazardous chemicals in the workplace.

Objectives and initiatives in the near future

As follow up to the visions of no work-related exposures to carcinogenic chemical substances, organic solvents and heavy metals, the National Working Environment Authority will emphasise the following elements in regulations, guidelines, supervision, and inspection, in cooperation with the social partners:

- The use of chemicals at workplaces must be minimised as far as possible.
- Work-related exposure to carcinogenic, neurotoxic, and allergenic substances must be avoided by using the least dangerous substances or materials (the substitution principle).
- Enterprises must receive clear directions for use from manufacturers.
- Working environment conditions and prevention of industrial injuries must be included in the planning phase.
- Suppliers must be motivated to develop products that take health and safety into account.
- The social partners must support initiatives to phase out problematic substances.

In order to ensure a good knowledge base for working environment initiatives against hazardous chemical substances, there is a need for information about the toxicity and dangers of chemical substances, so that the most important substances causing the development of occupational disorders can be identified. Tools such as registers and methods must be developed and applied to identify and monitor the spread, scope, and risk of both exposures and diseases in Danish businesses.

4.2.2 Noise

Noise from machines, tools, and processes is a serious problem at Danish workplaces. The Action Programme for a Clean Working Environment 2005 has an objective to reduce or eliminate entirely hearing damage as a result of noise at work.

Objectives and initiatives in the near future

Further to the vision of no hearing damage from noise at work, in the period 2002-2006, noise causing hearing damage will receive top priority, not forgetting nuisance noise.

The goal for *noise harmful to hearing* is to reduce the number of cases exceeding the limit value to a minimum, and to reduce unnecessary noise as much as possible. The National Working Environment Authority is initiating the process to reduce noise by issuing improvement notices for noise harmful to hearing. The process should be backed up by the Occupational Health Service and the social partners with information and suggested solutions.

The machines, processes, and work situations where it is currently not possible to reduce noise adequately will be identified. Pressure will be put on individual enterprises, suppliers will be involved, and opportunities to enhance research efforts in the area should be found.

Developments in the noise field will be followed in the monitoring project, and through a research project about noise exposure in risk sectors.

With regard to *nuisance noise*, the National Working Environment Authority will seek knowledge about such noise and how it affects health, including nuisance noise in offices.

In 2002, the National Working Environment Authority ran a special initiative for day-care institutions, and noise was one of the topics.



4.3 Indoor climate

Indoor climate is very significant for our quality of life because we spend most of our lives indoors at home and at work. The indoor climate can be influenced from a number of sources, by many different environmental factors, and many people will experience nuisance and symptoms resulting from a poor indoor climate. Dust mites in the indoor climate can cause development of allergies and respiratory disorders, and other

environmental factors can exacerbate these. Radon in the indoor climate is a contributory cause of lung cancer. Future extended initiatives to create a better and healthier indoor climate call for expansion of the current cooperation between the authorities. At the same time, the knowledge currently available must be operationalised to a greater extent through communication and guidelines, as a greater degree of compliance with advice and guidelines will lead to significant improvements in the indoor climate. At workplaces there is a need for supervision in order to maintain a good indoor climate.

Objectives and initiatives in the near future

The overall objective for this area is to ensure a good indoor climate, and to ensure that the risk of nuisance, disease, and symptoms resulting from environmental factors is abated as far as possible.

The coordinating working group (see section 6) will ensure a more cohesive effort by the authorities to protect the indoor climate. The working group should ensure greater cooperation in work by the authorities to prepare guidelines and initiatives to protect the indoor climate, for example through quality requirements and limit values.

The existing knowledge in the area must benefit the population to a greater extent through improved communication and consultancy. The Ministry of Employment, the Ministry of the Environment, and the National Agency for Enterprise and Housing will start initiatives to improve the indoor climate. These will include intensifying consultancy and advisory efforts and ensuring that the rules are complied with at workplaces.

The Danish Ministry of Economic and Business Affairs will issue two instructions to professional building inspectors for use in inspection, assessment, restoration, and renovation of buildings with mould-fungus problems. In addition, the building sector is working with the "Dry Building" initiative, which will help reduce the risk of rising damp, and thus the formation of mould, early in the construction phase.

The Ministry of Employment will continue its work to improve the working environment with respect to microbiological impacts. Amongst other things, the significance of mould fungus for the development of indoor climate symptoms will be researched further, and the rules regarding securing the building against mould fungus will be tightened.

The National Agency for Enterprise and Housing will support extension of the voluntary labelling scheme, "Dansk Indeklima Mærkning" ("Danish indoor climate labelling"), for relevant products. Labelling will also take account of more health effects than previously. For example, allergies and cancer could be included. At the moment, work is taking place to expand the scheme with new product standards for furniture, filler, concrete elements, brickwork, and ventilation and air conditioning systems.

The National Agency for Enterprise and Housing and the National Board of Health will continue to focus on preventive measures against the radon problem in the indoor climate. The National Institute of Public Health will enhance initiatives for better registration of indoor-climate nuisance, in order to build knowledge in connection with indoor-climate-related health problems. One measure for this will be completion of a questionnaire survey.

The National Working Environment Authority will promote mapping buildings in connection with workplace assessments, and this includes plans for renovation and maintenance.

Research and development in a number of areas will be part of the basis for further initiatives for the indoor climate. In particular, areas include:

- knowledge about the scope and significance of different impacts from pollution sources and about psychosocial conditions in relation to public health and well-being indoors.
- knowledge about correct consultancy, including through completing "before-and-after" surveys in order to assess the effect of specific initiatives to improve the indoor climate.
- knowledge to prepare relevant standards/quality requirements for specific risk factors in the indoor climate. * further knowledge about how planning, projecting, construction, operation, and maintenance of buildings can take optimal account of reducing indoor-climate impacts.



4.4 Air

A large amount of human activity creates air pollution. Traffic, energy generation, industry, and waste incineration are the dominant sources of air pollution in Denmark. Air pollution includes a number of components harmful to health such as particles, nitrogen oxides, sulphur dioxide, heavy metals, ozone, and other chemical compounds. The present levels of particles, both fine and ultra-fine particles, are regarded as a serious health problem. A lot of work is taking place nationally and internationally, including in the EU, to monitor and improve air quality.

Objectives and initiatives in the near future

The overall objective is high quality of air, where emissions of harmful substances into the air and impacts harmful to public health are reduced as far as possible.

Denmark will continue international activities to combat air pollution. Concerted regional and global efforts are vital because air pollution is transboundary. The overall objective is to achieve air quality with no negative effects on the population. Air pollution must be reduced, and therefore Denmark will work for effective policies both in the EU and globally. This work will concentrate on transport and energy.

As a result of an EU directive on national emission ceilings for 2010, Denmark must reduce emissions of SO₂, NO_x, VOCs, and ammonia. The Danish government has a further objective to limit emissions of nitrogen oxides (NO_x) and volatile organic compounds (VOCs) from transport by 60%, compared to levels in 1988. Meeting national emissions ceilings at EU level will reduce the formation of ozone and thus the content of ozone in the air. In the same period, the government will halve the emissions of particles by traffic in towns and cities.

The joint working group from the Ministry of the Environment and National Board of Health on outdoor air pollution will continue to assess regularly the health aspects connected to air pollution in Denmark.

The relationship between particulate pollution and harmful health effects is well documented. However, there is a need to know more about how individual sources of pollution contribute to human exposure to fine and ultra-fine particles, and how they affect health - especially in a Danish context. It is important to gain more knowledge about these relationships in order to identify particularly pollutant sources, other than diesel-driven vehicles, and in order to be able to give more precise assessments of the health benefits of specific measures against the individual sources of pollution.

The Ministry of the Environment will take initiatives to improve the basis for preventing air pollution, particularly from fine and ultra-fine particles. The Danish Finance Act 2002-2004 allocates DKK 3 million to this matter. Furthermore, the sub-programme "Environment and Transport" (1999-2003) under the Strategic Environmental Research Programme has initiated research projects to illustrate a number of relationships between air pollution and public health.

The Ministry of the Environment has a nationwide air-monitoring programme with systematic measurements of the air content of coarse and fine particles (PM₁₀ and PM_{2.5}) in Denmark. Measuring these particles is currently the best available indicator of the health damage resulting from particle pollution.

In June 2003, the government published a report on air pollution from particles. The report confirms that emissions of diesel particles are a special problem in densely built-up areas subject to heavy traffic. On the basis of foreign surveys and Danish estimates of particle emissions, it is estimated that by installing particle filters on all heavy vehicles in Denmark, urban levels of ultra-fine particles could be reduced by 20 per cent, and about 450 deaths could be avoided each year. It is clear that, for various reasons, it is not possible to install particle filters on all heavy vehicles, and therefore the health benefits would be smaller. The report indicates a special area for initiatives to continue tightening the requirements on particle emissions from diesel vehicles through standards work in the EU. Furthermore, the report describes trials with environment zones with, for example, restricted access for vehicles unless they have a particle filter installed.

We need greater knowledge about the sources of dioxin and the amount emitted from the different sources. The Ministry of the Environment is carrying out an extensive measuring programme to measure the amount of dioxin emitted from different sources, and the deposition of dioxin on land and in water. In addition, the Ministry of the Environment is cooperating with the Ministry of Food, Agriculture and Fisheries to examine the relationship between emissions of dioxins and their occurrence in food. In connection with this, there is regular follow-up to the Dioxin Action Plan.



4.5 Water

4.5.1 Groundwater and drinking water

Protection of the groundwater is top priority, as about 99 per cent of drinking water in Denmark is virtually almost untreated groundwater. Danish drinking water is generally of high quality. However, in certain places there are problems with high concentrations of pesticides and a number of substances harmful to health in groundwater.

Objectives and initiatives in the near future

The overall objective is that there should continue to be adequate clean groundwater in the future so that there is no need to treat the water for pollutants before it becomes part of the drinking water supply. The current high level of protection from micro-biological pollution in drinking water is considered satisfactory and will therefore be continued.

In order to achieve this objective, regulation of pesticides and their application will also be accorded high priority in the future. In 2003 a new goal will be set to reduce the frequency crops are treated. The long-term goal is to develop cultivation strategies that reduce the agricultural sector's dependency on pesticides, enabling their use can be minimised as far as possible. The use of pesticides by Danish agriculture must be reduced, at the same time ensuring profitable cultivation. In the long term, the use of pesticides must be reduced as far as possible. There must also be international focus on the over consumption of pesticides. Pesticides must be assessed restrictively both in Denmark and internationally.

BAM is a decomposition product from two pesticide products and is a problem inherited from the past. Today this is the single substance posing the greatest threat to water supplies. Surveys show that the substance is present in every fourth waterworks drilling and in every third small private water-supply installation. The Ministry of the Environment has allocated DKK 10 million over the next four years for studies of BAM and for studies of the water quality in private wells and drillings.

At the same time, counties will continue remediating waste deposits and landfills, and make the process more efficient via the programme for technological development of soil and groundwater contamination. The problems of nitrate in drinking water must also continue to be followed closely, in order to ensure that the groundwater content does not exceed levels that can be harmful to health.

One of the central elements in protecting the groundwater is designation by counties of areas with special drinking water interest that cover the most important sources of groundwater. There must be a detailed mapping and survey of the areas especially vulnerable to certain pollutants such as nitrate. The areas identified must be subject to closer examination covering detailed mapping of land use, pollution threats, and natural protection of groundwater resources. On the basis of this, the county will prepare an action plan describing the need for any changes in land use. Using the action plan as a foundation, counties, local authorities, and waterworks will be able to enter into agreements with landowners on regulating agricultural activities, purchasing property, etc. for the parts of the waterworks' capture upland with needs for changes in land use.

In cooperation with the Ministry of Food, Agriculture and Fisheries, the Ministry of the Environment has initiated research and development work to assess whether areas especially sensitive to pesticide pollution can be indicated. Please see section 4 on soil contamination.

At the moment, components used in installations must be approved in accordance with requirements laid down by the National Agency for Enterprise and Housing. The current national scheme will be replaced by a European scheme. In light of this, the National Agency for Enterprise and Housing will work with the Ministry of the Environment to examine the possibilities of reassessing the approval scheme in order to ensure that metal from the installation does not cause a deterioration in the quality of drinking water.

Moreover, before a risk assessment of the environmental impacts is possible, there is a need for more knowledge about the effects and fate of veterinary and human medicines, including whether they can leach into the groundwater. This will be a task for the Research Councils.

4.5.2 Sea and lakes

Beaches and lakes designated as bathing areas must have good, hygienic quality. High-quality bathing water requires a low content of infectious matter. Discharges into the aquatic environment of substances harmful to health must be limited. Wastewater treatment in the open country must be improved. This will also further improve the quality of bathing water. Development of better and new methods to manage wastewater will continue.

Objectives and initiatives in the near future

The overall objective is to ensure the least possible impacts from wastewater on the sea and lakes.

Initiatives to improve wastewater treatment in properties in the open country not connected to the sewerage system will contribute to a general improvement in the quality of water in water courses and lakes, and thus an improvement in the quality of bathing water.

At places where problems in bathing water quality have been ascertained, the Ministry of the Environment has stressed to the counties involved that they must work to meet the goals laid down in the regional plan. This work will continue until there are no more bathing sites with poor quality water due to wastewater impacts.

The occurrence of endocrine disrupters and their fate in wastewater, the aquatic environment and treatment plants, as well as their effects on fish must be investigated. On the basis of the study of existing knowledge, the necessary initiatives to solve the problem of sexual disturbances in fish in Danish watercourses will be identified.

International agreements have been entered on the reduction of discharges of substances dangerous for the environment. In connection with permits to discharge substances dangerous for the environment, in general such substances must be assessed for their toxicity, biodegradability, bioaccumulation, content of carcinogenic substances, etc.

The EU Water Framework Directive, adopted in 2000, sets requirements after 2006 for further initiatives against substances dangerous for the environment, both at common European level, and in Member States.

4.5.3 Swimming pools

There is a high level of protection of water quality in public swimming pools. Harmful micro-organisms are removed so that they do not pose a health risk. Too many people using the pool at one time, and inadequate washing before they swim, can mean that substances harmful to health are spread in swimming pools. Regular supervision and inspection of swimming pools and swimmers' hygiene are important, and tighter requirements must be considered.

Objectives and initiatives in the near future

The overall objective is that the quality of water in swimming pools must be good enough to avoid harm to health through normal use of the pool.

The Ministry of the Environment is investigating whether the existing quality requirements adequately safeguard risk groups. The Ministry of the Environment will also carry out a risk assessment of the micro-organisms that are not covered by quality requirements.

Furthermore it is important to ensure understanding amongst personnel and pool guests that complying with the hygiene instructions means that addition of chemicals to clean the water can be reduced as much as possible.



4.6 Soil

Contaminated soil must not threaten drinking water or human health. The soil is contaminated in large areas of towns and cities by chemicals that are typically the results of past commercial activities or deposition from the air. Heavily contaminated soil can affect health, if people come into direct contact with the soil, or if the pollutant substances evaporate and are inhaled or absorbed by plants or animals used as food. Contaminated areas must be mapped and remediated, and people must be safeguarded from coming into contact with contaminated soil. Diffuse effects on agricultural areas as a result of agricultural activities should continue to be monitored and assessed in an environmental and health context.

Objectives and initiatives in the near future

The overall objective is to ensure that soil contamination in residential areas, and pollution that can endanger the current and future water supply, do not give rise to health problems.

Therefore, it is important to maintain efforts against past and future soil contamination, including non-point-source pollution in connection with field use, that should be monitored and assessed in an environmental and health context.

The Ministry of the Environment will promote methods for remediation and to limit exposures, partly to protect the groundwater, and also so that efforts against soil contamination can be completed as efficiently as possible. The Ministry of the Environment will constantly monitor possible new contamination sources, and it will assess special regulatory requirements for these in order to prevent soil contamination in the future. The principles for the initiatives to be implemented in order to improve knowledge about remediation, surveys, and risk assessments of soil contamination are described in the annual Programme for Development of Technology - Soil and Groundwater Contamination under the Ministry of the Environment.

Because of the enormous amount of work involved in mapping and remediating contaminated sites, efforts will take place over a longer period, and counties and municipalities will concentrate at first on areas with the greatest exposure risks, for example dwellings and childcare institutions, and where drinking water supplies can be under threat either now or in the future. The Soil Contamination Act is based on the polluter pays principle, but in connection with pollution that has already happened, there are legal problems in making the polluter liable for pollution and therefore remediation.

In the years to come, research and development will make up part of the basis for the preventive initiatives against soil contamination. Important areas are knowledge about assessing risks and level of protection for soil contamination, including:

- knowledge about the bio-accessibility of soil contamination
- knowledge about evaporation of soil contamination and its effects on the indoor climate
- knowledge about leaching into the groundwater, also in connection with non-point source impacts on agricultural soil and crops
- development of cost-effective methods to map soil contamination.



4.7 Consumer products

As consumers, we are exposed to chemical substances everywhere through the chemical products we use every day. Allergies are the health effects most often connected with using consumer products. Other than allergies, we have no immediate knowledge of the severe health problems caused through normal use of individual consumer products. Consumer products can, however, also be the cause of cases of poisoning due to incorrect or unforeseen use. The diffuse spread of chemicals in many products, and the use of many different consumer products is a cause for concern for adverse health effects in the long term. The goal is to increase knowledge about which problem substances are present in consumer products and whether exposure to these substances increases health risks. The goal also includes having all consumer products subject to chemical regulations.

Objectives and initiatives in the near future

Consumers must be protected, and they must be able to protect themselves against chemicals in all types of products. International activities regarding chemicals in consumer products are necessary because chemicals spread across national borders, primarily through trade, but also through the environment.

Initiatives for consumer products should be seen in the context of initiatives towards chemicals in general, see section 2.1. In the EU, Denmark will work to see all applications of chemicals in consumer products covered by the chemicals regulation.

The health of children must be afforded greater priority than it is today. Within the EU, Denmark will work to develop an entirely new Directive on toys to strengthen regulation of the

content of dangerous substances in toys. Furthermore, Denmark will work to see chemicals in toys covered by the new EU common chemicals regulations.

Within the EU, Denmark will also work to ensure that in the longer term positive lists are prepared, for example for hair dyes. Denmark will also work to include cosmetic products in the new EU common chemicals regulations.

During the Danish Presidency of the EU, an agreement was made introducing great improvements in the regulation of chemical substances on a number of crucial points. Firstly, every single allergenic odorant in cosmetics, including perfumes, is subject to a duty to declare, so that consumers are able to choose against buying products containing allergenic perfumes. Secondly, there has been agreement on, in principle, banning CMR substances in cosmetics. A third important element in the agreement is the introduction of a ban on experiments on animals when testing cosmetics, although the ban will first enter into force in 2009 so that alternative test methods can be developed.

The Ministry of the Environment is working in both the European and the Danish Eco-labelling Boards to exclude or reduce substances harmful to health in products permitted to carry the EU "Flower" and the Nordic "Swan" eco labels. Through criteria on issuing these labels, a large number of substances dangerous for the environment have already been excluded, and the Ministry of the Environment is working to have a large number of substances harmful to health excluded.

In Denmark, the Ministry of the Environment will continue the debate on unnecessary chemicals and what the individual consumer can do to minimise the negative impacts from chemicals.

We must find out whether there are greater health risks from using consumer products. Therefore, the Danish Finance Act 2002-2004 allocates resources to raise the level of initiatives in this area. The Ministry of the Environment is initiating investigations to increase knowledge about which problem substances are contained in consumer products, how and where many of these substances are released, and whether using these substances increases health risks.

A National Allergy Research Center for Consumer Products has been established by the Ministry of the Environment. The Ministry of the Interior and Health is taking part in the steering group. The Center will deal with allergies caused by chemical substances in consumer products. The Center is part of the health service and it will establish a solid and scientifically founded basis for initiatives to prevent allergies caused by chemical substances in consumer products.

In the years to come, research and development will make up part of the basis for the preventive initiatives relating to consumer products. Important areas will be:

- which problematic chemicals are present in consumer products,
- how and how much of these substances are released, and
- whether this leads to greater health risks.



4.8 Noise

Noise affects many people. We meet noise in many contexts. At home, at work, when travelling, and in leisure time. The goal is to remove or quieten a number of sources of harmful and nuisance noise. Where this is not possible, the goal is to protect people against harmful noise.

Objectives and initiatives in the near future

The overall objective is to remove or quieten sources of noise that emit noise above the limit values. Where this is not immediately possible, the goal is to implement initiatives that reduce the risk of people being exposed to harmful or nuisance noise.

In the future, the Ministry of Employment will target initiatives, especially against noise at workplaces and in production processes where noise more than the indicative limit value is still a problem. At the same time, the Ministry of Employment will increase initiatives to alleviate the growing problem of nuisance noise at less than the limit value. Initiatives against noise at the workplace are described in section 4.2.2.

Further to adopting the EU Directive on Assessment and Management of Environmental Noise, noise from larger roads, railways, airports, and large towns in Denmark will be mapped. The mapping will help target and set priorities for preventive measures in the area. As part of the new Directive, action plans will be prepared for the most exposed areas.

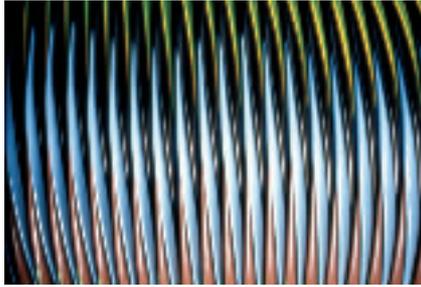
The Strategy on Road Noise will include elucidation of possibilities to reduce the number of dwellings severely affected by road noise. A severely affected dwelling is exposed to noise of more than 65 dB. Another important part of the Road Noise Strategy will be to implement a macro-economic assessment of the health consequences of road noise, and the measures that can be applied to reduce the number of severely affected dwellings.

Further to the EU Directive on Noise Emission from Outdoor Equipment (directive 2000/14/EC), the European Commission will investigate whether common European limits for noise emitted from railway equipment can be established.

The National Agency for Enterprise and Housing will reassess the noise-related requirements for new buildings with a view to reducing noise from neighbours in multi-floor dwellings and improving the acoustic conditions in childcare institutions and schools.

Research and development into the consequences of exposure to nuisance noise is inadequate. For example, there is a lack of knowledge on:

- Stress-related, communications-related, and sleep-related consequences. There is a need to build knowledge to a level where it is possible to quantify the health effects, and the economic effects.
- The mechanisms behind the effects noise has on, for example blood pressure, and the types of noise that cause a reaction. This will provide a better understanding of the significance of noise impacts, for example in the working environment.



4.9 Radiation

Radiation increases the risk of damage to genes in cells. Most of the radiation to which we are exposed from day to day is from naturally occurring sources. Radioactive radon in housing is a problem where preventive measures could reduce the health risk.

Objectives and initiatives in the near future

The overall objective is to reduce the harmful effects of radiation on people through influencing people's lifestyle. In particular this includes airing dwellings and sunbathing. The objective is also to retain the generally high level of protection from the use of ionised radiation, and radiation from products.

The National Agency for Enterprise and Housing and the National Board of Health will continue to focus on preventive measures against the radon problem in both new and existing housing.

The National Board of Health and the Danish Environmental Protection Agency will continue to issue guidelines on the best protection against UV radiation.

Cross-disciplinary initiatives

5



This section deals with central issues that are relevant if we are to gain an understanding of the work the authorities are carrying out to protect the population from harmful environmental factors. The following provides an overview of the tools and methods used by the authorities to achieve a high *level of protection* against negative effects from environmental factors; of how the authorities make use of *registration and monitoring*; of the *research* and research fields considered important; and of how the authorities use *information and risk communication* in the dissemination of knowledge and available intervention opportunities to the public. Moreover, future objectives and initiatives in the areas are pointed out.

The issues are varied and they are dealt with across different authority spheres. Thus descriptions of the different areas are different from previous sections.



5.1 Level of protection

The limitation of public exposure to harmful environmental factors is managed by different authorities, depending on whether limitation is targeted at environmental factors present in *the environment, in the working environment, in the indoor climate, or in food and consumer products*. The objective is to achieve more cooperation and a mutual understanding of the need to protect public health, and to achieve greater mutual benefit from each other's work.

Objectives and initiatives in the near future

More cooperation and coordination across the different ministries within the areas *risk assessment, risk management, and risk communication* must be ensured, e.g. with regard to the protection of especially sensitive and vulnerable groups of people. Areas where more cooperation and coordination can help promote more uniform protection of the public include:

- Risk assessment and establishment of principles of risk assessment of micro-organisms.
- Risk assessment and establishment of limit values for substances in relation to the working environment, the external environment, and intake via food. This includes taking contributory sources into account in the establishment of limit values.
- The establishment of a common exposure model for food, the environment, the indoor climate, and the working environment, including development and use of models. Use of models for chemical structure-activity relationships in connection with risk assessments.

- Assessment of general problems, e.g. the protection of especially vulnerable and sensitive groups of people, exposure of children and pregnant women, combination effects in relation to exposure to several substances at the same time etc.
- Coordination of work on regulation of chemical substances and materials across different sectors, e.g. regulation of packaging in contact with food, water, medicines, and regulation of packaging waste.
- Coordination of risk assessment and management in areas where protection of the environment and public health is an inter-ministerial task, e.g. in connection with problems regarding use and landfilling of sludge, contaminated soil and, dredged material from harbours.
- Risk communication as an integrate part of communication to the public and among authorities.
- Selection and use of indicators for assessment/measuring of regulatory effects on environmental factors and their impact on the environment and health.
- Coordination and initiatives by the authorities in relation to the indoor climate. These are described in section 4.3.



5.2 Registration and monitoring

In Denmark, there is already extensive monitoring and registration of a number of environmental factors and the incidence of various diseases and causes of death. The objective is to enhance initiatives on environmental factors and health by examining and applying possible parallel processing of databases.

Objectives and initiatives in the near future

As apparent from this document, the Ministry of the Environment is carrying out extensive monitoring and registration of emissions from, and the occurrence of, environmental factors in the environment. The Ministry of Food, Agriculture and Fisheries manages control programmes for selected environmental factors in food. The National Board of Health manages a register of several categories of disease, some including information on causes.

In future there will be three main areas of initiative: Firstly, initiatives to adjust and improve monitoring and registration within the different areas. Secondly, initiatives to achieve better indications of the relationship between environmental factors and health. And thirdly, initiatives to elucidate and improve possible ways of parallel processing of databases.

Existing monitoring programmes and registration are adjusted and updated when required. This is to ensure that programmes and registration continuously illustrate objectives and results

optimally within the environment, health, food, the working environment, traffic, and urban and housing issues.

Especially worth mentioning in this context is the fact that the Ministry of the Environment will revise Danish monitoring efforts, and from 2004 include nature monitoring in the Danish Aquatic Monitoring and Assessment Programme, NOVA 2003. The revised programme (NOVANA) will cover the period 2004-2009. The programme will comply with international commitments to monitor and report on the state of the environment and nature.

Work will be carried out to follow up on the *indicators for the relationship between environment and health*, in the government's National Strategy for Sustainable Development. The coordinating working group (see section 6) will establish a subgroup that is to examine possible ways to develop a broader range of indicators for the relationship between environmental factors and health. This includes examining the needs and opportunities to establish monitoring of environment-related health effects in selected areas.

Relevant ministries will examine possible ways of attaining more and better information about the relationship between environmental factors and health via *parallel processing of databases within the different areas*.

The National Board of Health is in the process of following up a pilot project carried out by Medical Health Officers by reviewing registers and examining possible ways for linking to geographical information systems. On this basis, work on establishing a national geographical information system regarding sickness and mortality rates has been initiated. Two pilot projects are in the start phase.

Funding for analyses based on register data of the relationship between health and environmental impacts from especially chemical substances has been allocated in the Danish Finance Act 2002-2004 (see also sections 3.3, 3.4, and 3.7). Thus, a preliminary investigation has been initiated in 2002 to examine available options and obstacles. This investigation will serve as a start point for joint initiatives by the Ministry of the Environment, the Ministry of the Interior and Health, and the Ministry of Food, Agriculture and Fisheries to prepare an analysis report about available options and proposals and recommendations. The report will be available in 2003.



5.3 Research - needs and initiatives

Research and development projects on the relationship between environmental factors and health are an important part of preventive efforts. A large number of research and development communities in

Denmark and abroad take part in the general build-up of knowledge. In a number of selected areas, however, there is a need to enhance Danish knowledge building.

Objectives and initiatives in the near future

It is important to ensure that *research into the relationship between environmental factors and health*, currently taking place in many different institutes and institutions, is carried further. It is equally important that research is organised and coordinated in the best possible way, bringing the issue of the relationship between environmental factors and health into focus. This will also ensure efficient use of results achieved.

These fundamentally *broad research initiatives* will elucidate aspects such as:

- occurrence, fate, and distribution of environmental factors in the environment, the working environment, the indoor climate and in food,
- the extent of human exposure to environmental factors, including exposure of especially sensitive groups of people,
- the relationship between environmental factors and negative health effects, e.g. effect mechanisms,
- the development of tools to help prioritise and target initiatives and strengthen prevention,
- socio-economic assessments e.g. of the negative health effects stemming from environmental factors and of the benefits gained from prevention or limitation of negative health effects.

Section 2.1 and sections 3.1 to 4.9 include descriptions of a number of areas in which research can form the basis for targeted and preventive initiatives.

Funds have been allocated in the Danish Finance Act for implementation of a number of *development initiatives within the environment and health areas* in the period 2002 to 2004. These initiatives are to provide a better knowledge base and contribute to enhancing initiatives within the areas. The initiatives are described in the relevant sections.

Denmark will work to ensure that research into the relationship between environmental factors and health is accorded priority in *EU research programmes*. The 6th EU Framework Programme for Research and Technological Development was adopted in June 2002 and contains issues related to the environment and health. Thus, within the EU there is focus on the relationship between the environment and health, and Danish research communities can cooperate with other research communities and contribute to international research on the subject.

An overall assessment points at four areas central to future preventive initiatives. These areas may indicate to the Danish Research Councils, research communities and enterprises where the Danish authorities find cooperation on research and development beneficial to society as a whole, and where there might be a commercial interest in gaining further knowledge. Initiatives will e.g. enhance opportunities for enterprises themselves to assess health risks associated with their products and production processes by.

- *Research on cross-disciplinary issues about the relationship between the environment and health*

There is a need for better knowledge about the overall significance of negative effects from

chemicals to people throughout their lives. It is vital to gain knowledge about human exposure to environmental factors through thorough knowledge of the occurrence, fate, and distribution of environmental factors. Combination effects represent another central issue in the relationship between environmental factors and effects on health. Combination effects can occur from the simultaneous impact of several different chemical factors, or the simultaneous impact of different types of environmental factors, e.g. simultaneous exposure to organic solvents and noise. Other important issues include delayed effects of exposure to chemical substances; effects of long-term, low-dose exposure to e.g. odours and smells not normally deemed problematic; better knowledge about especially sensitive groups of people; and the significance of micro-organisms to our health and well-being.

There is also a need to develop new methods for testing and assessing chemical substances. These new methods must be more efficient, easier to use for both the authorities and producers, yield better results, and minimise use of animals for testing.

Furthermore, there is a need for knowledge on viruses in the environment and a need to develop methods for detection of viruses.

Finally, there is a need for more knowledge on the interplay between lifestyle factors and environmental factors, including a need for further knowledge on the significance of access to forests, nature, water, parks, and recreational areas for our health and well-being.

- *Endocrine disrupting effects*

There is a need to extend basic research into possible endocrine-disrupting effects in order to ensure greater knowledge about the mechanisms behind carcinogenic effects, effects on reproduction, and injury to the nervous system.

There is also a need to develop more efficient test tools to identify endocrine disrupters. It is important to establish a stable research community where systematic and continuous development work can take place in coordination with OECD activities.

Finally, there is a need to map the quantities of endocrine disrupters in the environment, how people are exposed, and the level of exposure of different groups of people.

As part of the realisation of the Danish research pool, DKK 40 million have been allocated to cross-disciplinary research into hormone-mimicking substances for the period 2003-2005.

- *Allergies*

There is a need for better knowledge about how chemical substances in ambient air, the indoor climate, and as food additives may aggravate and increase the incidence of allergies. There is a need to find out whether the indoor climate plays a special role in the development of allergies. Finally, there is a need for better knowledge on how chemical substances contribute to causing skin allergies, and how skin allergies can be prevented.

There is also need for much more precise knowledge about the number of people developing asthma and allergies due to exposure to environmental factors, or where environmental factors

play a significant role in the pathological picture. There is a need to establish broad knowledge-based national data comprising both exposure and effects-related data, and dealing with both validated questions and investigations.

- *Fine and ultra-fine particles*

There is a need for better knowledge about the mechanisms behind the negative health effects caused by fine and ultra-fine particles, including respiratory disorders, heart and circulatory disorders, and lung cancer.

In addition, there is a need for better knowledge about the extent and situations in which people are exposed to fine and ultra-fine particles from traffic. In particular, there is a lack of knowledge about the significance of exposure to fine and ultra-fine particles in busy roads.



5.4 Information, openness and risk communication

Active communication and a large degree of openness about knowledge, and, in particular, lack of knowledge, are important if the public is to be provided the opportunity of assessing risks. The many players disseminating knowledge and assumptions about the link between health and the environment have a great responsibility for ensuring that information is balanced and detailed.

Objectives and initiatives in the near future

The overall objective is to ensure adequate, good, and detailed information for all on possible risks and possible effects. Only this way will it be possible for individuals to protect themselves from unwanted negative health effects from environmental factors.

The Ministry of the Environment prioritises continuously providing scientifically sound environmental knowledge. Moreover, the Ministry is working to ensure best possible risk communication and risk management regarding the environment and health for the population and enterprises. The Danish Environmental Protection Agency is cooperating with the Danish Veterinary and Food Administration and the Danish Medicines Agency on the development of different models of risk management and on the possible establishment of a dialogue with retailers, the media, manufacturers, experts, consumer organisations etc. so as to get to know more about how best to communicate uncertain knowledge. In order to reduce the

contents of chemical substances in food products, the cooperating ministries will e.g. consider whether risk communication will be an effective means of motivating consumers to choose not to buy products containing substances that via the environment end up in food.

The Ministry of the Environment will continue enhancing the communication of issues on health and the environment in the form of campaigns and regular dissemination via newspapers, magazines, the Internet and so on. In order to provide the public with easy access to information and knowledge on the environment and health, the Ministry of the Environment has created a new web portal. The portal contains links to authorities, information centres, organisations and societies etc, other web portals and web sites, journals and encyclopaedias, as well as links relevant for children and young people.

The Ministry of the Environment is extending its communication of environmental data each year. Some of these data will be of relevance to the environment and health, such as information about the quality of drinking water or about wastewater. Such data are tools providing consumers and the public quick insight into environmental conditions in their home environment.

The Ministry of Food, Agriculture and Fisheries will continue to publicise the results from its regulation of retailers and restaurants - the so-called smiley-scheme. The aim is also to publicise the results on the Internet, where well-established search facilities exist. As of yet the results are only displayed in the stores/restaurants.

The Ministry of the Environment will ensure that consumers have access to independent, consumer-relevant information about environmental factors and health. In January 2003, the Minister of the Environment decided to establish the "Information Centre for Environment & Health". The Centre is to provide the public with accessible, practical, and relevant information on the relationship between the environment and health, while at the same time ensuring dialogue between industry and consumers.

Cooperation

6



Denmark is a well-organised country, where public institutions generally are well aware of each other's objectives, responsibilities, and tasks. This applies for both administration and research. This Strategy for Environmental Factors and Health has established a collective and enhanced point of departure and a basis to achieve more cohesive initiatives to protect the population.

Objectives and initiatives in the near future

The environment and health area is extremely broad, and covers both technical and administrative aspects. At the same time it is a dynamic area, where new finds of pollutants giving rise to health concerns, or new realisations that a pollutant is more serious than first presumed can very well lead to acute needs for changes or prioritisation, development of new strategies, or even amendments to legislation. New realisations in an area can mean interventions in many places to ensure the necessary initiatives. Often, several authorities will depend on each other's knowledge, and cooperation can be a prerequisite for being able to supply the necessary initiatives.

Cooperation at administrative level

Today there is a division of responsibilities between the ministries involved in regulating environmental factors and health. The National Board of Health has primary responsibility for general health monitoring, while the responsibilities of other ministries are more linked to preventive initiatives such as setting limit values and detailed requirements for the different sources of environmental factors.

In realising the Strategy, it may be beneficial to enhance coordination and cooperation in general. Better cooperation could be a framework to formulate future initiative areas and objectives, and to manage future problems within the area. In addition to this, there is the government wish that people should have access information about, and be involved in, setting priorities and initiatives by the authorities.

Therefore, it is proposed to set up a Cooperation Committee - a Coordinating Working Group - between the authorities for the environment and health. The idea is for cooperation between the Ministry of the Interior and Health, the Ministry of Food, Agriculture and Fisheries, the Ministry of Employment, the National Agency for Enterprise and Housing, the Ministry of Transport, and the Ministry of the Environment.

The objective of the Coordinating Working Group is to ensure coordinated and cohesive action against environmental factors that can affect health, and in particular within areas of common interest.

In particular, the Working Group should ensure that objectives and initiatives in this Strategy are followed up. The Working Group will highlight securing cohesion in the level of protection for food, the working environment, and the external environment and indoor climate. At the same time, there will be a significant benefit from cross-disciplinary focus on setting limit values for food, the working environment, and the external environment (see section 5.1). In this context, there may be a need to involve other players, e.g. from regional and municipal authorities, Medical Health Officers, industry, research, and organisations in sub-groups, or in some other way ensure that knowledge from these parties is included.

The Working Group will promote information and communication about environmental factors, health, and risks.

The Working Group will maintain and develop the integrated description of the area established by this Strategy, namely environmental factors and health. In 2003, the Working Group will submit a prioritised plan for work, and before the end of 2005 it will prepare a report on the Strategy for Environmental Factors and Health. The report will contain a review of the progress of the work to date, and proposals for future priority areas.

Project groups for relevant work areas could be set up under the Coordinating Working Group. For example, the existing project groups between different ministries could be linked to the Working Group. Or, a network could be established further to specific action plans, for example as has happened during the follow-up to the Dioxin Action Plan.

Research

See section 5.3 on research.



International cooperation

7



The relationship between environmental factors and health is also in focus in international cooperation. International cooperation is important to limit negative impacts from environmental factors, because problems are often the result of transboundary pollution and increasing global trade. Emissions of ozone-depleting substances is an example of a global problem that can only be solved through international cooperation. In the same way, trade in goods, which may contain chemical substances harmful to health, makes cooperation and coordination necessary.

Objectives and initiatives in the near future

Denmark will continue to work internationally to strengthen environmental work and improve health. This applies to work within the UN, the EU, and in bilateral environmental cooperation with Eastern Europe, Africa, Asia, and the Arctic. Danish initiatives in specific areas are described in the relevant section. Only a number of high priorities have been included.

The World Summit in Johannesburg in September 2002 set focus on a number of issues vital to sustainable development. At the Summit, the EU, with Denmark holding the Presidency, set priorities in areas with cross-disciplinary initiatives such as water and energy in connection with health, the environment, and combating poverty. The Johannesburg meeting also succeeded in a wording of the precautionary principle for the chemicals field to include health. For water and energy, the EU led the way in launching partnerships to ensure sustainable development in developing countries for these areas.

Denmark will also work to enhance global cooperation on hazardous chemicals in international decision fora with participation from countries throughout the world. Denmark was amongst the countries taking initiative for the UNEP decision to assess mercury. Furthermore, Denmark will work to create a global convention on all heavy metals, where mercury is just the first metal to be addressed. Denmark is also the Lead Country for efforts against mercury under the Arctic Council.

A Danish priority is to ensure that a number of conventions, already adopted and signed, actually enter into force. These include the Rotterdam Convention on prior informed consent (PIC) in countries exporting especially dangerous substances, the Stockholm Convention on phasing out persistent, organic substances (POPs), and the International Maritime Organisation (IMO) Convention on phasing out TBT in anti-fouling paint and regulations to prevent shipping disasters.

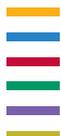
Within OSPAR (The Convention for the Protection of the Marine Environment of the North-East Atlantic), Denmark is the Lead Country for dioxin and endocrine disrupters. With regard to dioxin, the task is to collect data, prepare background documents, and coordinate work. Work on endocrine disrupters includes establishing an overview of the initiatives that have been taken, and inform about their status. Denmark is also active in OSPAR work on harmonising rules for discharges of chemicals and oil into the North Sea from offshore and gas installations.

Within HELCOM (the Baltic Marine Environment Protection Commission), efforts will continue to concentrate on activities to help countries align their environmental legislation with relevant EU directives.

In cooperation with the Greenland Home Rule Government, there will be focus on health and the environment in Greenland for persistent organic pollutants, heavy metals, and lifestyle factors.

In southern middle-income countries, in parallel with specific initiatives, Denmark will focus on strengthening the countries' ability to implement appropriate planning and regulation. Efforts will include focus on initiatives in areas such as water, sanitation, waste, and energy, all of which are significant to health improvement.

In spring 2002, the Danish government adopted a new Strategy for environmental assistance to Central and Eastern Europe for 2002-2004. The previous objectives for Danish support to Central and Eastern Europe have been retained, including efficient support measures within the environment, energy, the labour market, business, education, and agriculture. The environment remains the most important sector for support to Central and Eastern Europe.



Data Sheet

Publisher:

Ministry of the Environment, Danish Environmental
Protection Agency,
Strandgade 29, DK-1401 Copenhagen K
Telephone int + 45 32660100
Telefax int + 45 32660479
Internet <http://www.mst.dk>

Year of publication: 2003

Title:

Environment and Health are Closely Related

Subtitle:

Strategy and Action Plan to Protect Public Health against
Environmental Factors

Author(s):

The Danish Government

Performing organization(s):

The Danish Government

Abstract:

The first Danish overall strategy for the relation between environmental factors and health, presenting the Danish Government's outline of the importance of environmental factors for public health, and goals and initiatives for the coming years. The strategy provides a common framework for strengthened cooperation between authorities involved in the future efforts.

Supplementary notes:

Translation of: "Miljø og sundhed hænger sammen: Strategi og handlingsplan for at beskytte befolkningens sundhed mod miljøfaktorer" (The Danish Government, 2003)

Layout: Rumfang

Photos: BAM

Number of pages: 74 **Format:** A4

Number of copies: 500

ISBN: 87-7972-932-0

Printed by: Schultz Grafisk

Price (incl. 25% VAT): Free of charge

Distributed by:

Ministry of the Environment,
Frontlinien
Strandgade 29, 1401 København K
Phone +45 32660200
e-mail frontlinien@frontlinien.dk

Reproduction is authorized provided the source is acknowledged

Printed on 100% recycled paper **Cyclus**





Work to improve the environment is a high priority for the Danish government. One of the objectives of this work is to minimise environmental impacts and thereby prevent negative impacts on public health.

We have solid knowledge in a number of areas on how different environmental factors influence our health, but there are also areas that we know too little about for making targeted initiatives.

The government's objective with this strategy is to provide an overview of the significance of environmental factors for health and to establish goals and initiatives for the future. The strategy will create a common framework for enhanced cooperation between the authorities in future work.

Human health is influenced by both life-style factors and environmental factors. Life-style factors can include tobacco, alcohol, diet, physical exercise, and outdoor recreation. The government established goals and initiatives for life-style factors in "Life-long health - national objectives and strategies for public health 2002-2010".

This strategy covers impacts on health from different environmental factors. Environmental factors are chemical, physical, or biological factors which occur in the environment, in products, in food, in the working environment, or in the indoor climate.