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Intensified Product-oriented Environmental Initiative

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**Intensified Product-oriented
Environmental Initiative**

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The reports are, however, published because the Danish EPA finds that the studies represent a valuable contribution to the debate on environmental policy in Denmark.

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Preface

In modern-day Denmark, we use thousands of products - e.g. detergents, TV sets, cars, textiles, etc. All products affect the environment - when manufactured, when used and when disposed of.

One of the focal points of the Danish Government's 1995 Nature and Environment Policy Report, was the environmental impact from our production, use and disposal of products. One of the main conclusions in the report was that the serious environmental problems of our time call for the environmental protection provided so far to be supplemented with measures dealing with all aspects of product life-cycles. This needs to be done in close co-operation with those stakeholders who may influence the environmental impact of the products. The goal, then, is wider development, production and sale of environmentally sound products.

To follow up on this idea, the Danish Environmental Protection Agency has drawn up this proposal for an intensified product-orientated environmental initiative.

The proposal is aimed at politicians who take an interest in the environment and at all groups of stakeholders essential to any product initiative, including product developers, manufacturers, trading companies, environmental administration agencies, consumers, know-how suppliers, etc.

The Danish Environmental Protection Agency's proposal for an intensified product initiative hinges on contributions from round-table discussions with a number of important Danish stakeholders, on the Danish Ministry for Business and Industry's resource area analyses, on discussions with the environmental authorities in the Netherlands, Germany, Sweden and the European Commission, and on present Danish experience with product-orientated environmental measures. During the round-table discussions, industry, consumers, the retail trade, employees, green organisations, municipalities, counties and a number of sectorial ministries were represented.

Chapter 1 of the present proposal gives a summary of the following six chapters. Chapter 2 focuses on the national and global environmental problems that create the need for intensified product initiative. Chapter 3 describes the product initiative process and the overall environmental goals, industrial targets and objectives of the product initiative work. Chapters 4-6 analyse the framework and conditions for the products, market and stakeholders. The aim is to put together an outline of the

available scope for intensifying product-orientated environmental initiatives. Chapter 7 examines the Danish Environmental Protection Agency's proposals for areas of action and specific activities for the product initiative. Some of the proposals will involve quite new activities while others will emanate from or intensify existing activities in the product field.

The proposal is now being widely circulated for comments and will be presented and discussed at a series of events in the next six months as well. Its components and initiatives will be deliberated in the light of this debate and comments received before any policy-making commitments are considered.

As the proposal illustrates, the dialogue with everyone - from product developers and manufacturers to dealers and consumers - is of very great importance to the product initiative. Therefore, I very much hope that this proposal will be capable of fuelling a constructive, fruitful debate on how to intensify our product-orientated environmental initiative.

Copenhagen, November 1996

Erik Lindegaard, Director General of the Danish Environmental Protection Agency

1 Summary

This discussion paper presents the Danish Environmental Protection Agency's proposal for an intensified product-orientated environmental initiative.

The paper has materialised as the outcome of a series of round-table discussions and ongoing contact with the organisations of trade and industry as well as with relevant authorities.

Discussion paper

The purpose of this paper is to contribute to public debate on the organisation of initiatives in the product field in years to come - in particular, this paper should be discussed by and with the stakeholders affected by such action. One of the proposals includes discussing the overall objectives, components of the effort and proposals for concrete initiatives. The groundwork is also being laid down for discussions on possible ways of collaborating on such intensified efforts.

The paper has been widely circulated for comments and, in addition, will be presented at a series of events in the next six months. The components and initiatives proposed will be deliberated in the light of this debate and comments received so that the product-orientated environmental initiative can be presented for political decision-making.

This approach involves viewing the problems in a long-term, holistic perspective. Efforts can thus not be realised only by initiating a series of concrete initiatives. The process is continuous and must, in a number of years, turn development and consumption in a more environmentally sound direction - in continuous and close co-operation with the stakeholders.

The global challenge

The UN estimates that the world's present population will have doubled in the next 35 years. Many countries of Eastern Europe, Asia and South America are undergoing rapid economic growth. The poorest countries are justified in their hopes of - and at the same time their entitlement to - improving their living standard in the years ahead. This development will entail a marked increase in global consumption. If the depletion of the world's resources and the permanent destruction of the environment for future generations caused by an explosion in consumption are to be avoided, intensified environmental initiatives will be needed, aiming at all aspects of our product consumption.

Product, market and stakeholders

In other words, the environmental impact associated with the production, use and disposal of products needs to be reduced. These efforts must ensure that products are developed with far better environmental properties than those we know today. But these efforts must also ensure that more environmentally sound products can compete with environmentally inferior products - and in sufficient volumes to bring about environmental improvements. The focus therefore needs to be on the market in which the products are competing as well as on the stakeholders influencing that market.

The national challenge

It is a challenge for environmental policy to intensify product-orientated environmental initiatives in such a way that they can contribute to solving some of the Danish environmental problems and hence result in specific environmental improvements.

This initiative will prove a great challenge to Danish trade and industry at the same time as it affords crucial economic and industrial policy opportunities. If it is to succeed, an intensified product-orientated environmental initiative can only be implemented by active interaction between the public sector and trade and industry. In return, such interaction will consolidate the competitiveness of the Danish trade and industry in future years.

The product initiative

The paper examines the general framework needed to promote the availability and sale of less environmentally degrading products on the market. It surveys ways in which such framework conditions can be established, suggesting initiatives to intensify efforts within both existing and new intersectorial areas of action. It is proposed to conduct pilot projects in three product areas where the conceptual basis of an intensified product-orientated environmental effort can be tested and developed in a hands-on context.

Continuous process and dialogue

Action in the product field should take the form of a continuous process involving ongoing dialogue between the parties. Together, they must identify new initiatives and obstacles in order to develop, manufacture, market and sell new and less environmentally degrading products.

Refining environmental initiatives

Part of the environmental initiative is already targeted at such products. Compared to the all-round effort described in the paper, the present initiative is, however, aimed mainly at specific elements of importance for the environmental impact caused by products. The intention is not to suggest that the former environmental effort should be superseded by a new one. An intensified product effort must be a supplement.

1.1 The great challenge

The environmental space

The Danish government's 1995 Nature and Environment Policy Report, highlights the necessity of a long-term trend towards keeping our total environmental impact within a reasonable proportion of the global environmental space. We must, then, respect the limits that nature sets to our consumption of material resources and to the degree of stress we can impose on the environment for the sake of posterity. In other words, we must respect the concept of sustainability.

Former regulation

Over the past 25 years, environmental regulations have resulted in substantially less pollution from industry, power stations, wastewater treatment plants and other so-called point sources.

Product use is an environmental problem

But there are still a number of environmental problems which have proved difficult to handle. They are typically associated with the environmental impact from more diffuse sources and with society's consumption of resources in general. A considerable part of these environmental problems are linked to the widespread use of the products in all functions of society.

A particular product may seem harmless enough on the face of it, viewed in a larger environmental perspective. But however harmless it may look, an individual product may assume great environmental importance owing to the volumes in which it is manufactured or the substances it contains.

For these reasons in particular, increased focus on products is needed if the environment is to enjoy greater protection.

Local and global environmental problems

We see local environmental problems such as pesticides in the groundwater, environmentally hazardous substances in sewage sludge and oxygen depletion in our local waters. We see regional and global problems such as the depletion of the ozone layer, the spread of non-degradable substances hazardous to health and the environment, and the degradation of nature through e.g. desertification and eradication of the rain forest. We are also witnessing various new problems of which we do not yet know the full extent and consequences, e.g. the spread of oestrogen-like substances, the reduction of biological diversity and contributions to the greenhouse effect.

The effects on the environment of such products can all be related to one or more of the following four serious global issues:

- The spread of environmentally and health hazardous substances
- The increasing consumption of fossil fuels
- The consumption of non-renewable mineral resources

- The overexploitation of biological resources

Global growth

The global problems are being intensified by the growth of the world's population. More people mean greater pressure on nature and the environment. At the same time, increase of the living standard of the poor countries is a prerequisite for limiting population growth. Or to put it another way: growth in the population creates greater pressure on nature and the environment. It can only be stopped by increasing consumption - creating even greater pressure on nature and the environment in the process. And regardless of the growth in the population, the peoples of the poorest countries have a justified expectation of some improvement in their standard of living.

Commercial challenges and opportunities

Especially on the short view, an intensified product-orientated environmental initiative can make demands on trade and industry but, on the longer view, it implies commercial possibilities that will enable Danish trade and industry to manage itself in the increasing international competition.

It is crucial to Denmark that our environmental effort should not destroy our existing competitiveness. Unless Danish companies are competitive, it will eventually mean production closures. That would benefit neither the environment nor the Danish economy.

Given the increase in both the population and the living standard, there will be a constantly growing demand for goods and services. That will generate a rise in the demand for resources, which in turn will cause rising prices. The increase in consumption will also result in the environmental problems becoming greater and increasingly recognised among consumers. All in all, these factors will lead to an increased demand for products with improved environmental properties. They may be products free of substances hazardous to health and the environment, for instance; products that are totally recyclable, products with a longer life and products with a lower consumption of raw materials or energy.

There is, therefore, a potentially great opportunity to orchestrate Danish product initiatives so that Danish companies are among the first to be able to supply a rapidly growing global market with products displaying improved environmental properties.

The specific onset of increased demand for products with improved environmental properties is difficult to predict for the various product groups. On the other hand, the competitive edge lies in being prepared to meet that demand when it comes.

Public/private development effort Danish companies do have the potential. Individually, however, their resources and environmental know-how are barely sufficient to see such efforts through. Action is thus needed in close co-operation between the public sector, the companies and their organisations.

Danish lead in international efforts There will be an independent Danish interest in creating a competitive lead on the market for more environmentally sound products. If, however, a product-orientated environmental initiative is to meet the global environmental challenges, this will require similar international efforts in which Denmark should be among the trend-setters.

More can be read about global growth and the environmental and commercial challenges in Chapter 2.

1.2 What is a product-orientated environmental initiative?

The nature of present environmental strategies

The present environmental efforts have been roughly modelled on four different basic approaches:

Sources A source-orientated approach - in which efforts are aimed at reducing the discharges from the various sources impacting on the environment. Sources include e.g. industrial enterprises, wastewater treatment plants, waste incineration plants, farming, power stations and cars. Efforts include stipulations regarding purification or the use of cleaner technology.

Medium The medium-orientated approach - aiming to ensure an acceptable quality of soil, air, sea, groundwater and fresh surface water. Among other things, the approach ensures that a policy stance is taken on the need, if any, for actions against discharges to the environment for reasons of environmental quality.

Substances The substance-orientated approach - in which the properties and fate of chemical substances, resources or residual products in the environment underlie all action. These efforts also include hazard and risk assessment.

Products The product-orientated approach - which is based on the concept that the overall environmental impact can only be understood - and efforts properly prioritised - if products are contemplated throughout their entire life-cycle from cradle to grave.

The present product-orientated efforts has mainly included the development of tools for analysing and assessing the environmental impact of

products and the development of a public green procurement policy. Furthermore, efforts have been directed towards individual, selected components of the product life-cycles with a view to solving specific environmental problems.

What is the underlying idea of the product initiative?

The purpose of an intensified product-orientated environmental initiative is an increased development, manufacturing and marketing of environmentally sound products on the market in replacement of existing, more environmentally degrading products.

Sale

The present paper particularly focuses on the sale of more environmentally sound products. A product-orientated environmental initiative must stimulate the market to increase its marketing and sale of products with good environmental properties. A product-orientated environmental initiative therefore takes as its basis the highly complex interaction between products, stakeholders and market. Concrete supportive initiatives must ensure that, to a greater extent, this interaction results in the development and marketing of environmentally sound products.

Working on an intensified product initiative

A long-term holistic process

An intensified product initiative is a framework intended to unite existing and new actions. It is an attempt to treat environmental problems in a holistically oriented fashion. Such action cannot be implemented merely by starting a series of concrete initiatives; nor do the results of such action become quickly visible.

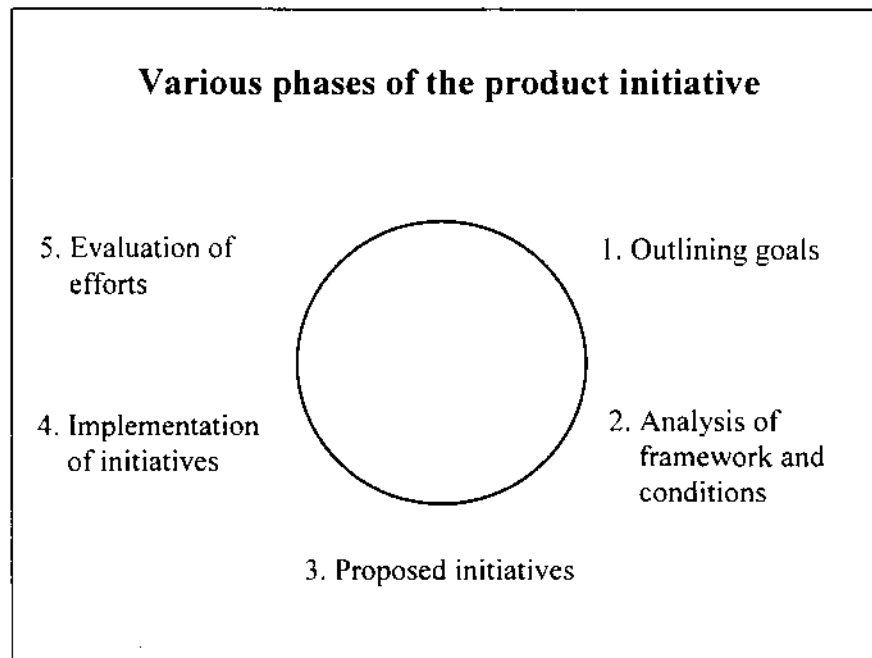
It is a continuous process which, in a number of years, must turn product development and consumption in a more environmentally sound direction - a never-ending process but a process in which stakeholders continuously improve products in close co-operation.

Stakeholder dialogue

A dialogue among the stakeholders is a key concept in this process. The dialogue is not just a means adopted as part of a product initiative - to a major extent, the dialogue is the product-orientated environmental initiative. It requires the participation and commitment of many parties with highly diverging interests.

Cyclical process

The process can be conceived as a cycle in which the different phases are repeatedly traversed. Efforts must constantly be improved on the basis of the results and experiences achieved. A product-orientated environmental initiative can be described as a process in five phases:



More can be read about the product initiative as a process and dialogue in Section 3.1.

What are the overall objectives of the product initiative?

Despite being an environmental initiative, commercial targets are largely in focus. The working premise is that more environmentally sound products will only be developed and sold if this policy agrees with business economics interests of the companies and with the other stakeholders' interests - if not on the altogether short view, then in any case on the slightly longer view.

Environmental objective

The environmental objective of such efforts is to contribute to the development, production and marketing of products with improved environmental properties in order to allow a reduction in the total impact from the production, use and disposal of products.

More specifically, the aim is to restrict the spread of environmentally and health hazardous substances, the increasing use of fossil fuels, the over-exploitation of biological resources and the consumption of mineral resources that cannot be renewed.

Commercial objective

The commercial objective behind the initiative is to strengthen the competitiveness of the Danish business community by establishing a basis for the development, production and marketing of products with improved environmental properties.

Process objective

The overall objective of the product initiative is to involve all stakeholders in realising the environmental and commercial goals. At the same time, the aim of the work is for Denmark to influence its international business partners to take similar action.

More can be read about the overall objectives in Section 3.2.

1.3 Framework and conditions for product initiatives

The overall conditions

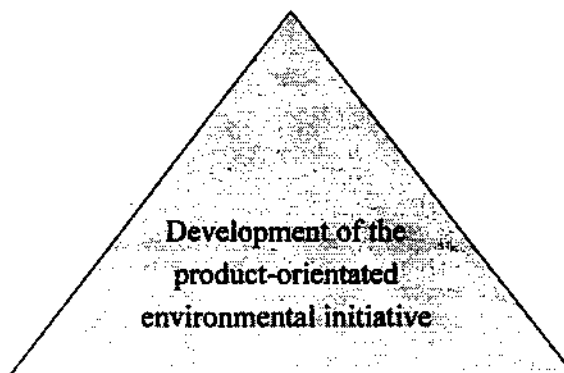
The framework and conditions of the product-orientated environmental initiative are the interactive area between the product, the stakeholders and the market. Within this area, the possibilities for developing and marketing products with improved environmental properties are determined.

If consumers and purchasers do not demand environmentally sound products, these products will never find their way onto the market. If environmentally sound products do not exist, the market will not be able to make them available to the consumers. If the market does not inform consumers of the environmental properties of the products, consumers will have no way of knowing whether they are buying the environmentally sound products, etc., etc.

Product initiative conditions

The product perspective is designed to ensure:

- *that products are developed which have a smaller content and emission of environmentally and health hazardous substances, reduced energy consumption, and a smaller content and consumption of renewable and non-renewable resources.*



The market perspective is designed to ensure:

- *that products are developed and marketed which can compete on price, function, quality and the environment*

The stakeholder perspective is designed to ensure:

- *that each individual group of stakeholders can and will contribute to a reduction of the environmental impact of the products.*

The analysis in this paper can only be general, owing to the great variation in conditions prevailing from one product to another. Any concrete action with regard to selected product groups must therefore analyse the conditions and interaction on a more product-specific basis.

The nature of the product-related framework and conditions

In principle, the product-orientated environmental initiative is directed towards all products manufactured or consumed in Denmark. The initiative therefore includes both import and export products.

What are products?

Products should be taken to mean both physical products and services which in some way generate an environmental impact - for example, cleaning and transport. In addition, products means both the products utilised by the end-user and the semimanufactures forming part of further manufacturing.

15,000 product groups

The Danish market boasts a very large number of products. The foreign statistics record trade in approx. 15,000 different product groups. Within these groups there are many different articles. To these must be added the services.

The product-orientated environmental initiative is especially directed towards the products that will be developed and marketed in the next few years. Since one generation of products is superseding the next one at an ever increasing rate, efforts must be expected to penetrate quickly.

Action priorities

It is proposed that action is targeted primarily at products which have a substantial impact on the environment and where such action stand a reasonable chance of bearing fruit. Specifically, this means that work on the product initiative should include prioritising products and the environmental properties calling most urgently for action will be selected in each individual case.

Overview of the environmental properties of products

Any effort to reduce the overall environmental impact of a product requires an overview of the environmental conditions governing all phases of the life-cycle of a product, from the extraction of raw materials to production, distribution, use and disposal. Such a precise overview of environmental properties is, however, only necessary in certain cases. Often, a more general evaluation will be sufficient and efforts to improve the environmental properties of the product will often focus on selected environmental properties or on selected parts of the life-cycle of the product.

More can be read about product conditions in Chapter 4.

The nature of market framework and conditions

Competing on price and quality

On the market, competition is based primarily on product price and quality and, only to a limited extent, on the environmental properties of products. If the product initiative is to succeed, the products developed and marketed must be able to compete on price and quality as well as on the environmental score. Therefore, it is vital, both nationally and internationally, to attach greater importance to an improvement of the competitive situation for products with good environmental properties.

Light-green consumers

On the Danish market, various surveys show that between 1/3 and 1/4 of consumers would be ready to show consideration for the environment in their choice of consumption.

Options and information in the shops

However, there are a number of conditions that have to be fulfilled before consumers can show such considerations. The more environmentally sound articles must be available in all shops, and they must be easy to find. There must be easy access to simple information on the environmental properties of the goods - primarily in the shops. In addition, the environmentally sound goods must not be appreciably more expensive than the alternatives.

A central aspect of the product-orientated environmental initiative is to ensure consumers easy access to adequate and simple product information.

The domestic market is important

For most Danish companies, the domestic market is essential to sales and earnings. In a number of cases, the domestic market via i.a. statutory environmental requirements also gauge of future environmental requirements on products on the international market.

For certain product groups, e.g. pesticides, there is great international awareness of the Danish regulation as new Danish environmental requirements are expected to rub off on the control measures in other countries.

A series of international surveys show that there is a positive correlation between a high level of protection and large-scale environmental initiative on the one hand, and the competitiveness of trade and industry on the other. But a balance is needed to ensure that the environmental requirements are devised to retain the international competitiveness of companies while the Danish market remains of interest to foreign companies.

Approx. 60% of Danish goods production are exported and, similarly, some 60% of the goods sold on the Danish market are imported. Denmark is thus strongly integrated in the global market - primarily with highly industrialised countries where the markets resemble the Danish market in many ways.

Action within the framework of international agreements

Intergovernmental control and international agreements governing trade relations, products and the environment are assuming ever greater importance for environmental efforts. On the one hand, the agreements provide a framework stipulating the extent of independent national environment policy. On the other hand, they allow the individual country to influence environmental considerations extending beyond its national frontiers. This primarily involves EU regulation and global trading controls within the framework of the WTO. Furthermore, the European and international standardisation work is of great practical importance for the requirements made of the design and manufacture of a product.

Active international control for the benefit of the environment

A Danish product initiative must be developed in accordance with the principles of the free movement of goods, as defined in the EU and WTO. The development of international regulations will assume great importance both for international and national environmental efforts, including the framework for a product-orientated initiative. Therefore, it is of great importance to work actively to ensure that environmental requirements are given greater clout in international agreements.

Compared to a Danish initiative, an EU regulation in the product field will, however, have a much wider impact.

There is need and scope for a Danish initiative

Both a need for and possibilities of an independent Danish product initiative are present. A Danish initiative must exploit all the possibilities afforded by international regulation and be capable of improving marketing conditions for more environmentally sound products on the Danish market. At the same time, Danish efforts must take place in active cooperation between public authorities and Danish companies in order to consolidate the competitiveness of the companies.

More can be read about the market conditions in Chapter 5.

The stakeholders' conditions

The stakeholders' active participation in the product-orientated environmental initiative is of vital importance for the achievement of the desired effect of the initiative. Individually and as a team, the stakeholders make absolutely vital decisions that are of importance to design, materials, production, transport, supply, demand, consumption conditions and

waste management. Finally, these decisions determine the environmental impact caused by the individual product as well as by overall consumption.

Product development/design

The product developer's and designer's choice determines factors such as materials, product life, resource consumption during use and potential for recycling.

Production

The manufacturer engineers the production process and thus influence the environmental impact. The manufacturer should not be taken to mean solely the maker of the final product but also the maker of energy and raw materials, semimanufactures and consumables used in the manufacture of the end-product.

Distribution - transport and trade

Distributors like the importer, the forwarding agents, the conveyers, the wholesaler and the retailer are intermediaries in the product chain from manufacturer to consumer. Among other things, they thus influence what products can be bought and how the products are transported.

Consumption

The consumers' choice of products is, of course, the basis of the actual demand and is thus vital in the choice of products to be developed, manufactured and supplied on the market. Major public enterprises are a very important type of consumer in this context.

Other stakeholders

A number of stakeholders have only indirect bearing on the underlying conditions for products:

The financial sector furnishes financing and may in its own interest demand environmental information as well as eco-conscious behaviour.

Researchers and others who develop know-how on environmental conditions influence which environmental problems are discovered and for which solutions are found.

Those disseminating knowledge have a great bearing on the know-how available to other stakeholders.

Parliament, authorities, and national and international organisations establish the regulations and the "climate" that define the framework conditions of the environmental and industrial policy for the stakeholders. State and municipal regulations of waste handling are an example of this.

Special focus on product developers, dealers and consumers

There are three groups of stakeholders in particular who should be brought into sharper focus than they have been in the existing environmental efforts. They are the consumers, the dealers and the product developers. Product development is often, but not always, undertaken by the manufacturer. There was formerly a greater focus on the authorities and the manufacturers. Consumers, dealers and product developers are, however, essential to a product strategy since they largely determine the supply and demand openings for products with improved environmental properties. The paper therefore contains detailed descriptions of the three groups of stakeholders.

The stakeholders' conditions

It is necessary to understand the conditions on which the various stakeholders are willing and able to participate - including especially their motivation, their resources and the legal aspects of importance to the product initiative.

Motivation

Stakeholders' motivation is determined primarily by their ethics, their resources and the competitive situation entailed by any change in behaviour. Efforts in the product field must support the pioneers as well as increasing motivation among the more cautious stakeholders - i.a. by concentrating efforts on external constraints such as resource and competition factors.

Resources - know-how, time and money

It takes know-how, time and money to get started. Acquiring the knowledge needed as a basis for the various stakeholders' behavioural decisions is generally a problem. This applies to knowing what the essential environmental problems are, which environmental problems are associated with individual products, and what the individual stakeholder can do to help solve those problems.

All conversion processes cost resources to begin with, and any gains in the form of savings come only on the slightly longer view. Products with improved environmental properties will generally be more expensive and will remain so until a stable and reasonable demand for these products arise. Similarly, limited demand is a barrier to development and launching of more products with improved environmental properties onto the market. It is thus pivotal to consider the use of economically stimulating instruments as part of the product initiative.

Legal aspects

The legal aspects are important when the rules play a significant part in ensuring that products are not hazardous to health or the environment, or where such rules must ensure the availability of essential information.

More can be read about the conditions for the stakeholders in Chapter 6.

1.4 Proposals for specific initiatives

Analysis of framework and conditions leads to a number of proposals for specific initiatives. As already mentioned, this is the impetus needed to start a continuous process that will have to be repeated and adjusted concurrently with the development of products with improved environmental properties.

The proposal for an intensified product initiative invites action in a number of new areas while, at the same time, changes or reinforcements are made to efforts in various existing fields. This is reflected in the proposals for specific initiatives and areas of action.

The paper has been widely circulated for comments. No new overall paper will be drawn up on the basis of the hearing but the Danish Environmental Protection Agency will deliberate the proposals for specific initiatives in the light of the comments received and the debate before any initiatives are submitted for political consideration. The proposals are thus up for debate. The proposals are described in detail in Chapter 7.

Initiatives as the start up of the process

The following areas of action are proposed in the paper:

- Declaration of long-term environmental goals and behavioural expectations
- Knowledge access
- Development of a stable market for environmentally sound products
- Initiatives in three product areas
- Support to promote "cleaner" products
- Ban on the use of selected chemical substances
- National co-ordination
- International action

The specific proposals for action in the eight main areas are described below.

Long-term environmental goals and behavioural expectations

Declaration of priorities

The paper contains the Danish Environmental Protection Agency's initial suggestion for the environmental goals that should be assigned top priority.

Ambitions for the stakeholders

Environmental goals have been laid down for the problem areas to which special priority has been assigned by the central environmental authori-

ties. They are long-term goals intended to provide guidelines for the work on product-orientated environmental initiative.

Expectations on the stakeholders' behaviour

The goals must primarily be attained by offering consultancy to developers, manufacturers and dealers. In continuation of the goals, a number of the behavioural patterns expected from the stakeholders by the authorities have thus been drawn up. Or to put it another way, the behavioural expectations describe the activities which the product-orientated environmental initiative wishes to promote in the individual stakeholder in order to achieve the long-term objective.

Area	Behavioural expectations	Long-term environmental goals
Substances with major environmentally and health hazardous effect	Substitution, especially of those substances on the Danish EPA's list of undesirable substances	Phasing-out
Xenobiotics with unknown effect	Substitution to environmentally acceptable substances	Reduction in use of substances with unknown effect
Greenhouse effect	Radical energy optimisation and re-engineering to CO ₂ -neutral energy sources	CO ₂ emissions to be halved by the year 2030
Ozone layer depletion	Phasing-out of all substances	Restoration of ozone layer
Smog	Reduction of VOC and NOx emission	No effect on humans and ecosystems
Nutrient impact	Reduction of emissions	No effect on ecosystems
Biological and other renewable resources	Increase of resource efficiency, use of resources from sustainable operations	Use only resources from sustainable operations
Mineral resources and hydrocarbons	Increase of resource efficiency. Substitution to resources under less strain	Minimise resource loss, particularly for resources with less than a 100-year supply horizon

List of undesirable substances

The Danish Environmental Protection Agency has drawn up a draft list of undesirable substances which should be attempted to be replaced with other substances. The list is published in the Danish EPA's report on "Status and Perspectives for the Chemical Field".

Efforts to promote stakeholders' understanding and grasp of the environmental agenda should include the additional generation of data and development of priority-setting criteria as well as the further development and concretisation of the environmental goals in dialogue with the stakeholders.

Knowledge access

There is a pronounced need for the dissemination of simple and readily accessible knowledge on the environmental goals and the environmental properties of the products to the consumers, purchasers, dealers and other stakeholders. The knowledge standard and need for know-how will vary greatly for the different stakeholders.

Dissemination of information

The Danish EPA proposes discussions are opened with the stakeholders on ways of generating relevant knowledge on the environmental impact of the products and of passing it on from the manufacturers and importers to the consumers - a dissemination process that will often be effected via the wholesalers and retailers. These discussions should also include the question of imposing an actual duty to inform, for gradual introduction in selected product areas.

Environmental product declaration and instructions

The Danish EPA proposes that a concept of voluntary environmental product declaration and environmental instructions is developed for selected product groups. The concept could be based on, e.g. the use of criteria taken from eco-labelling schemes and purchasing guidelines.

Eco-labelling

The Danish EPA will work actively to disseminate eco-labelling. In order to speed up the introduction of eco-labelled Danish products, the Danish EPA will look into the possibilities of supporting company efforts on adapting products and preparing applications for eco-labelling.

The EDIP method

The Danish EPA proposes active promotion of the application of Environmental Design of Industrial Products (EDIP). EDIP is a tool for developing environmentally sound industrial products. It designed in close co-operation with a number of industrial companies. One way of doing this is to incorporate the method into a PC tool, ensuring the adaptation and further development of the method, developing databases and facilitating access to these databases.

Environmental management

The Danish EPA and other stakeholders should work - by influencing international forums and supporting a green procurement policy - to integrate life-cycle assessments and a green procurement policy on equal terms with the operational side of environmental management work. During the initial phase, this should take place in the public sector and in selected trades and industries. The Danish EPA will initiate discussions with the relevant stakeholders on this topic.

The Danish EPA proposes that further considerations are given to the need and possibility of establishing a resource centre dealing with the environmental properties of products.

Developing a stable market for environmentally sound products

A stable market for products with improved environmental properties may form the basis of increased development, production and marketing of these types of product on the market as a whole. This presupposes a better know-how available to purchasers and possibly a sizeable economic commitment for a period in order to create and support such a market.

Green taxes have been the object of in-depth analyses in other contexts. Such taxes are also a relevant instrument in this context. The use of taxes should be evaluated and compared to other instruments relating to the organisation of new efforts. Relevant stakeholders should participate in these considerations.

One of the intentions of a targeted, green public procurement policy is to create a stable market for products with improved environmental properties. A green public procurement policy is, however, still far from penetrating, which means that companies offering such products have had only a very limited degree of success with sales to the public sector.

One of the essential challenges for the product-orientated environmental initiative is thus to boost public demand for green products.

As part of the Danish Government's action plan for green public procurement, government agencies and companies were directed to draw up a green procurement policy and action plan in 1995. As this work is gradually being systematised and organised, there is a growing demand for information and other tools to enable public procurement to be made in a more environmentally sound manner.

In the autumn of 1996, it is estimated that 2/3 of the institutions have drawn up or are in the process of drawing up green procurement policies with accompanying action plans. Some public institutions have been active for several years, and companies such as Danish State Railways (DSB) and the Danish Armed Forces are good examples of pioneering companies. Also county and municipal authorities are increasingly organising environmentally sound procurement.

Active support for green procurement

In general, the Danish EPA will support the action plan for a green public procurement policy in the years to come by means of proposals for necessary initiatives.

The Danish EPA proposes that, as a starting point, public authorities should be obliged to invite tenders in a way that enables environmental considerations to be factored into the evaluation of bids. The EU Public Procurement Directives open up the possibilities of this.

The Danish EPA will continue to propose improvements in connection with the current revision of the EU Public Procurement Directives, thereby reinforcing possibilities of including environmental considerations in purchasing.

Moreover, co-operation with a number of large public purchasers must be intensified. These stakeholders may make requirements regarding, e.g., environmental management, environmental qualifications and choice of materials.

Purchasing guidelines

The Danish EPA will publish environmental guidelines for public purchasers for a number of product groups, some of which are also of relevance to private purchasers.

Goals for greening government procurement

1997 will see the start of a 2-year scheme registering public purchasing of less environmentally degrading products. If the registration provides the basis for doing so, the Danish EPA will propose that quantitative goals are set for government procurement of less environmentally degrading products within product groups selected.

Furthermore, the Danish EPA will consider the possibilities of providing support for specific activities in connection with green public procurement policy.

In practice, many counties and municipalities have a green procurement policy in one or more areas. Also in the years to come, the Danish EPA will continue its collaboration with counties and municipalities, including the National Association of Local Authorities and the Association of County Councils in Denmark.

Initiatives in three product areas

As a supplement to the various specific intersectorial initiatives, the Danish EPA proposes that pilot projects are initiated in selected product fields. These product-targeted efforts must be expected to yield a number of environmental improvements while the pilot projects will be of use in

the more extensive work on the product-orientated environmental initiative.

Product area panel

As part of the specific pilot projects, the Danish EPA proposes that a panel is set up for each of the product areas. The stakeholders central to the particular product field should participate in this panel. An essential task for any product panel will be to draft action plans laying down commercial and environmental goals for the product field, describing the stakeholders' specific tasks, and proposing specific initiatives and instruments. The action plan should be in the nature of binding agreements between the stakeholders involved.

Three pilot areas

Initially, the Danish EPA proposes that efforts are instigated for three product areas which have already been analysed in such depth that a panel may be set up and an action plan drafted immediately. The three areas are:

- Textiles
- Electronics
- Transportation of goods

These areas have been selected because they cause major, but different, environmental impacts, and function under very different commercial and market conditions. Together, they will reflect essential parts of the spectrum that may be included in an overall product initiative with regard to objectives, instruments and the involvement of different stakeholders. The areas have also been chosen because progress on environmental initiatives in general is advanced and/or because there are central stakeholders who are willing to spearhead a product initiative.

Analysis of the resource areas

In parallel with the above effort, the Danish EPA proposes that analyses are made within each of the resource areas of the Danish Ministry for Business and Industry, identifying some product areas in which the potential for an intensified product initiative can have great environmental and commercial impact. On this basis, efforts can be initiated in more areas than the above three areas.

Support to promotion of cleaner products

Four-part subsidy scheme

The Danish EPA is of the view that, for a period of time, economic support will be needed for a number of the initiatives proposed for intensifying the product initiative. This will mean e.g. subsidies for method development and knowledge building, for product development, for the launching of products with improved environmental properties and for the further development of waste treatment systems. Therefore, the Dan-

ish EPA will investigate the possibilities of having these activities covered by a subsidy scheme.

The organisation of a subsidy scheme targeted at cleaner products should be considered in connection with the expiry in 1997 of the existing action plans for cleaner technology and waste and recycling.

*Environmental performance
of small and medium-sized
companies*

There has been a great interest in appointing employees in smaller companies through the existing support programme for the environment and the working environment. The Danish EPA proposes to extend this opportunity so that companies can also apply for funding to appoint employees to work on the environmental impact of products - this applies to production companies, the wholesale and retail trade as well as to interest groups and NGOs occupying a central position in relation to the sale of products to the market.

Use regulation

Ban on the use of selected chemical substances

The Danish EPA will continue to assign high priority to regulating the use of substances known to have a hazardous effect on health or the environment. For substances with a known and major environmentally and health hazardous effect, the Danish EPA's aim is to prevent their general use - except where explicitly permitted. The main effort will be directed at influencing EU regulation in this field.

In addition, it will be attempted, to the largest extent possible, to direct efforts towards the chemical substances on the Danish EPA's list of undesirable substances while endeavouring to tie actions in with international work within this field and co-ordinating them with the use of other control instruments. In 1997, the Danish EPA expects to single out 20-40 of the substances on the list with a view to regulating their use.

*Co-operation with the other
ministries*

Co-ordinating national initiatives

The Danish EPA proposes that discussions are initiated with relevant ministries on ways of supplementing intersectorial areas of action with better national co-ordination.

A large number of the control instruments being used today within the purview of the Ministry of Environment and Energy and other ministries affect more or less directly the development and use of products with improved environmental properties.

Even today there are many activities that make a positive contribution to the product initiative. An intensified product initiative should promote work on a more co-ordinated outcome of major public initiatives of im-

portance to the environmental impact of products. Important ministries in this context are the Ministry of Labour, the Ministry of Housing and Building, the Ministry of Business and Industry, the Ministry of Research, the Ministry of Agriculture and Fisheries, the Ministry of Transport and the Ministry of Education.

International efforts

*Efforts directed towards EU
and standardisation work*

A number of stakeholders should actively try to influence the international bodies to support the product initiatives taken. This is with special reference to the European Commission, which has shown great interest in the Danish initiatives in this field. Also within the framework of the Nordic Council of Ministers, product efforts will be intensified, the future Norwegian presidency having designated this a main area of action. Furthermore, efforts should be concentrated on influencing the international standardisation bodies with a view to ensuring the integration of environmental considerations in future product standards.

2 The environmental policy challenge of a global market with global growth

2.1 Introduction

Far from sustainable development

Both in Denmark and in other industrialised countries, existing environmental initiatives have been incapable of solving a number of central environmental problems. This has been described in the Danish Government's 1995 Nature and Environment Policy Report /1/, which ascertains that although considerable results have been accomplished within most sectors, we are still a long way off sustainable development in a number of essential areas. This should be seen particularly in the light of the fact that a pronounced increase is expected, globally, in both the population and the standard of living.

Bearing this in mind, we need to ask what characterises the national and global environmental problems facing us today. How can the current environmental initiative be intensified so as better to solve these problems? What framework and conditions are needed for a consolidated effort? What is the choice of specific initiatives to be initiated if we want to intensify the environmental efforts?

Combining a high standard of living, strong competitiveness and a better environment

In this proposal, the Danish Environmental Protection Agency (EPA) attempts to help answer these questions. The basic assumption is that it *is* feasible - a high standard of living and strong competitiveness *can* be combined with environmental efforts with a far greater capability for meeting the challenges facing us today.

2.2 National and global environmental problems

Resource consumption and products rather than point sources

Over the past 25 years, Danish efforts in the environmental field have brought the discharges from industry, power stations and wastewater treatment plants - the so-called point sources - largely under control. Indeed, both the Nature and Environment Policy Report and other analyses in the field have concluded that the present problems are not so much associated with point sources but are, to a far greater degree, linked with society's general resource consumption and the use of products in all functions of society.

Serious environmental problems

We see local problems like pesticides in the groundwater, environmentally hazardous substances in sewage sludge and oxygen depletion in our local waters. We see regional or global problems like the depleted ozone layer over the northern hemisphere, the spread of non-degradable substances hazardous to health and the environment, desertification and eradication of the rain forest. We are witnessing a series of new problems the full scope and consequences of which we do not yet know - e.g. the oestrogen-like substances, the greenhouse effect and the rapid reduction in biological diversity.

Four central factors

Although the scope and nature of environmental problems vary globally, all of the most severe environmental damage can be traced back to one or more of these four factors:

- The spread of environmentally and health hazardous substances
- The increasing consumption of fossil fuels
- The overexploitation of biological resources
- The consumption of non-renewable mineral resources

Spread of substances hazardous to health and the environment

Not only are a number of environmentally and health hazardous substances used in production processes but a large number of these substances are also spread through our use of products. There is widespread use of xenobiotics in production and products, and our knowledge of their impact on the environment and health is often limited. Our knowledge is especially limited when it comes to the longer-term implications of their spread for our health and the environment.

Increasing use of fossil fuels

The increasing use of fossil fuels is depleting the resources of the earth and generating emissions of greenhouse and acidic gases, contributing substantially to the greenhouse effect and the acidification of water and soil.

Overexploitation of biological resources

The current exploitation of biological resources is so extensive that we are experiencing undesirable effects on our ecological systems - particularly in the form of a severe reduction in biodiversity and genetic stock. Some of the ancillary agents used for exploiting resources, especially for the production of foodstuffs and other industrial raw materials, also cause problems when spread to the environment.

Consumption of non-renewable mineral resources

Finally, the growing consumption of mineral resources, which cannot be renewed, affects both the environment and resources. So far, mineral resource deposits have generally been abundant but an increasing number of problems must be anticipated in ever more areas.

The problems described are all characterised by being very difficult to survey and, on the face of it, difficult to do anything about. They already present a number of serious perspectives as the situation appears today, but are further intensified by the growth in the population of world.

Global growth needed

Assuming there is no change in the standard of living, any increase in the global population will generate greater pressure on the environment and an increasing drain on resources. If indeed population growth is to be slowed down, the UN /2/ presupposes some growth in perceived wealth. According to UN population development experts, the only way to slow down population growth is to substantially raise the standard of living in countries with a low standard of living and high population growth. In a mean growth forecast, it is estimated that by 2030 the population will have stabilised at about 10 billion people enjoying a standard of living that is two to four times higher than today. Given these conditions, the global gross national product (GNP) may thus be expected to be four to eight times greater than today.

Growth on its way

The growth in the standard of living is on its way in many of the populous developing countries. Countries like China, Indonesia, a.o., are experiencing annual growth of 10-15% in their GNP. So, the essential question is not whether we want growth or not, but how we are going to meet the challenge posed by global growth.

Increased growth cause greater impact on the environment

Increased wealth will lead to a corresponding growth in the consumption of products and services with a resultant consumption of resources and an overall impact on the environment unless drastic action is taken to prevent such a development. The environmental perspective must be taken very seriously and, at first sight, must be considered rather difficult to handle - at least on the basis of the existing environmental initiatives in the industrialised world.

2.3 The environmental challenge

In its Nature and Environment Policy Report, the Danish Government declared that our long-term environmental policy must ensure that human activities do not have a negative impact on the cycle in Nature and that society only uses resources to an extent that leaves a sufficient quantity available to meet the needs of the global population and future generations. Denmark thus needs to work towards a balance, in which its population on average does not consume more natural and other resources than those available and does not create more pollution than the eco-cycles can handle.

The environmental space

The concept of the environmental space can be used for illustrating these points. In principle, the environmental space for any kind of impact on the environment can be computed as a total permissible quantity of consumption or pollution per person per year. The environmental space is related to natural environmental frameworks, not to specific social activities.

More products within the environmental space

There is thus every possibility that more products can be manufactured and more needs fulfilled within the framework of the environmental space. This must be done by adopting the continued development of cleaner, less resource-consuming and contaminating products. It must be done by increased recycling. It must be done by substituting particularly environmentally or health hazardous substances. It must be done by using products with longer life.

The Nature and Environment Policy Report demonstrates the current need to change consumption and production patterns if the environmental space is to be ensured. With the present level of technology and the above-mentioned expectations of population growth and the standard of living, resource consumption and pollution must be reduced by a factor of 4-8 in order to prevent the environmental impact exceeding its present level. In fields where the environmental impact is already too great, reduction must be even greater.

Problems from diffuse sources and the size of consumption

These problems can only be solved by efforts targeted at achieving a truly effective reduction in the environmental impact from production, use and disposal of all products used in society. Our current environmental problems are largely characterised partly by stemming from diffuse sources and partly being directly proportional to the size of consumption.

Possibly harmless on the face of it

A specific product may seem harmless enough on the face of it, seen in relation to the state of the environment in a larger perspective. Yet, however harmless it may look, an individual product may contain, e.g., one or more substances that can be damaging to the environment.

Environmental damage may occur if the product is used wrongly, falls to pieces, is not correctly disposed of or is used in such large quantities that vast amounts of hazardous substances are spread with it.

A global market

The environmental effects of products are closely linked to the global market, in which raw materials, products and services are constantly being traded in more or less open economies. The framework for special environmental efforts aimed at products is thus essentially different to the

framework within which existing environmental initiatives have been developed.

Products

The product-orientated approach is based on the premise that the overall environmental impact can only be understood - and efforts properly prioritised - by considering products throughout their entire life-cycle from cradle to grave. The existing product-orientated initiatives have mainly involved development of tools for analysing and evaluating the environmental impact of products and developing instruments to promote sales of less environmentally degrading products. In addition, efforts have embraced special initiatives that have proved capable of enhancing the environmental properties of selected products. Efforts have also been directed at individual, selected parts of product life-cycles with a view to solving specific environmental problems. Among other things, work has been done on developing less polluting production and on attempting to remove particularly hazardous substances from the products.

Product-orientated environmental initiative

The intensified product initiative is not intended to replace the existing environmental initiatives but rather to supplement them in fields in which such efforts have not been sufficient to solve the problems and in which the product approach may be expected to have more clout.

The environmental challenge

This proposal for intensifying product-orientated environmental initiatives is based on a reduction of the environmental impact caused by our present standard of living and current consumption. Hence, the proposal does not concern questions on reducing the standard of living and the overall size of products consumed - but it is indeed no obstacle to any such reduction, of course. Under any circumstances, there is a need for products that are less resource consuming and have considerably improved environmental properties than those already on the market. The proposal is also based on the existing objectives for the development of the environmental impact.

The environmental challenge

The environmental challenge is to help ensure that national and global affluence develop in such a way that resource consumption and the environmental impact from the production, use and disposal of products are reduced to a sustainable level.

2.4 Basic prerequisites for a product-orientated initiative

Openings for Danish trade and industry

For the Danish business community, the global environmental trend affords a series of opportunities and openings. Increased global prosperity will generate a constantly increasing demand for goods and services, and

product development will come under constantly increasing pressure to create products with considerably improved environmental properties.

Greater environmental problems create a greater demand for environmentally sound products

This trend will develop as the gravity of the environmental problems becomes more obvious and more visible everywhere. Today, it is, however, not possible to predict very precisely how trends will evolve for any particular markets - geographically, technologically or product-wise. For individual companies, one very important aspect of this trend will be the ability to keep globally informed and to supply the right product on the right market at the right time.

Among other things, a demand can be expected to arise for products not containing or produced with the aid of environmentally or health hazardous substances, products that are entirely recyclable or products with lower energy consumption.

Other countries are intensifying their product-orientated environmental initiatives

In countries like Germany, Sweden and the Netherlands, work has been going on for some time now to intensify product-orientated environmental initiatives. Both these and a number of other western countries are seeing mounting interest in products with improved environmental properties. Danish companies have good opportunities for "getting a slice of the action" in an international market for products with improved environmental properties but this trend will not evolve of its own accord.

Danish companies do have the potential, though individually only very few have adequate resources and environmental know-how to see through such initiatives alone. Developmental initiatives are therefore needed in close co-operation between the authorities, the companies and their organisations.

Development not only gives Danish companies *opportunities*; it is actually *crucial* that Denmark remains an effective stakeholder on the international market, with plenty of sound and competitive companies if the product-orientated environmental initiative is to be consolidated.

The commercial prerequisite

The commercial prerequisite for a product-orientated environmental initiative is that such action should be instrumental in restructuring both the national and the international market to the production and sale of products with improved environmental properties while retaining or improving the international competitiveness of Danish trade and industry.

Change to a sustainable production and consumption pattern also depends on the understanding and active involvement of all groups of society. Consumers must, for instance, choose less environmentally degrad-

ing goods or other solutions to their requirements, companies must develop and market products with environmentally improved properties and dealers must include these products in their range. These efforts are only possible if they are not conflicting with the interests of the individual stakeholder. To this can be added that interaction must be created between rich and poor countries so as to support the potential of the poor countries for producing cleaner products.

All stakeholders must be involved

It is thus a prerequisite for a product-orientated environmental initiative that the effort, both nationally and globally, enables the stakeholder to lend their support and involvement to ensuring the production and use of less environmentally degrading products - while at the same time protecting their own interests.

3 Product-orientated environmental initiative - the process and goals

3.1 Introduction

Chapter structure

This chapter describes the Danish EPA's proposal for a process to sharpen the focus on the product-orientated approach to environmental problems - including possible short-term expectations from intensified product initiatives.

This proposal is basically structured along the same lines as the proposal for the continuing process. This correlation is also described below.

Overall objectives

The proposal for intensifying the product-orientated environmental initiative takes as its starting point the challenges outlined in the preceding chapter, as well as a series of proposals for overall objectives. The overall objective proposals are described at the end of the chapter.

3.2 Product initiatives as a process and a dialogue

The idea is to supplement the source, medium and chemical-orientated approaches to environmental efforts with a fourth and more general product approach. This suggestion for intensifying product efforts is a proposal for an *incipient* all-round initiative.

Setting the process in motion

The concrete initiatives, which will be suggested, are far from being sufficient to achieve the overall environmental goals. First and foremost, the ambition is to set in motion a process capable of inciting stakeholders to start changing their course.

The results of such efforts will depend on changes in many areas involving many stakeholders. It must therefore be expected to take years before the results manifest themselves in the form of established markets for less environmentally degrading products.

On the basis of i.a. the experience gained from the introduction of organic foods, it is judged that the proposed efforts will contribute to establishing new markets for less environmentally degrading products within a number of product groups within a period of approximately five years.

First results within a couple of years

The first results of the initiative, however, are expected to be recordable within just a couple of years, behavioural modifications becoming visible among a number of essential stakeholders in the form of increased production, supply and marketing of a number of less environmentally degrading products. This will reduce the environmental impact and resource consumption but any change to the state of the environment will not likely be recordable.

Proposal for a dialogue

The product initiative is a process based on acknowledging the usefulness and necessity of very actively involving the stakeholders concerned in developing the initiative. Both goals and analyses as well as proposals for specific initiatives should be discussed and adapted in the ongoing work. The dialogue and process involved in developing more environmentally sound products are not just means of achieving the product-orientated environmental initiative - to a great extent, the dialogue *is* the product-orientated environmental initiative.

The proposed process is cyclical, passing through the same phases at regular intervals and starting each new phase from the results currently achieved.

A repetitive process in five phases

As suggested in the drawing below, the product-orientated environmental initiative is operated in five phases: outlining of goals, analysis of framework and conditions, concrete proposals for initiatives, implementation and evaluation.

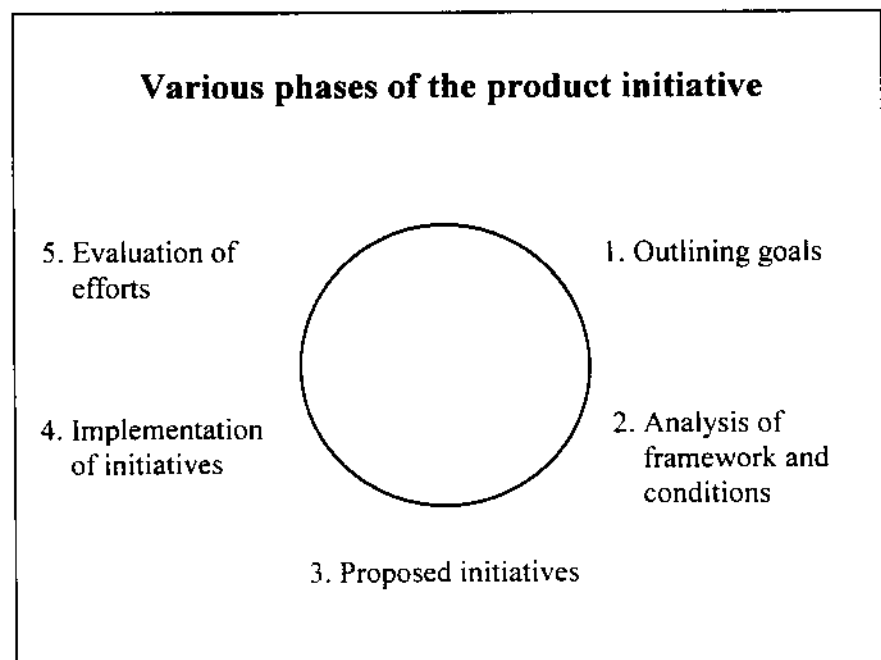


Figure 3.1
The various phases of the product initiative

Phase 1

1. Outlining of goals. First, both environmental and other goals should be laid down for the product initiative.

In Section 3.3, a series of overall goals are proposed.

Phase 2

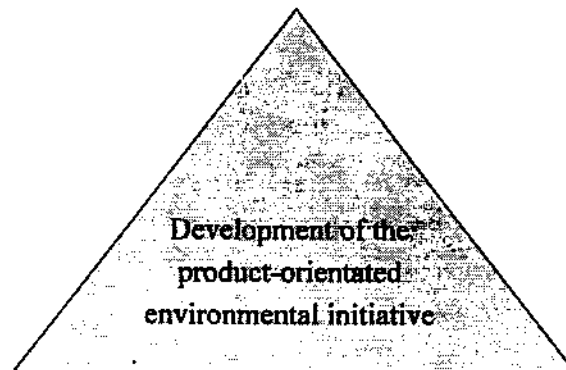
2. Analysis of framework and conditions. A product-orientated environmental initiative must, of necessity, be based on the complex interaction between products, stakeholders and market. It is therefore central to analyse the framework and conditions for the product initiative on the specific basis of the products, the market and the stakeholders. These three points of view are evaluated together in order to cover an essential part of the general conditions for the initiative.

Chapter 4 analyses the conditions and framework for products. The product perspective is intended to shed light on the products at which the product initiative is targeted. What environmental properties and other aspects of the individual product should be improved? What are the possibilities of enhancing the environmental properties of the products?.

Product initiative conditions

The product perspective is designed to ensure:

- *that products are developed which have a smaller content and emission of environmentally and health hazardous substances, reduced energy consumption, and a smaller content and consumption of renewable and non-renewable resources.*



The market perspective is designed to ensure:

- *that products are developed and marketed which can compete on price, function, quality and the environment*

The stakeholder perspective is designed to ensure:

- *that each individual group of stakeholders can and will contribute to a reduction of the environmental impact of the products.*

Figure 3.2
The triangle of conditions

Chapter 5 analyses the conditions and framework for the market. The market perspective is intended to shed light on the conditions governing the production and marketing of less environmentally degrading products on the national and international market. What are the possibilities of influencing those conditions, taking into account the competitive situation of the Danish companies, and the agreements that Denmark has entered into?

Chapter 6 analyses the conditions and framework for the stakeholders. The stakeholder perspective is intended to illustrate which stakeholders are mainly influencing the development and marketing of less environmentally degrading products? What are the conditions on which they are willing and able to use that influence to reduce the overall environmental impact from products? What are the possibilities of improving these conditions?

Phase 3

3. Proposal for specific initiatives. Taking this analysis as a basis, some of the areas will be singled out in which intensified or new efforts may help to realise the goals laid down.

Some of the proposals for specific product initiatives are cross-cutting initiatives that broadly may be capable of achieving the conditions for products with improved environmental properties; others are for initiatives aimed at specific product areas that can bring about concrete results and experience in delimited areas. The proposal contains suggestions for both the content and the organisation of such initiatives as well as both existing and new initiatives.

Chapter 7 examines a series of proposals for specific initiatives which may intensify the product initiative.

Phase 4

4. Implementation of initiatives. Many of the initiatives will directly involve one or more stakeholders.

Phase 5

5. Evaluation and adaptation. The product initiative should be an ongoing process as it is being implemented in a society that is developing rapidly, and in some areas dramatically. The process should therefore be repeated at regular intervals. An evaluation must be made of current efforts and a review made of the process that leads to the adaptation of ongoing initiatives as well as the initiation of new initiatives.

The basis of the product initiative proposal

Material on which the analysis has been based

The Danish EPA's proposal for an intensified product initiative is based on contributions from round-table discussions with a number of important stakeholders, discussions with environmental authorities in the Netherlands, Germany, Sweden and the European Commission, and the existing experience with product-orientated efforts in Denmark. In addition, the Danish Ministry for Business and Industry's work in the resource area and the Danish Government's 1995 report, Denmark's Nature and Environment Policy, have been taken as a basis.

The round-table discussions conducted were attended by representatives of the Confederation of Danish Industries and parties representing consumers and the retail trade, the financial sector, employees and the green organisations, as well as municipalities, counties and a number of sectorial ministries.

3.3 Overall goals for product initiative

Environmental, commercial and process goals

It is proposed that environmental goals as well as commercial and process goals are laid down. Therefore, a characteristic feature of the product initiative proposal is that it is based on various interdependent goals for the environment, industry and the stakeholders.

Despite being an environmental initiative, commercial and industrial goals are crucial as the assumption is that more environmentally sound products will only be developed and sold if the policy fits in with economic interests of companies and the interests of the other stakeholders - if not on the short view, at any rate perhaps on the slightly longer view.

The overall goals are examined in Table 3.1 below.

Table 3.1
Overall goals

Area	Objective
Environmental goals	<p>To contribute to the development, production and marketing of products with improved environmental properties so as to reduce the overall impact from the production, use and disposal of products.</p> <p>To limit the spread of environmentally or health-hazardous substances, the increasing use of fossil fuels, the overexploitation of biological resources and the consumption of non-renewable mineral resources.</p>
Commercial goals	<p>To strengthen the competitiveness of Danish trade and industry by generating a basis for the development, production and sale of products with improved environmental properties.</p>
Process goals	<p>To involve all relevant stakeholders in realising the environmental and commercial goals.</p> <p>To influence our international business partners to take similar initiatives.</p>

4 The products

4.1 Introduction

Based on the environmental properties of products, an analysis is presented below of framework and conditions for the development and marketing of, and the demand for, less environmentally degrading products.

The consumption of products in Denmark has grown enormously during the past 20-30 years, and with it also the quantity of resources, chemical substances and other items used in the production and use of products.

Conclusions about the products

The analysis of the products resulted i.a. in the below list of conclusions:

- A large number of and among themselves very different products are involved.
- The environmental problems can be linked to all parts of the life-cycle of these products.
- Tools for determining the life-cycle impact of the products are almost ready but there is a lack of smallholder models.
- Given the number of products, there is a need to develop broad-based instruments targeted at product areas, types of environmental properties, etc.
- Identification work needs to be continued on the product, substance and material areas with the greatest need and potential for a positive outcome of initiatives.
- A much extended collection and quality assurance of data on the environmental properties of the products is generally needed.
- There is a need for development of tools for identifying alternative, less environmentally degrading solutions in the development work.
- It must be possible to take into account various product characteristics besides their environmental properties - including price, functionality, working environment properties, aesthetic qualities, etc.

Background to the analysis

The analysis in this chapter is based on experience gained in the environmental administrations, at companies and in the research and consultancy area over the past 5-10 years, during which the environmental properties of the products have been investigated.

Chapter structure

First, the chapter contains a description of the products covered by the initiative. The implications of the environmental impact of a product are then reviewed from a life-cycle perspective, together with ways of evaluating this impact. A number of examples illustrate how know-how on the environmental properties of products should be generated and used by the relevant stakeholders, as well as they illustrate the environmental improvements that product initiatives may entail. Finally, some deliberations are presented on the competitive features of environmentally improved products.

4.2 Products covered by the product initiative

Focus on all products

As a basic principle, the product-orientated environmental initiative should be targeted at all products manufactured and consumed in Denmark. In an open economy with extensive imports and exports of goods and services, this means that the spotlight must be on products made in Denmark, of which some are exported, as well as on products that are imported and used in Denmark.

Basically, the product initiative is targeted at physical products causing major environmental impact from a life-cycle perspective. Services are also included if they entail major consumption of physical products of importance to the environment. Cleaning and transport, for instance, are services relevant to the product initiative while marriage counselling is not. Given their turnover volume and environmental impact, foods are also essential to the product initiative while works of art will only be so as an exception.

Furthermore, the products include both products used by the end user, the so-called end products, and semimanufactures used in their production.

A huge number of products

The number of products on the Danish market is vast. Foreign affairs statistics record trade in approx. 15,000 different product groups. Each of these comprises a great many different articles. To these must be added the services. This diversity of products is emphasised by the fact that the product initiative is directed not only at products existing on the market today, but, in particular, at the products that will be developed and marketed in future years.

Short product life

The commercial life of new products has become increasingly shorter in recent years, and one generation of products is superseding the next at an ever increasing rate. This is positive in the sense that they enable new, less environmentally degrading products to penetrate the market more quickly but it increases the complexity of the product field at which any product initiative should be aimed.

Amid this multiplicity of products, initiatives must, as mentioned, be directed at those product groups causing the heaviest impact on the environment, and where such initiatives have a reasonable chance of bearing fruit. The possible success of such initiatives depends, i.a., on the market on which the products are traded, and on the stakeholders and instruments that can be activated in order to change the environmental impact of the products.

4.3 Environmental properties of products in a life-cycle perspective

The influence of the products on the environment depends on the environmental properties of the individual product and on the size of consumption. Environmental properties are comprised by the overall environmental impact associated with the entire life-cycle of the product (see Box 4.1). These properties can be mapped by use of a so-called life-cycle assessment (LCA).

The life-cycle perspective

There can be great differences in the significance of the various stages of the life-cycle of a product for the overall environmental impact of that product. Therefore, in the life-cycle perspective, it is different stakeholders that can make special efforts to improve the various environmental properties of the product.

For many products, it will be the choice of design in particular that determines a number of the environmental properties of the product - this applies, for example, to raw materials, production processes, function mechanisms, consumption during the utilisation phase and the scope for separating or stripping the products after use. In his or her choice of consumption and the subsequent use and disposal of the product, the consumer also has a decisive influence on the overall impact during the product life-cycle.

Need for extensive insight

As appears from the box, the environmental properties of a product are a highly complex parameter. Precise determination of the environmental properties of a product requires extensive insight - both all-round special-

ist insight and a knowledge of the life-cycle conditions of the specific product. Parts of this knowledge will normally be spread over different stakeholders involved in the product life-cycle. One of the challenges facing product-orientated environmental initiatives is to make that knowledge available in all relevant contexts.

Environmental properties in a life-cycle perspective

Box 4.1

Environmental properties in a life-cycle perspective

Much simplified, the environmental impact of products - goods and services alike - throughout their life-cycle is divided into the following stages:

Energy and raw material extraction

Includes extraction and any working-up of the raw materials used for making the product. Extraction gives rise to depletion of resources and pollution in connection with the actual extraction process.

Production

Includes all processes leading up to the final product and final service, i.a. the use of energy, water and other ancillary substances in the production process, emissions of environmentally degrading substances and the generation of waste.

Distribution

Conveys the final product to the end user, consuming i.a. energy and causing the emission of various environmentally degrading substances.

Use

Product use can range from a few seconds to many years. Products with a long life often require the use of resources such as energy and water and the application of various chemical substances like cleaning agents in connection with use and maintenance. Thus, use can also give rise to the emission of various environmentally degrading substances.

The longer its life, the more years over which to spread the environmental impact of manufacturing and disposal of the article. If the environmental impact caused by using the product is the central element, manufacturing and disposal are of less significance.

Disposal

After use, products are either reused, incinerated or dumped. Recycling and incineration ensure that parts of the material and/or energy content of the products are utilised once more. All three kinds of disposal give rise to emissions of environmentally degrading substances to varying degrees. In addition, dumping requires special sites.

Lack of life-cycle assessment data

In many cases, the source data for LCAs are generally characterised by substantial uncertainties and deficiencies. This is especially true of information about the effects that can be caused by the use and spread of chemical substances. It is equally true of information on the environ-

mental impact of the many different processes, raw materials and materials used in the manufacture, use and disposal of products. There are also problems in operationalising an important area of action such as the preservation of biodiversity. The inventory of environmental properties of products is one of the initial elements of LCAs, which are treated in the next section.

4.4 Evaluating environmental properties of products

The vast majority of products can cause several different environmental problems. For this reason, it is rarely possible to immediately identify the - *in overall terms* - most important areas of action. That applies whether one is a manufacturer, dealer, authority, or a professional or private consumer. In addition to these data, there is thus a need for usable methods of comparison as well.

*Methods for both
professionals and others*

Professionals must have both methods and tools as those described below, and tools need to be developed that can help make life-cycle considerations possible on the basis of the information available. This is exemplified at the end of this section.

Environmental assessment of products from cradle to grave started on a small scale, 25-30 years ago. Since the early 1990s, there has been an increasing focus on developing the methodological foundation in the field. The Society of Environmental Toxicology and Chemistry (SETAC) has been very active in this field throughout this period but still needs to operationalise its underlying methods for a number of the stages in their code of practice for LCAs.

ISO standard for LCAs

Since 1993, the International Organization for Standardization (ISO) has been developing standards for methods in this field. Before long, an ISO framework standard for LCA will probably be adopted, stipulating what an LCA must include in general terms (ISO 14040). Under this framework standard, three more detailed standards will be established for the ongoing parts of an LCA. Here, the inventory is equivalent to a life-cycle assessments, and the environmental assessment includes a number of activities enabling the different potential environmental properties of products to be balanced against each other following a fixed pattern.

- Goal definition/scope and inventory analysis (ISO 14041)
- Impact assessment (ISO 14042)
- Improvement assessment (ISO 14043)

The framework standard paves the way for the possibility of omitting the environmental assessment, so that the interpretation of LCA results is based solely on a separate inventory of the various contributions such as material consumption, energy consumption, emissions and waste.

The elaboration of ISO 14041 is currently being finalised and work on ISO 14043 is well under way. The drafting work on the impact assessment standard (ISO 14042) includes two difficult stages with regard to the last part of the impact assessment, on which no clarification has yet been obtained. One is the question of "normalisation" - i.e. whether, and if so how, estimated contributions to environmental effects and resource consumption should be related to overall impact and consumption. The other is the question of "weighting" - i.e. how the contributions to each of the effects and consumptions of individual resources are weighted relative to one another.

The outcome will probably be that the impact assessment standard leaves the user with a number of choices by providing instructions on different possible approaches to these steps.

ISO eco-labelling standard

ISO is also in the process of developing eco-labelling standards (the 14020 series). This will include a framework standard for eco-labelling and three underlying standards.

- Single-criterion labels, relating to a single aspect only, and multi-criteria labels like the EU eco-label.
- Self-declaration of environmental properties.
- Environmental product declarations with verification.

Discussions of standards

In connection with the standards for LCAs, discussions particularly revolve around the question of whether or not to include the total life-cycle of products and the question of how to evaluate the estimated effects in relation to one another. At the same time, this is of great importance to the potential of the standards. With regard to the eco-labelling standards, there are discussions as to who should be represented and what degree of consensus should be achieved in the laying-down of criteria.

EDIP - a Danish environmental assessment method

A current Danish example of an environmental assessment method for products has been developed in connection with the large EDIP^{*} project, reported on in the spring of 1996 /3/. In general, the EDIP method is more detailed and has, in advance, made and justified more choices than are being proposed in the standards described above.

^{*} EDIP: Environmental Design of Industrial Products (Danish abbreviation: **UMIP**)

The EDIP method stipulates that environmental properties and resource consumption must be normalised so that they can be expressed in percentages of the annual impact from an average person - either in Denmark, if a local or regional effect is considered, or world-wide, if the effect is global.

The following weighting of the various environmental problems is based on Danish - politically adopted - objectives for reducing various kinds of environmental impact. In the case of non-renewable resources, the weighting is based on the known supply horizon.

The EDIP method forms part of a package tool which also includes guidelines on environmentally sound design, a database and a PC program that will be available in 1997. The package tool ensures that environmental considerations are included in the design of products. The tool has been developed in relation to - and has so far been applied to - five different products within the field of electromechanics. But the method and the database may also be used for environmental assessments of products in other contexts and for other purposes.

Knowledge of the environmental properties of products is relevant to all stakeholders involved throughout the product life-cycle. If this knowledge is not generated and disseminated, there is no basis on which to act. This topic is examined below. Here, it will be sufficient merely to present a number of examples of cases in which evaluations of the environmental properties of products are relevant to different stakeholders and examples of the knowledge that we in Denmark have in the field today.

In not nearly all cases, the use of such a relatively complicated environmental assessment method such as the EDIP method will be a feasible prospect though it will usually be possible to base the product evaluations on the same principles or on parts of the method.

Box 4.2

Generating and applying knowledge on the environmental properties of products

Purpose and stakeholder	Examples of generating and applying knowledge on the environmental properties of products
The involvement of the authorities in designating environmentally significant product areas.	<ul style="list-style-type: none"> - Ranking industrial products in Denmark. - Mapping out essential product areas for public procurement. - Mapping out the environmental impact of the family. - Mapping out environmentally significant products in selected trades.
The involvement of the authorities in designating less environmentally degrading products or the most significant environmental properties of products.	<ul style="list-style-type: none"> - Comparing different types of beverage packaging/containers - Comparing waste treatment methods for specific products and waste fractions. - Eco-labelling criteria, environmental product declarations and purchasing guidelines.
The development of the companies of less environmentally degrading products.	<ul style="list-style-type: none"> - The EDIP method or assessment methods based on the methods and principles therein.
Promotion of the demand for less environmentally degrading products and helping to identify important environmental properties.	<ul style="list-style-type: none"> - Eco-labelled products, environmental product declarations and purchasing guidelines.
Promotion of supply of less environmentally degrading goods from the retail and wholesale trades	<ul style="list-style-type: none"> - Eco-labelled products, environmental product declarations and purchasing guidelines.

Main products from an energy and resource angle

On the basis of energy consumption and resource losses, an examination of industrial products in Denmark allocates top priority to products within the sectors of transport, agriculture and food, construction and textiles when the products are considered throughout their entire life cycle /4/. What now needs to be investigated is whether the priority-setting method employed can be expanded to include the content of the products of environmentally or health hazardous chemical substances.

The environmental impact of the family in a life-cycle perspective

Similarly, a survey of the environmental impact of a family's activities points out meals, transportation and residential heating as the most environmentally significant activities /5/. Each activity includes several product groups and resource consumption.

Public consumption

Public-sector consumption of products has been surveyed in various reports /6/. The purpose has been designate to product groups in which public procurement constitutes a substantial part of the market.

4.5 The potential of environmental improvements of products

No sense in specific goals

There are enormous variations in the dimensions of the relative or absolute environmental improvement that has been achieved through the current environmentally improved products familiar to us. Nor is there any sense in trying to draw up a specific goal for environmental improvements of products on the Danish market. The products vary far too much for that, and our knowledge of both the technical and the economic conditions needed to reduce the environmental impact of the products is much too insufficient.

Reductions in energy and resource consumption and in emissions of xenobiotics can be achieved by economising and using known or adapted technologies. Extra insulation on refrigerators or electronic control of the energy or water consumed by products are examples of this.

Technological leaps often needed

More radical changes in energy and resource consumption will often require actual leaps in technology, solving a task or fulfilling a need in an entirely new way. The use of information technology, semiconductor technology or enzymes in new contexts exemplifies this.

When the consumption of environmentally or health hazardous substances is concerned, there is no immediately visible limit to the improvements that are possible. Even today, many substances may be replaced by other environmentally acceptable substances or functions. Nor is there any reason to believe that such possibilities will be exhausted for the time being.

Tools cannot suggest alternatives

There are only a few tools today that can help the designer by indicating alternative solutions that are better for the environment. The EDIP method can compare solutions but cannot suggest alternatives. The Rentek database /7/ and the Danish EPA's reference lists for cleaner technology are examples of aids for identifying cleaner technology alternatives in the manufacturing phase. SUBTEC /8/ is a database tool for hazard assessment of products and for solvent substitution. Generally, though, there can be said to be a great need for developing design aids capable of actively suggesting alternative less environmentally degrading solutions.

4.6 Environmental properties are not absolutely all

Products are used for fulfilling a function or a particular need. Any initiative geared towards a product or product group must be based on the precondition that the need to be fulfilled can be fulfilled in a way that is environmentally and socially more ideal.

There will be different understandings of the function of a product or the alternative ways in which a need can be satisfied. As a rule, the manufacturer of a product will look at changes within his product field while a private consumer has far more wide-sweeping possibilities of choosing between basically different ways of fulfilling, e.g., an entertainment function.

Function and quality must be preserved when improving environmental properties

An environmentally improved fulfilment of a given need presupposes that the need is still fulfilled satisfactorily while reducing the environmental impact.

This is also a logical prerequisite if products are to be able to compete on a market on which products are bought primarily to fulfil a need, and, only secondarily, other factors such as environmental and working environment properties will be examined.

It is important, then, for product initiatives to contribute to the development of a practice in which all relevant stakeholders in all relevant decision-making situations simultaneously take into account:

- the environmental properties of the products
- the quality of the products, including functionality
- the competitiveness of the products (price)
- the importance of the products for the working environment
- the importance of the products for other social considerations.

5 The market

5.1 Introduction

Product initiatives are aimed at products that can be subjected to sales on a market. In order to achieve the environmental objective of such initiatives, products with improved environmental properties must be sold in sufficiently large quantities to genuinely influence the overall environmental impact.

At the same time, earnings from these products must be capable of forming the basis for developing even better products and launching them on the market. Moreover, it is a basic condition for any product initiative that Danish policy is to avoid protectionism within trade and commerce, just as international agreements, to which we have acceded, must, of course, be respected.

Can conditions and framework be influenced?

Therefore, it is relevant to assess the conditions and framework for selling products with improved environmental properties on the Danish and international markets. What are the options for influencing these conditions when based on the fact that the Danish market is a small one in open contact with the surrounding world? What are the options when based on the fact that Denmark is party to an international agreement system that makes it possible for Denmark to influence international trade frameworks while, at the same time, it restricts Denmark's possibilities of acting on its own initiative?

Conclusions about the market

The analysis of the market shows as follows:

- Products with improved environmental properties must be able to compete on an international market.
- On this market, there is intense competition on both price and quality - and, to a limited extent, with the environment as a quality parameter.
- If the product-orientated environmental initiative is to succeed, the emphasis must be on improving the competitive situation for products with improved environmental properties. This must not place a unilateral strain on Danish companies in relation to their foreign competitors.

- From a market angle, there are prospects in an offensive Danish product-orientated environmental initiative. This is due to three factors in particular: The Danish market is interesting as a domestic market for small and medium-size companies; Denmark is regarded as a pioneer country when it comes to environmental regulation; and Denmark is seen as an interesting test market by a number of large and foreign companies.
- A market for environmentally sound products is conditional on easy access to knowledge about the environmental properties of the products.
- The public market only demands environmentally sound products to a limited degree.
- The international trade and environment agreements signed by Denmark provide an opening for an offensive Danish product-orientated environmental initiative. This initiative may be targeted directly at the Danish market as well as at influencing these agreements.

The background to the analysis

The conditions and competitiveness of the Danish companies have been the object of thorough treatment in the resource area analyses conducted by the Danish Ministry for Business and Industry in 1992-93 and in the 1994 follow-up. This chapter is based on the understanding of the market that has been built up as a result of this work. In addition - as described in Chapter 3 - the dialogue conducted with the stakeholders during the preparation of this proposal and experience from Sweden, the Netherlands, Germany and the European Commission have been taken as a basis.

As the presentation contains a simplified, overall description of some general conditions, it will need to be expanded and adjusted in the further dialogue with the stakeholders, just as it will need to be concretised in relation to the submarkets on which the individual stakeholders operate.

Chapter structure

This chapter first contains a description of the environment as a competitive parameter, then describes the global market very briefly. It evaluates if and how the Danish market can form a basis of a product initiative, after which the importance of public efforts is examined. Finally, the significance of international agreements on trade and the environment is assessed.

5.2 The environment as a competitive parameter

Products with improved environmental properties will have to be sold on a global market while competing with products offering inferior environmental properties. The main competitive parameters on the global markets are generally price and quality.

Access to information

Quality includes a number of dimensions, the most important one normally being to satisfy the need which the product is intended to meet. Price competition is so keen that it will normally not make economic sense to endow products with qualities which the customers do not appreciate or which are not stipulated by some kind of control. Therefore, environmental properties can only be of importance as a competitive parameter if customers have access to information on such properties and attach importance to them as a quality of the product.

Experience with eco- and energy labelling

Only limited Danish experience is available on customers' reactions to eco- and energy labelling. Within the EU, labelling is compulsory of the energy consumed when operating some kitchen hardware, etc. This labelling includes a division into seven of products according to their energy consumption. This labelling has produced a marked change in the sale of kitchen hardware to machines consuming less energy.

Correspondingly, Swedish experience shows that products labelled with the Nordic eco-label, the Swan, have enjoyed an increase in demand.

When it comes to organic foods, Denmark has for a long time had state-controlled labelling. The experience from selling organic goods is that sales were very low to begin with and only for a small group as the price of organic goods was markedly higher. It was only when the Danish Co-op (FDB) made organic goods available to a wide market, at the same time ensuring that prices were only 10-20% higher than for non-organic goods, that sales rose markedly.

Know-how lacking

Generally, however, only little is known about the way in which the improved environmental properties of products currently function as a competitive parameter. For the main part of the business sector, the use of the environmental properties of products as a competitive parameter is relatively new, and very few references exist from which to draw general conclusions. The following evaluations are therefore anchored essentially in the dialogue with the stakeholders and in the Danish EPA's own experience.

Consumers' attitudes and efforts

Different surveys of consumers' attitudes towards less environmentally degrading goods show that a fair share of consumers are happy, as a basic

principle, to show consideration for the environment (close to 75%). At the same time, the actual proportion of less environmentally degrading products sold shows that fewer consumers than that actually buy these products.

There are a number of prerequisites for doing so. First, the more environmentally sound goods must be available on the shelves - and here the retail trade has a major responsibility. Secondly, there must be easy access to simple information - especially at the shops where the shopping is done. Thirdly, there must be a sensible price level for green products. A common problem with sales of environmentally sound products is that usually they are considerably more expensive than the alternatives.

Feeble public efforts

The efforts made to promote environmental and energy considerations in open-tender contracts and public procurement /9/ are not yet perceptible on the market. Partly, there have been some very marked examples of large investments where no consideration was given to the environment when purchasing, and partly it is still the exception rather than the rule that environmental requirements are stipulated in public procurement or that companies are winning public orders directly by virtue of improved environmental properties. However, there are also examples of pioneering public enterprises such as the Danish State Railways (DSB) and the Danish armed forces as well as a few local authorities.

Some companies have started

Growing interest in the environmental properties of products is being observed from large international trading companies and individual manufacturers within industries, e.g. the textile and furniture trades. This can also be seen from the interest in environmental control, environmental management, green accounting, environmental management system (EMAS) approvals, etc.

Interest in environmental matters

Developmental expectations

Looking at the interest in the environmental conditions in the broad sense, it varies considerably over time. Denmark saw growing interest in the environment through the eighties, followed by stabilisation at a comparatively high level in the nineties. Interest in especially the environmental properties of products has begun to manifest itself in the nineties and is particularly marked with regard to energy consumption, health and ecology. However, only a very limited part of the total product offering has yet felt the effect of this interest.

In the Netherlands, interest in environmental conditions rose to a very high level through the eighties, subsequently flagging somewhat during the first half of the nineties /10/.

Greater environmental problems - greater sales of environmentally sound products

On the slightly longer view, increasingly comprehensive global and local environmental problems will result in environmental effects and their economic consequences becoming more visible to all the stakeholders - including the consumers. Therefore, the importance of environmental properties as a competitive parameter must be expected to eventually increase distinctly although the rate, at which this will happen, can only be predicted to a very limited extent. In other words, environmental properties will, in all probability and to an ever greater extent, be a basic objective for the innovations of the companies.

Presumably, this interest in the environment will initially impact areas, in which very distinct environmental effects can be felt, and on prosperous markets with the reserves to allow for political or ethical considerations. The latter is interesting from a Danish point of view, as the majority of Danish goods and services are sold on developed markets in prosperous countries, see Table 5.1.

5.3 The global market

Wide-ranging competition

At global level, increasing access to information and fast transportation to virtually all parts of the world mean that the world market can to some extent be considered one big contiguous market. This globalisation of the market creates keen and increasing competition for the individual company, which in principle is competing with all companies world-wide within its particular product area.

Trading with industrialised countries

Denmark is firmly integrated in the international market, exporting approx. 60% of Danish goods production and importing approx. 60% of the goods sold on the Danish market. Table 5.1 shows imports and sales of Danish products broken down into different markets. A very sizeable part of trade is conducted with other highly industrialised countries, particularly within the EU. I.e., markets that, in many ways, resemble the Danish market.

Table 5.1
Foreign trade broken down into countries

Trade in DKK billions	Exports from Denmark	Imports to Denmark
Europe, total	207	190
EU countries	170	162
America, total	19	18
Of this, North America	13	14
Asia, total	30	21
Of this, Japan	11	6
Africa, total	5	2
Oceania, total	2	1
Total	264	232

Source: 1995 Statistical Yearbook, Table 361

5.4 The Danish market as a starting point

A small Danish market

The Danish market makes up only around one per thousand of the global market in terms of population. The question is therefore whether it is possible to envisage a product-orientated environmental initiative based on the Danish market - is it possible to create segments for which companies will be interested in developing and supplying with environmentally sound products?

There are a number of reasons why the Danish market is interesting for many Danish as well as some foreign companies when it comes to environmentally sound products.

Domestic market is significant

Most Danish companies are small enough for the domestic market still to be of significance to sales. Even for larger concerns, the Danish market is important as a market they know and as one that is used as a test and reference market for their products.

Statutory requirements interacting with a strong market

There are a number of sectors in which interaction has successfully been created between a high level of service or protection on the one hand and the development of companies being in a strong international position on the other. This applies, for instance, within the health-care sector to products such as hearing aids, insulin, blood analysis machines, etc. It applies within the paint/varnish sector, in which Denmark has been a pioneer country as well as a pioneer market for water-based paint products. And it applies within the production of district heating pipes where Danish companies are world market leaders.

Spin-off effect on regulation in other countries

A number of large foreign companies seem to find the Danish market interesting. First, the development in Danish environmental regulations is regarded with interest. One example is the heavy involvement of the agrochemical industry in Danish pesticide regulation. This interest is presumably due to the fact that regulations in Denmark may be expected to have a spin-off effect on other countries.

Denmark as an international test market

Secondly, the Danish market is considered an interesting test market. This applies to i.a. a number of companies in the electronics and chemical industries. E.g. several German chemical groups have been willing to develop dyes with improved environmental properties for Danish textile enterprises. Again, it must be the expectation that there will be a far greater market for these dyes if the Danish companies can make them work.

International analyses confirm benefits for pioneer markets

Internationally, it has been described in various ways how a high level of protection and large-scale environmental initiative interacts positively with the development of competitiveness of trade and industry. Among others, the OECD has made an empirical macroeconomic analysis corroborating the likelihood of this; the European Commission, in its White Paper on the environment and competitiveness and in a report just sent out by the Commissioner for Industry, Martin Bangeman, has also made a similar evaluation. The American economist Michael Porter /11/ has argued that demanding markets will be instrumental in helping companies which supply such markets, to retain their competitiveness and, on the longer view, improve it relative to companies operating on less demanding markets.

Cost of being a pioneer

It is, however, obviously that extra costs may be involved for companies supplying goods to a pioneer market or manufacturing goods in a pioneer country. Other thing being equal, these costs will strain the competitiveness of the companies - at any rate on the short view. Costs imposed only on products manufactured in Denmark are particularly onerous in this respect. Any product initiative must be aware of these costs so as to try to ensure that no distinction is made between foreign and Danish manufactured products.

Different conditions

Market conditions vary greatly between different product areas and between different parts of the world. When organising the product initiative, it is necessary to examine the conditions of the market segments that should be influenced.

Resource area analyses as a springboard

In this context, the Danish Ministry for Business and Industry's resource area analysis can be used as a springboard. The analysis divides the trade and industry into the following areas: food, consumer goods and leisure, construction/housing, communications, transport/supplies and medical/health. Within each of the six areas identified, there is a communality of basic commercial conditions. These conditions are also essential to the organisation of the product-orientated environmental initiative.

A series of significant differences in the conditions applicable to the areas are described. These relate e.g. to differences in the number of stakeholders, differences in the stakeholders' balance of power, differences in public regulation, differences in investments, etc. The Ministry for Business and Industry's analyses should form the basis of further product initiative work.

5.5 The importance of public efforts

Given sufficient market demand, products with improved environmental properties can be expected to eventually be developed. The vital question is: what possibilities are available to the public sector for assisting at the birth of this development by, e.g., influencing the conditions that determine whether the company can or will respond to changes in market signals and start developing products with improved environmental properties?

Influencing the general framework

In the 1995 trade report /12/, the general strategy for ensuring the competitiveness of Danish companies on the global market is formulated as an effort to ensure a sound, general industrial framework for Danish companies. This framework includes:

- Production factors (e.g. human resources and technological know-how)
- Interaction with other companies (e.g. with suppliers)
- Quality-conscious demand (public and private users)
- Market efficiency (e.g. access to venture capital).

Besides the general framework, it is emphasised that macroeconomic factors (e.g. wage level, low interest, low inflation and stable currency exchange rates) will also be essential for a competitive business community. But it is argued that macroeconomic conditions will be harmo-

nised on the most essential markets on which Danish companies operate, thereby making the general framework the most important area in which nation states can support their business community through public initiatives.

Co-ordinated public efforts

There are a number of public-sector activities that influence this general framework in a way that is important to product initiatives. This applies to public procurement and to those construction projects that are either supported or carried out by the public sector as these may represent a demand for environmental quality-consciousness. It also applies to research institutions, education and the technological service network, which can supply human resources and technological know-how. It applies to tax policies, which can affect demand. Environmental regulations are additional framework conditions which determine behavioural conditions on the market and can either promote or inhibit innovations and a general view of product development work. It is essential that all these activities are carried out in a way that provides a co-ordinated incentive to develop less environmentally degrading products.

5.6 International environment and trade agreements

International agreements in the environmental field and agreements governing the exchange of goods are assuming ever greater importance for environmental initiatives. For one thing, international co-operation provides individual countries with the opportunity to influence transnational environmental conditions; for another, these agreements form frameworks for an independent national environmental policy in some cases.

Legally binding frameworks

A brief description is given below of the legally binding frameworks for product initiatives at global, regional and national level. At the same time, the possibilities of influencing these frameworks are described.

This is a snapshot of the situation as it appears in the second half of 1996. International regulations are under constant development. Initiatives are being elaborated in new areas, adjusting amendments are being made to existing agreements and work is being done to fulfil existing agreements.

Global trade regulations

GATT allows for environmental considerations

The current WTO rules contain only a few proper provisions on environmental conditions. GATT/WTO generally permit interventions aimed at safeguarding environmental interests in one's own country, both for home-produced and for imported goods though they must not discriminate against imported goods, of course.

Whereas the former GATT agreement only allowed product properties to be regulated nationally, the WTO agreement also allows rules to be introduced on production methods and processes under certain conditions. This applies in cases in which the method or process is directly reflected in the properties or quality of the article.

Scientific principles

The WTO includes specific provisions (the SPS Agreement) for the application of such rules as part of "sanitary and phytosanitary measures" - which may include environmental protection measures. Unlike previously, a country now has an actual right to introduce environmental rules, providing they are based on scientific principles and are aimed at the state of the environment in the actual country. Even when, on the face of it, there is insufficient scientific evidence for such rules, they can nevertheless be introduced on the basis of relevant available data. In such cases, a basis must be generated for objectively assessing the risks involved within a reasonable period of time.

Technical barriers to trade

The Agreement on Technical Barriers to Trade (the TBT Agreement) stipulates that national standards should as far as possible be based on corresponding international standards. The agreement does, however, recognise a country's right to establish suitable levels of national protection, individually, for reasons of e.g. health, environment, animals and plant health. The agreement encourages the use of international standards, whenever appropriate, but does not require the level of protection to be lowered as a result of international standardisation.

International standards will assume importance

By virtue of the WTO agreements, international standards - such as ISO - effectively determine how to formulate eco-labelling schemes, how to put environmental stipulations into tenders, etc.

When parties cannot come to terms by negotiating, complaints about infringements of the GATT/WTO agreements can be lodged with the organisation. An expert panel is formed on a case-by-case basis to decide whether there is any breach of agreement. The organisation is not empowered to enforce such decisions, and it is thus left to the countries concerned to find solutions themselves if they do not directly wish to comply with a decision made under the GATT/WTO agreements.

WTO rules of great importance

The WTO rules are of great importance to both national and international environmental initiatives. If the rules are developed towards a *restrictive* interpretation, it will be very difficult to implement any environmental initiative in the product field that goes beyond that which can be agreed in the WTO or in international standardisation negotiations. This applies both in Denmark and in the EU. On the other hand, an *expansive* inter-

pretation affords good opportunities for independent Danish or European environmental initiatives. It is therefore of great importance to support this freedom of action in future revisions of the agreements.

Global environmental regulation

The Montreal Protocol and Basel Convention

There are still only a few examples of global environmental regulation. Relevant examples worth mentioning are the Montreal Protocol on the global phasing-out of substances that deplete the ozone layer, which lays down very precise, binding obligations with regard to reducing and phasing out substances that deplete the ozone layer. In addition, environmental considerations have successfully been incorporated in the Basel Convention, which prohibits the OECD countries to dispose of their hazardous waste by exporting it to developing countries. The ban also applies to the export of hazardous waste for recycling.

POPs and the PIC procedure

The Governing Council of the United Nations Environment Programme (UNEP) made two decisions on chemicals in May 1995. One decision concerns initiatives to restrict the spread of a group of persistent organic pollutants - so-called POPs. Realistic strategies now need to be established for the reduction and/or phasing-out of these substances. In the present proposals, it is recommended that legally binding instruments are used.

The second decision concerns the so-called PIC Procedure, which entails an importing country - especially the developing countries - must give its prior informed consent (PIC) for the industrialised countries to export certain particularly hazardous substances to that country. A motion was passed whereby this information procedure has now been made legally binding. A decision must also be made as to any additional steps that may be necessary in this regard - for instance, whether more hazardous chemical substances are to be included in the global agreement.

The 1992 Rio Conference

The progress of global regulations in fields including e.g. chemical substances is due to the action programme, Agenda 21, adopted at the UN Conference on Environment and Development in Rio de Janeiro in 1992. Although Agenda 21 is not binding in the legal sense, politically and morally it is a powerfully obliging document and functions as a basis for the follow-up currently taking place both in individual countries and in regional and international organisations. More multilateral environmental agreements can be expected to be concluded in future but it is known from experience that new agreements are a long time in the melting pot.

EU regulation

EU regulation is paramount

EU regulation is unparalleled the most important international regulation in connection with a product-orientated environmental initiative. It is of great concrete importance to the level of environmental protection and to the regulations achievable within the area nationally and at EU level. Furthermore, it is important for EU efforts and for the EU's part on the global environmental stage. The discussion here will be confined to the most essential parts of the rules of relevance to the product initiative in order to illustrate the significance of such regulations and to stress the importance of intensive Danish efforts to influence the establishment of such rules.

EU regulation provides a better environment

A study /13/ into the importance of EU regulation for the Danish level of environmental protection has shown that, in the vast majority of cases, regulations have led to improved environmental protection both in Denmark and in the rest of the EU. Denmark has been active in developing such regulations. EU-level initiatives will have far more clout than purely national initiatives. Furthermore, most nationally implemented product-orientated regulations will have to be notified to the European Commission anyway.

The Public Procurement Directive

The EU Public Procurement Directive provides both openings and restrictions for making environmental requirements to public purchasing. According to the Danish Ministry for Business and Industry /14/, the possibilities of making environmental stipulations in accordance with EU tendering rules are as follows:

- If a public purchaser uses the allocation criterion of "financially most advantageous bid" - in contrast to simply the lowest price - he/she has the option of making environmental stipulations alongside a number of other quality requirements. This is particularly true when the environmental stipulations influence the properties required for public procurement purposes.
- There is only limited possibility of making environmental requirements to the manufacturing process unless the process influences the properties of the final product and does not affect the environment in Denmark. However, environmental stipulations can be made of the manufacturing process if such requirements can be derived from EU directives or EU regulations.

Regulating environmentally or health hazardous substances

At EU level, the use of environmentally or health hazardous substances is subject to extensive regulations. Virtually all directives and regulations in these areas have been issued in pursuance of Article 100A of the

Treaty. Consequently, they are predominantly total-harmonisation directives containing security and free-trade clauses. The EU rules are comprehensive and include rules on investigation methods, data requirements, hazard and risk assessments with appurtenant hazard labelling, application restrictions, bans and approval schemes.

Since there are still many substances that have not been regulated, bans or restrictions on use can be introduced nationally for selected substances if the national rules meet the requirements made in Articles 30 to 36 of the EU Treaty. Here, especially Article 36 is important as it opens the possibility of fixing national rules to protect the environment and humans. National proposals for restrictions on use must be notified to the European Commission, which deals with proposals under the rules laid down in the "Single Market Directive", which attaches great importance to the free movement of goods. As a result, there are weighty requirements for documenting the need for national regulations. Among other things, it must be proved that the aim of the intervention cannot be achieved without disrupting the free movement of the goods involved.

The Information Directive

In the product regulation field, the Information Procedure Directive /15/ means that countries must inform one another and the Commission about any national regulation measures that may influence the free movement of goods on the European market. This gives the Commission and the other countries a chance to raise objections if they feel that such regulation conflicts with the spirit and the letter of the Treaty. At the same time, it gives the Commission an opportunity to put regulation of the relevant area on the agenda for EU regulations. Then, national initiatives must await and be tailored to these regulations.

EU eco-labelling

EU eco-labelling regulations include rules for developing criteria for and administrating a life-cycle-based eco-label. Labelling is voluntary, which means that, on payment, companies can apply for permission to use the label in their marketing, provided they can prove that the products comply with the criteria applicable to the product group in question. It has been very difficult to agree on criteria for this label; consequently, criteria for only 11 product groups are currently in force, and the label has been granted to around 40 products, including one Danish one.

Other relevant EU regulations

There are large parts of other EU rules that are relevant to the environmental impact of products. A series of directives such as the Machines Safety Directive, the Toy Safety Directive and the Construction Products Directive have implications for the environmental properties of individual products or product areas. More directives of this nature can be anticipated.

In addition to these, there are a number of directives, regulations etc. which are of indirect significance to product initiatives. This applies to e.g. the Waste Directives, the EIA Directives and the IPPC Directive⁷ on the European environmental approval scheme. which is important for the environmental impact of products during the production phase.

Fifth environmental action programme

The product field has been mentioned in the Commission's proposal for an adjustment to the EU's Fifth Environmental Action Programme. One of the things stated here is that, within the industrial field, frameworks must be developed for an integrated, life-cycle-orientated product policy.

Politically and morally binding

Other international forums

Denmark is also taking part in other international forums engaged in the environment - this applies to e.g. various conventions on sea and air pollution, in which agreements and co-operation programmes are continually being adopted. These decisions are politically and morally - but not legally - binding like the EU rules. They are often worded so as to give countries a greater degree of freedom to make their own choices as to how to comply with these decisions. Of the regional sea conventions, the work of the OSPAR Commission in particular is important as the decisions made here are binding on the member states.

The North Sea Convention

The North Sea Convention contains an agreement to phase out xenobiotics in discharges to the North Sea within the space of a generation. This declaration of intent is expected to be followed up by some kind of binding regulation that to some degree lives up to the declaration of intent. This regulation will be highly significant to product strategy as a good deal of the xenobiotics discharged into the North Sea are conveyed to waste water and natural water currents as diffuse pollution from the use and disposal of industrial products.

The Helsinki and OSPAR Conventions

The Helsinki Convention, covering marine pollution and the protection of the marine environment in the Baltic region, and the Oslo-Paris Convention, covering other marine territories in the EU, both contain binding declarations. The declarations deal with regulations on the use of substances and materials as well as emissions from industry, farming, energy and infrastructural installations. For the product strategy, it is the regulations on use that are particularly relevant. The declarations are minimum declarations that make minimum requirements to national regulations. They do not restrict the signatories' right to make further regulations.

⁷ IPPC: Integrated Pollution Prevention and Control.

International co-operation on standardisation

Plans have been made to harmonise all national product and methodological standards of importance to trading as a prerequisite to implementing the Single Market. Consequently, in the years ahead, somewhere between 9,000 and 12,000 product-related joint European standards will have to be developed - the so-called CEN/CENELEC standards.

Standards mean a lot for product development

Denmark is obliged to introduce the joint European standards developed at the European standardisation organisations CEN or CENELEC as Danish standards. Although the adoption of a standard is voluntary, in principle, the standards have a great impact in real terms. Standards are crucial in determining what requirements can and will be made in practice with regard to product design, project design and purchasing, and are thus of great importance for any product-orientated environmental initiative.

Future EU directives in the product area are expected to be framed as "new approach directives"; as a result, it will be placed with the standardisation organisations to elaborate the directives in detail.

The standardisation work done by the international standardisation organisations ISO and IEC is also essential to European standards as there is a co-operation agreement between the European and the world-wide standardisation organisations. In practice, this means that they are gradually adopting each other's standards. In terms of the WTO, the standards are also of great importance as they are the "language" in which internationally accepted commodity trade requirements can be formulated. Requirements can be made to the environmental or similar properties of goods if such requirements refer to an international standard of relevance to the product.

Danish initiative needed

Standardisation work is therefore an area of basic potential for a large-scale Danish initiative in the years to come. Current experience from this work indicates that there are very fine opportunities for being heard and gaining influence but this will call for stringent prioritisation of the initiative as standardisation work is extremely resource intensive.

National environmental scope

There are two aspects to the question of Danish scope for a product-orientated environmental initiative in consideration of the international agreements. One aspect deals with the possibilities of influencing international environmental and trading conditions through these agreements. The other aspect deals with the question of which national measures Denmark is entitled to implement.

Good scope for influence

The international agreements have consistently led to an increased level of protection, both in Denmark and internationally. At the same time, Denmark has consistently influenced the negotiations in which it has taken part. This does not mean that all agreements and all EU rules live up to the level of protection considered desirable by Denmark. But this forms a good basis for ensuring that continued and intensified international initiatives may form an essential part of any product-orientated environmental initiative.

Limits to our abilities

With regard to what Denmark can do on its own initiative, the scope in the product field - apart from the restrictions deriving from the frameworks governing chemical substances and waste - is generally limited out of regard for the free movement of goods. These restrictions have been defined in both the EU and the WTO. All compulsory measures such as labelling, product taxes etc. must be notified to the EU.

There must be a balance between the environmental problem targeted by an initiative and the damage to the free movement of goods caused by that initiative. This presumably rules out negative labelling of factors that the EU does not consider problematic. Product taxation may presumably be implemented if it is fixed on the basis of measurable product criteria.

Voluntary schemes provide opportunities

Voluntary schemes - e.g. eco-labelling - afford more freedom to act. Denmark can design an eco-labelling scheme of its own or choose to join others. However, if they really do influence consumer buying, and thus become a trade barrier to inferior products, these schemes can also be expected to have to submit to international methodological standards in future. Otherwise, they will presumably be regarded as an unacceptable barrier to trade under the WTO.

Subsidies must comply with EU requirements

Subsidies for product technology development and market introduction will have to comply with the EU requirements governing the subsidy schemes. These frameworks provide good opportunities for appropriate design of the schemes as long as no actual subsidies are granted for operations or investments in major fixed assets.

Totally harmonised EU rules

In areas with totally harmonised EU rules, Danish initiatives must especially concentrate on influencing the work of laying down EU rules - preferably as early on as possible. This applies particularly to regulation of the use of substances and materials.

Nevertheless, it is still possible - within the existing framework - to introduce national rules forbidding or restricting the use of certain hazard-

ous chemical substances. At the same time, though, this makes great demands to the documentation of the necessity of such regulation.

6 The stakeholders

6.1 Introduction

There are a large number of stakeholders who may contribute to the development and sale of products with improved environmental properties. Product initiatives aim to ensure that all these stakeholders are willing and able to reduce the environmental impact of their own activities and are willing and able to influence other stakeholders to reduce their environmental impact.

Co-operation is vital

The co-operation of the stakeholders is vital. The development, marketing and sale of products with improved environmental properties require that all stakeholders contribute with know-how and other resources. Consumption choices must be made and priorities set, pointing in the right direction. These contributions to the initiative can only be expected as voluntary co-operation in promoting efforts. To the greatest extent possible, stakeholders must perceive it as being in their own interest to contribute to the product-orientated environmental initiative - otherwise the initiative will simply fail to achieve the desired effect.

Conclusions about the stakeholders

An analysis of the stakeholders shows as follows:

- A greater focus needs to be brought on three types of stakeholders who have not previously been spotlighted by environmental efforts. These are the consumers, the dealers, and the manufacturers in their role as product developers.
- The motivation, which exists among the population today, must be maintained, qualified and utilised for action. In this context, commitment should focus initially on the part of the consumers who are fundamentally motivated to take action.
- Consumer involvement is conditional on guaranteeing consumers the right and access to credible and adequate information on the environmental properties of products.
- Organisations representing consumers need to be consolidated in order to equip them to offer more powerful opposition to other organisations on the market.

- It is vital to create a range of goods with improved environmental properties in all essential areas and at a price affordable to the ordinary consumer.
- It is crucial for product initiatives to create binding co-operation with the essential stakeholders in the trade sector.
- Trade sector stakeholders must be guaranteed access to any information needed in order to make a positive contribution to product initiatives.
- Work should be done to substantially increase the amount of goods and product groups equipped with official eco-labels. This will make it easier for smaller trading companies to ensure they offer products with sound environmental properties as part of their range.
- The significance of the trade sector for product initiatives should be disseminated to all parts of the sector. All training within the field needs to include an introduction to the environmental aspects and potential inherent in trade sector work.
- Dialogue is needed with the manufacturers of both goods and services in the actual elaboration of product initiatives. This dialogue should involve both the manufacturers' organisations and pioneer companies within the various product fields.
- The manufacturers' constructive involvement in the product initiative must be expected to imply that the development and marketing of products with improved environmental properties are made commercially attractive on the short and medium views. Given the timescale with which small and medium-size companies operate, a long-term payoff is not sufficient.
- Access to know-how on environmental problems and solution options needs to be greatly improved, and the developmental capacity of the companies widely consolidated. It is important to continue the work of developing and, more particularly, disseminating practical tools for the inclusion of environmental considerations in product development.
- An improved knowledge base needs to be built up among environmental administrations regarding manufacturers' conditions for developing products with improved environmental properties. This includes

basic knowledge of environmental impact and product development in the service sector.

- Finally, this chapter also highlights a number of the consequences to the product initiatives of analyses of the knowledge brokers, the financial sector, the counties and municipalities, the public sector and other countries.

Background to the analysis

Stakeholder analysis and descriptions are based on the round-table discussions conducted, the references listed, and other contacts and experience available when drawing up the proposal for a product-orientated environmental initiative.

Chapter structure

This chapter starts with a discussion of some general prerequisites for expecting stakeholders to be willing and able to contribute to product initiatives. It then describes the stakeholders in whom it is particularly essential to take an interest as well as their conditions and possibilities for contributing to product initiatives.

6.2 Prerequisites for product initiative contributions

Today, a great deal of the stakeholders regard environmental efforts as an important social task. The authorities cannot merely view them as passive or reluctant stakeholders that have to be supervised and controlled. They are a medley with independent knowledge and interest in the field of trade and industry and the environment.

Stakeholders' knowledge, resources and interests are fundamental

This does not mean that the other stakeholders always have the same interests or the same knowledge as the authorities. However, it does mean that the authorities' efforts can and must be organised on the basis of an understanding of the stakeholders' knowledge, resources and interests. The authorities must try to stimulate the other stakeholders - by pushing and pulling - in order to get them moving in the necessary direction. Interaction is both collaboration and counteraction.

Powerful interests

Reconverting production and consumption to products with radically improved environmental properties will influence the basic conditions of existence of trade and industry as it will entail changes to basic consumption patterns and choices. And that involves, of course, very powerful interests. The product initiative is based on the precondition that environmental behaviour *must* be changed. The challenge is to develop the necessary and adequate means with which to achieve that aim. These means must be used in collaboration with the stakeholders in order to

achieve the greatest positive effect possible - both environmentally and commercially.

Motivation

Positive motivation

Positive motivation can spring from environmental initiatives being viewed as correct in their own right or can serve other interests to which a value is attached. It can be the belief that it makes it easier to recruit qualified employees or that the market wants and is willing to pay a higher price for more environmentally sound products. An instance of negative motivation is the wish to avoid being penalised.

Disincentives

It works as a disincentive if environmental efforts are considered unethical - e.g. in connection with violent actions - or if it clashes with interests to which the stakeholder attaches value. This may be, e.g., the expectation that the market will not pay the extra cost of the environmentally sound product. It may be the perception that there is cheating going on whereby others are achieving gains in the environmental field to which they are not entitled by their conduct. Or it may be an awareness that the stakeholder is having a harder time meeting environmental requirements than competitors because the environment as a parameter is not the stakeholder's particular forte.

Positive attitudes - negative in terms of economy and competition

The manifestations during round-table discussions show that many of the stakeholders are positively motivated as regards attitude but the majority of stakeholders experienced mainly negative motivation in terms of economic and competition-related dimensions. This is understandable in light of the limited demand for products with improved environmental properties - cf. Chapter 5 on the market. If the initiative is to have any proper clout, a successful change in the motivation picture is a prerequisite. This calls for a change in the negative conditions and expectations from demand, costs and distortion of competition.

The pioneers and the sceptics

On the part of some manufacturers, trading companies and consumers, the current product-orientated environmental initiative is largely characterised by being propelled by "fiery souls", motivated by a mixture of their attitude towards and their faith in the long-term sense and necessity of such efforts.

It is essential that the product initiative is targeted at the many and varying degrees of sceptics in the various stakeholder groups and, at the same time, is able to support and co-operate with the pioneers.

may be altogether vital in making environmental improvements to production processes.

Different scope

The scope available to decision-makers is very different from one product group to another, and from one resource area to another. Within certain resource areas, the retail trade plays a dominant role in relation to the manufacturers while other resource areas are dominated by large international raw materials suppliers and subcontractors who constrict the options of the final manufacturer.

Targeted efforts

Product initiatives need to be targeted at specific resource or product areas. Within these individual areas, the central decision-makers must be identified so that the conditions and frameworks governing their decision-making can be changed.

The following review of the stakeholder groups examines the stakeholders' general features and the conclusions that can be drawn on this basis for any product initiative. Aspects specific to product areas are touched upon in the description of initiatives in selected product areas.

6.3 Which stakeholders are central to the product initiative?

A stakeholder's importance for a product initiative is determined by his ability to contribute to the development, production and sale of more environmentally sound products. The environmental properties of a product are a function of the actions and decisions taken by various stakeholders during different parts of the life-cycle of the product group and that of the individual products.

Properties determined in the development phase

During the development phase, the properties of each individual product are determined together with the principles for its manufacture, use and disposal. The development phase is thus crucial to the overall life-cycle impact. However, the individual developer is normally limited by the specialities and routines of his particular company. The willingness and ability of an individual company to innovate will often depend on its internal resources as well as on external conditions.

Good opportunities during the production phase

During the production phase, the manufacturer has the chance to influence the amount of environmental impact due to production - assuming environmental impact is not an invariable consequence of the properties of the products. For services, in particular, the very production process is entirely crucial to their environmental impact.

Resources

The stakeholder's possibilities of contributing to the product-orientated environmental initiative depend on the internal resources available, and on the options open to the stakeholder for drawing on the resources of the world around him.

Internal resources

Internal resources include know-how, manpower and capital.

Know-how

The stakeholder needs know-how on environmental conditions in general and of the environmental problems which it is most important to influence - including a knowledge of the possibilities open to the stakeholder for doing something about these problems. For the consumer it will include e.g. a knowledge of the environmental impact of the goods and knowing which available goods to choose between while, for the product developer, it will include the entire gamut of knowledge needed for developing new products and for assessing the environmental consequences of the different choices during the design process.

Qualified labour and capital

Access to qualified labour and capital is a prerequisite if the stakeholder is to have the resources to carry out projects able to bring about a change in environmental impact. If, for example, a retailer is going to markedly increase the environmental information available to his customer, this will require that the organisation establishes a system capable of procuring this knowledge. It also presupposes that employees should be trained to disseminate that knowledge to the customers.

External resources

The external resources of importance to environmental initiatives include general framework conditions, access to labour and financing, and demand and infrastructure, as described in Chapter 5 on the market. In particular, they also include access to filling in gaps in the stakeholder's internal know-how from external sources - e.g. from the authorities or other stakeholders.

Scope

Dependence on others

Decisions made by the stakeholders with regard to product development or marketing take into account stakeholders' interaction with other stakeholders. A company responsible for an end product does not always have e.g. the power to implement all that it might like to in its dealings with raw material suppliers and subcontractors. If the stakeholder has to use e.g. a paint finish, for example, the market is dominated by a very small number of multinational suppliers. A medium-size Danish company is completely dependent on availability of finishing materials on the market. In a number of cases, the same goes for processing machinery, which

<i>Marketing and distribution</i>	A number of factors causing environmental impact can be traced directly to distribution in the form of pollution from e.g. packaging and transportation. In addition, the marketing and distribution determine which products are accessible to the other stakeholders and what information is available together with the products.
<i>Customers, users and waste handlers</i>	The number of customers choosing to purchase a given product determines the total use of that product - and hence, to some extent, also the total environmental impact of the product. Its use affects the environmental impact just as the way in which the user chooses to dispose of the product is important. With regard to disposal, the technologies used by the waste handlers will be of special importance.
<i>Central stakeholders</i>	The developers, manufacturers, distributors, customers, users and waste handlers are thus stakeholder groups whose choices and activities are of special importance to the environmental impact.
	In this context, the manufacturer is not just the maker of the end product but also those manufacturers producing energy, raw materials, semi-manufactures and ancillary agents used in the making of the end product. The distributors are the traders and carriers conveying the flow of products between the other stakeholders. The customers and the consumers are everyone - public and private customers alike - who purchases and uses the end products. The waste treaters handle the products after use. These stakeholders are both Danish and international.
<i>Stakeholders who establish general frameworks</i>	In addition, there are stakeholders who are instrumental in establishing various essential frameworks for the activities of the central stakeholders, including such conditions as financing, manpower, know-how and regulations:
	<ul style="list-style-type: none"> • The financial sector provides capital for activities. They can make requirements in terms of both environmental information and environmental behaviour if such behaviour is of importance for their financial interest. • The employees can choose where they want to work, and they can bring their influence to bear at the workplace. They can also choose to undergo training, enabling them to contribute more qualifications. • The knowledge-builders such as colleges, universities and sectorial research institutes can influence where knowledge is developed, what problems are discovered and what solutions are found.

- The know-how brokers, consultants and media have a huge influence on the know-how available for other stakeholders' decisions.
- The developers and enforcers of rules and laws are of pivotal importance. Rules generally spring from political processes involving politicians, special-interest groups, voters and authorities. They are subsequently anchored with the authorities in the normal way.
- The educational institutions have a vital influence on the qualifications of the labour force that can be recruited by companies.

Organisational stakeholders

The various stakeholder groups have built up organisations that act as spokesmen for these groups. There are great differences in the functioning of these organisations. As the organisations usually collaborate on environmental initiatives, it is essential to examine which organisations mediate the interests of the stakeholders. The organisation of civic interests, in particular, is complex as citizens organise themselves in different ways as consumers, employees and pro-environmentalists, on the basis of leisure activities, political interests, etc.

International stakeholders

Moreover, on the international negotiating stage, there are a number of stakeholders of significance to product initiatives. This applies to the large multinational companies, the different nation states and some of the international organisations that are mandated and resourced to represent independent viewpoints during the negotiations.

Joint understanding

Product initiatives must be based on an understanding of the individual stakeholders' conditions, resources and interests. Such an understanding is not static but must be built and developed in collaboration between the stakeholders as the product initiative evolves.

The three main stakeholders

The three main stakeholders in the product initiative are described below - the consumers, the goods manufacturers and the trade sector. Finally, a summary is given of the main consequences to the product initiative of the descriptions of the other stakeholders (see Appendix 1).

The descriptions are brief accounts of stakeholders based on aspects regarded as being essential to the product initiative. These descriptions are intended to constitute the discussion paper for the discussions with stakeholders on which the concretisation of this proposal will be based.

6.4 The consumers

Private consumption important to the environment

In 1994, Danish consumers' demand for goods totalled approx. DKK 500bn - corresponding to more than half the total demand in Denmark. In particular, the money was spent in the retail trade - where foodstuffs make up the largest single item - on the home, on transportation and on communications. Private consumption, calculated *ad valorem*, has more than doubled since 1950. A substantial part of the environmental impact from products can thus be attributed to private consumption. From the family's activities, a recently completed project has singled out meals, transportation and residential heating as being environmentally most significant /16/.

The population affects the environmental impact of products in a number of different capacities. As citizens, individuals are involved in ongoing social developments; and by voting and other political activities, they influence priority-setting in environmental and industrial policy-making. As consumers, we determine which of the available products that sell, how they are used and what happens to them during the initial stage of their disposal.

Highly organised

Compared with other countries, the Danes generally have a high degree of organisation. A sizeable proportion of the population is represented in trade unions and pension funds as wage earners and employees. In recent years, a number of trade unions have begun to view the external environment as part of their sphere of interest. For instance, in its programme manifesto /17/, the Danish General Workers' Union (SID) enters into a series of deliberations on the product dimension.

Many Danes are members of various leisure and special-interest organisations dealing with specific areas of interest and related political initiatives. In terms of the environment, for instance, hunts and angling associations are very active.

Environmental organisations

The organisations in the environmental field range from the highly practical, action-minded "Green Families" and "Green Lifestyle" through traditional grass-roots movements such as NOAH (- Friends of the Earth Denmark) and the Movement on Energy and Environment (OOA) to broad-based environmental movements, whose membership-driven funding allows them to have considerable specialist secretariats - e.g. the Danish Society for Nature Preservation. Various such organisations are affiliated to international movements such as Global Action Plan for the Earth, Friends of the Earth and Greenpeace.

Consumer organisations

In consumer issues, the interests of the population at large are safeguarded by a number of consumer organisations, some of which are linked with international organisations such as the European Environmental Bureau. They mainly focus is on issues such as consumer information, quality, health, the environment and prices. The way in which the individual associations prioritise different issues varies greatly. For instance, the Danish Consumer Council prioritises all issues of relevance to the consumer whereas the many buying groups and purchasing associations assign priority to obtaining cheap products.

In a product initiative, it is essential to involve the actual environmental organisations as well as the consumer organisations and trade unions in order to obtain real representation of interests and resources.

Motivation

Successful involvement of the population in a product initiative presupposes that the population is motivated and informed, and that it has adequate opportunities to modify its actions. There is considerable difference today between the proportion of the population stating that they wish to act and shop in an environmentally sound manner and the proportion actually buying environmentally sound products. A study from 1995 of the population's attitudes towards the environment and energy saving showed that e.g. approx. 75% of the respondents stated they are willing to pay 20% more for organic foods and kitchen hardware that economise on energy or water /18/.

Many less environmentally degrading products are more expensive than similar ordinary products today. The size in price difference, together with a number of other factors such as taste, availability and marketing, decides how great the demand for the product will be. The consumer panel at the Danish Consumer Council and the Council of Technology's consensus conference on future consumption and environment attached great importance to the price of goods encouraging environmentally sound consumer choices /19/.

There is experience to show that large parts of the population can be induced to take action on isolated environmental or health problems after an intensive media campaign. Participation is greatest in situations making extra demands on people. The change-over to unleaded petrol is almost complete now but it was also supported by the fact that it is easy and, at the same time, involved financial benefit for the consumer.

Close to the individual

It is a well-known fact that it is easiest to motivate to efforts that are closely related to the individual, rooted in the local community or, in some other way, impact directly on the consumer.

Easier access to simple information

The population at large currently needs easier access to information on the environment to enable it to act in line with its outlooks in the environmental field. Many are currently aware of a long string of aspects that can be included in evaluating the environmental impact of products. Yet, no overview is generally available of what can and should be taken into account in one's choice of consumption, or more detailed and comparable information on individual products.

At the same time, there is an overwhelming quantity of marketing messages that pretend to be factual environmental information but are actually misleading. As an example, a study of different clothing brands marketed as being environmentally sound by almost 40 different suppliers shows that only a few of the suppliers were in a position to supply precise documentation of the environmental properties of their clothing /20/. This misinformation leads to widespread scepticism with regard to environmental information.

The consumer panel at the consensus conference on consumption and the environment stressed that the consumer must be encouraged to make less environmentally degrading choices through information and dialogue. Of the concrete possibilities available for better information, the panel highlighted the "Swan Label" (the Nordic eco-label) and environmental product declarations.

Locally sourced knowledge

Consumers have a considerable need for easy access to relevant information on the environmental impact of products. Information to the consumer must be accessible at the right time in the right place. People especially want information from local sources such as retail outlets, local craftsmen and businessmen, fast-service counters, citizens advice bureaux and libraries. In addition, there is a need for knowledge about where to look for information on specific topics.

Limited access to environmentally sound products

There is still a limited selection of products identifiable through recognised labelling schemes, declarations or the use of data sheets as being less environmentally degrading. In order to keep up the population's interest, it is important to quickly boost this selection. Conversely, the rate at which the selection is increased, will largely depend on the reception that consumers give to the initial product selection. The consumer must thus be kept regularly informed about the presentation/identification of new, less environmentally degrading products.

6.5 The trade sector

Small Danish trading companies

The majority of Danish trading companies are small companies. More than half of them have an annual turnover of less than DKK 2.5m (1992) and almost 60% of the 36,000 VAT-registered wholesale companies have a turnover of less than DKK 1m (1993).

Turnover for the 44,000 VAT-registered retail companies averaged DKK 2.7m in 1991. The past decade has seen a structural trend towards larger company units and fewer shops/workplaces. Combined, the Danish Co-op (FDB) and *Dansk Supermarked* account for more than half of the turnover of the retail trade today.

42% of turnover in Denmark are effected in the trade sector, and 45% of Danish exports are effected by the trade sector /21/.

A pivotal role

The trade sector plays a pivotal role with regard to the product strategy as it has to function as a filter between manufacturers and purchasers. The sector is responsible for which of the approx. 200,000 different products available on the market that find their way onto the grocery shop shelves. It is not uncommon for a grocery store to stock between 1,000 and 3,000 different products.

Given that some 60% of goods are imported, it is important for the importer to pass on wishes and requirements to the foreign manufacturers with regard to the environmental properties of products. The trade sector plays an altogether pivotal role with regard to information as it can demand but also pass on information regarding the environmental properties of products.

Potential for interaction between trading companies and manufacturers

There is considerable potential for interaction between trading companies and manufacturing companies. Fruitful interaction may contribute to ensuring that:

- products with improved environmental properties are made available to all potential buyers
- the manufacturer can procure information on the environmental properties of the product
- information on the environmental properties of the product is made available to consumers and purchasers.

Danish-based production preferred

On the face of it, the greatest potential for initiatives by the trade sector involves product groups in which production is based in Denmark. Such products give the authorities, the consumers, and the wholesale and retail trades the possibility of acting as a powerful, collective dialogue partner in dealings with the manufacturers - without their requirements leading to a market take-over by foreign manufacturers. Especially for Danish products with a sizeable home market and exports to markets with a high level of environmental awareness, product initiatives can be relevant.

Difficult for smaller trading companies

Smaller trading companies are often supplied by a large number of manufacturers and do not have the volume or professional competence to make requirements to the manufacturer or supplier. This fact has assumed increasing importance, given the increased competition accompanying the creation of the Single Market. Of their own accord, these companies are thus unlikely to demand documentation of environmental properties or refuse to trade in products with the most inferior environmental properties.

Opportunities for big chains

The big chains within the retail and wholesale trades are very powerful stakeholders, capable of building up their own specialised environmental competence and making requirements to the manufacturers. As they themselves control parts of the production, they also have their own facilities for product development.

The trade sector's views

During the round-table discussions, representatives of the trade sector expressed that:

- The retail trade is prepared to help improve consumer information on the environment.
- Far better environmental information is needed both for the purchasers in the retail trade and for the consumers.
- Dissemination of know-how within the sector is conditional on manufacturers being able and willing to supply the necessary information.
- The experience is positive when it comes to environmental information on products. Suppliers are willing and able to provide relevant information when environmental properties are made a balanced competitive parameter.

- There is great interest in ensuring a wider spread of the experience gained with green procurement policy - e.g. by providing the retail trade with product data sheets as soon as they become available.
- Environmental management systems for use in wholesale and retail companies need to be developed.

6.6 Manufacturers of goods and services

The group of goods and services manufacturers includes all companies contributing to the development and manufacture of the products. These stakeholders are of crucial importance to the environmental properties of the product. They are also crucial in determining what know-how is generated and disseminated on the environmental properties of the products and how these properties may be improved.

Danish and foreign companies

Approx. 40% of the goods consumed in Denmark are Danish-produced, and virtually all services supplied in Denmark are produced here by Danish and foreign companies. Developing and manufacturing products with improved environmental properties presupposes active and creative initiatives from Danish as well as foreign manufacturers - and from manufacturers in charge of their own development initiatives as well as manufacturers who put others' ideas into production.

As a group of stakeholders, the manufacturers are decisive to product initiatives, and any product initiative is conditional on setting up constructive interaction with the manufacturers and obtaining an in-depth knowledge of their conditions within the various resource areas.

Description of manufacturers

The conditions of the manufacturer group vary greatly, depending on the product involved and on which market it is sold.

Goods manufacturers

Private production of goods contributes approx. 1/3 of the GNP and employs a corresponding share of the labour force, i.e. approx. 750,000 full-timers.

The goods manufacturer group comprises the following sectors: manufacturing, building and construction, and agriculture, of which the manufacturing sector is the most important of these in terms of economy and employment.

Both internally and mutually, the individual sectors are subject to widely different conditions of competition and development. However, one basic

feature in common is that companies are increasingly being drawn into a global division of production, with the individual company processing a minor subcomponent of the finished end product.

Service producers

Producers of services include a large and very heterogeneous group of companies, including everything from international currency trading through forwarding agents to shoe resoling. The importance of service production in Danish society is rapidly growing. The Danish Ministry for Business and Industry's resource area analysis estimates that the service trades have an employment growth potential equivalent to 100-125,000 new jobs up to the year 2003.

Though intangible by definition, many services do cause an impact on the environment as a number of products are normally used for producing a service, e.g. detergents, machinery, spare parts, chemical substances, etc., just as they nearly always involve transporting goods and people.

The choice of products and organisation of work routines is decisive to the overall the environmental impact caused by the service. Furthermore, the service sector is important to the product initiative in so far as the services in themselves contribute to that initiative. This applies to e.g. the services of the financial sector and to those of the know-how suppliers and suchlike. These stakeholders are discussed independently in Appendix 1.

Limited knowledge of services and the environment

The knowledge available on environmental conditions in connection with the production of services is very limited. This is partly due to the limited extent to which the service sector has been the focus of current environmental initiatives. The following description has therefore been concentrated on the conditions of the goods manufacturers.

Corporate environmental behaviour

Most goods manufacturers today have a good grasp of the environmental impact from their production processes, many having accumulated a certain environmental know-how as a result /22/. Very few companies have dealt with the impact caused by other parts of the product life-cycle.

Pioneer companies

There are, however, a number of pioneer companies already making a goal-oriented effort to improve the environmental properties of their products. They are to be found in all categories of companies though, of course, mostly in those categories with the largest in-house development resources. The change in managerial attitude is the one single factor emphasised by the pioneer companies as being most significant to their change-over from being "wait-and-see sceptics" to being "active pioneers". This change of attitude is not immediately explicable on the basis

of changing requirements from the outside world or other objective factors. Rather, it should be seen as a change in the understanding of these factors. Accumulating know-how regarding the causes of these changes in attitude and how they can be promoted is essential to the product initiative.

In the further work on the product-orientated environmental initiative, it is also important not only to support, but also to derive support from, the work being done at these pioneering companies. In particular, co-operation should be established with pioneer companies in the product fields in which pilot projects are initially being launched.

Product development

The development of products with improved environmental properties will need to be made as an integral part of the general development activities of the companies. It is thus interesting to look at the conditions for these activities in the case of Danish goods manufacturers. Taking product development as a basis, Danish manufacturing companies can be divided into four types:

- Traditional small and medium-size manufacturing companies
- Large-scale operations
- Specialised machinery and equipment manufacturers
- Research-based companies.

Traditional small and medium-size companies

Companies with few resources to make product and process innovation. The product and process development of the companies is determined by input from machinery and materials suppliers as well as external resource and know-how centres. Product development collaboration - between the companies as well as with the public sector - is vital for product development in many such companies.

Large-scale operations

Companies focusing on process development, with large in-house capacity to undertake it. Dairies, sugar mills, etc.

Specialised machinery and equipment manufacturers

Flexible, often smallish, manufacturers with a high degree of product development that is customer specific. Manufacturers of industrial paints, sealants, etc.

Research-based companies

Companies based on the company's own R&D capacity carrying out continuous product development. The developmental force in these companies is based largely on in-house resources in relatively close co-operation with public R&D institutions. To a large extent, the process of consolidating the environmental dimension of the product development

of these companies is done by incorporating environmental assessments as a permanent element of publicly subsidised R&D projects.

Table 6.1
Development activities in industry, broken down into company types

Company type	Typical products	Proportion of R&D of industry as %	Proportion of people employed as %	Average number of staff
Traditional manufacturing	Textiles, furniture, household equipment	10	38	73
Technology-based companies	Medical & pharmaceutical equipment, electronics	47	8	199
Machinery and equipment manufacturers	Instruments, production equipment	26	19	110
Large-scale operations	Food, paper pulp, ships, glass	16	34	182

Source: 1995 Business Report

The various forms of developmental behaviour and competence require some differentiation of the means and instruments used in relation to specific company types.

Factors of importance to development

The following factors are essential to the developmental behaviour of the companies:

- Customer requirements
- Internal competence
- The quantity and quality of available environmental know-how
- Environmental regulation
- Product standards

Customer requirements

Customer requirements are among the most important reasons altogether for companies making innovations in the product field. The ever increasing spread of environmental management systems within major international groups will largely result in requirements being made to sub-suppliers with regard to substantiating the environmental properties of their sub-supplies. Especially within the group of specialised machinery and equipment manufacturers, there will be a distinct need for sub-suppliers able to document the environmental conditions of their products and their company.

In research-based companies and within the medical/health and telecommunications fields, the public sector often plays a crucial part as

product purchasers. Public development contracts containing environmental requirements will be a good tool with regard to swaying product innovation towards the development of cleaner products.

Internal competence

Developing cleaner products calls for the company organisation to be able to pick up on signals in the environmental field. At the same time, the resources and competence must be available to respond to these signals. In relation to smaller companies, it is especially vital to enhance internal competence. The results of the programme "The Environment and Working Environment in Small Companies" show that a low level of developmental and environmental competence in-house is greatly strengthened by appointing competent employees to build up environmental and working environmental management in these types of company.

Quantity and quality of available environmental know-how

A main condition for including environmental considerations in product development is the presence of reliable and usable environmental know-how. At general level, the quantity and quality of environmental product know-how is still in the early stages of development.

Environmental regulation

The product innovation time frame stretches several years into the future for major companies belonging to the categories of large-scale and research-based companies. It is central in this regard that there should be some long-term indication as to the environmental problems that need to be prioritised, e.g. substances and materials that should be substituted. Such an indication will provide important guidelines for the often sizeable investments in development made by these companies.

Furthermore, there should be some regulation of individual substances and materials in a co-ordinated joint effort to develop new substitutional technologies.

Product standards

Much of the time, the bulk of corporate product development is elaborated on the basis of pre-determined product standards. In continuation of the work of creating the EU Single Market, product standards will play a sharply increasing role. To an even greater extent, compliance with particular standards will determine the sale of goods and semimanufactures.

Inclusion of environmental considerations - or, at least, of awareness of not *preventing* environmental consideration - in the individual product standards will thus be of great importance. Care must be taken that standards have a supportive effect and, more particularly, do not block the development of less environmentally degrading products.

Larger companies will be able to act as important allies by incorporating environmental criteria when negotiating international product standards.

6.7 Other stakeholders - consequences to the product initiative

Appendix 1 contains a description of know-how producers and brokers, the financial sector, counties and municipalities, government stakeholders and, to exemplify international stakeholders, a description of the multinational goods manufacturers, the nation states and the European Commission. The following is a summary of the main consequences to product initiatives that may be derived from these descriptions. The initiatives proposed in the next chapter are partly based on these analyses.

Know-how brokers

The know-how brokers and manufacturers must be involved in the discussions on organising the product initiative, partly in order to incorporate the know-how they represent and partly in order to ensure their active backing for further efforts. The know-how brokers generally need to be provided with greater know-how on the environment.

Public funding is crucial to producing publicly available knowledge and to producing know-how whose generation is without commercial interest.

The financial sector

For parts of the business community, particularly the small and medium-size companies, it is difficult to get credit to finance new projects such as product development. It is thus important for product initiatives to include financing options for companies wishing to develop and introduce products with improved environmental properties.

Product initiative backing by the financial sector presupposes the existence of a positive link between the product initiatives of the companies and their ability to honour their obligations to investors and lenders.

It is important to supply the financial sector with the necessary competence in the environmental field. This can be done primarily in the form of training and supplementary training efforts within the sector.

Counties and municipalities

It is important that counties and municipalities are actively involved in the product initiative. They are important not only as supply companies and environmental authorities but also as macroconsumers and promoters of business innovation and Agenda 21 activities.

Genuine activation of the potential of the local authorities will require political and financial backing.

Greater use of cleaner products within the supply and welfare services requires a generally higher level of know-how on the environmental impact of products.

In terms of local use of products containing environmentally problematic substances that cause problems to waste and wastewater treatment plants, the municipality can play an active informative role in reducing the local use of such substances.

The official sector

The official sector has activities in a number of fields of importance to the product initiative.

The extent, to which environmental assessments are carried out, is insufficient when various forms of private-sector product development are being publicly funded.

Many ministries are already making environmental requirements in administering their subsidy and loan schemes. In particular, the Danish Ministry for Housing and Building and the Ministry of Agriculture and Fisheries have incorporated environmental considerations in their product-orientated subsidy schemes. There has not been the same degree of development in relation to the Ministry for Business and Industry's grant and loan-financing schemes. What is needed is a more systematic environmental assessment of company projects eligible for financing by, e.g., the Danish Fund for Industrial Growth. Easy-to-use tools are also desired with which to screen these types of projects from an environmental angle.

The main responsibility for a large number of product and performance standards rests with the sectorial ministries. Furthermore, they are the main negotiators on EU directives within their areas of jurisdiction. As a fixed procedure of standardisation activities, sectorial ministries should contribute to ensuring that environmental assessments are directly involved in the standardisation process. In the context of EU legislation, sectorial ministries should ensure that environmental considerations are embodied in the actual directive work and that environmental assessments are included as a requirement in any mandates made of CEN.

Government procurement of food and beverages, medicine, health care articles and office supplies as well as fuels such as oil, electricity and gas form an essential part of the total Danish turnover on the relevant product

groups. For this very reason, it is essential to have a consistent public and eco-conscious procurement policy in these and other areas in order to establish a stable market for less environmentally degrading products.

Know-how and information on the environmental properties of products are part of the basic instruments used in the product-orientated environmental strategy. The Danish EPA's co-operation with the National Consumer Agency of Denmark should be strengthened and campaigns coordinated in terms of the areas of action on the energy front.

International stakeholders

The initiatives from the European Commission within the environment, trade and standardisation are of crucial importance to conditions for manufacturing and selling less environmentally degrading products. In particular, it is possible to influence the elaboration of these initiatives at an early stage of the process.

The European Commission is planning to elaborate a product-orientated environmental strategy. Neither here nor in any of our neighbouring countries that are working on a product-orientated environmental initiative has particularly much progress been made, however.

The Netherlands

The Netherlands have learned that a purely information-based effort targeted at consumers is not sufficient. Also, other kinds of market influence are needed. Since the mid-eighties, the Netherlands have had an official list of undesirable substances. The experience gained from this list is that it has very largely been appreciated and used as an instrument in the product development work of the companies.

Germany

Germany's experience with manufacturers' liability for packaging waste (the *Grüner Punkt* system) shows that it is possible to achieve considerable waste reductions in this way, but that the cost of doing so has also been very high. Work is continued to extend manufacturers' liability to all parts of the product life-cycle.

Sweden and Norway

Also Sweden and Norway are working on initiatives targeted at all parts of the product life-cycle though no experience has yet been collected on the impact of such efforts. Here again, work is being done to increase manufacturers' liability for all parts of the product life-cycle.

In terms of interaction with other countries, it should be realised that the long-term prospects of a growing market for environmentally sound products mean that this interaction is not a "zero-sum game". In a growing market, one man's gain needs not mean another man's loss.

7 Proposals for specific initiatives

7.1 Introduction

Chapter structure

This chapter presents the Danish EPA's proposals for the organisation of an intensified product initiative in the years ahead. First, the chapter contains a brief summary of the conclusions that can be drawn from the analytical chapters. As an introduction to discussions on future initiatives, a number of specific proposals for initiatives follow.

7.2 Background to the choice of instruments and areas of action

The proposed initiatives are based on concrete experience and results of current initiatives in the field. The conclusions concerning product descriptions, market and stakeholders, as presented in the preceding chapters, have also been used as a basis.

The need for action

Main conclusions of the analyses

The analyses in Chapters 4-6 led to the following main conclusions regarding the need for action:

- All stakeholders should be provided with know-how on the environmental impact of products. This knowledge must be tailored to the stakeholders' needs and possibilities of understanding and using it.
- The various stakeholders should be given increased scope for action. For manufacturers, this means aids to developing less environmentally degrading products. For the trade sector and consumers, it will mean a wide range of goods with improved environmental properties.
- Financial barriers to the development and sale of products with improved environmental properties should be eliminated. There is a vicious circle of small demand and resultant high prices. This results in even smaller demand and a limited inclination to develop products with improved environmental properties. This circle has been broken in a few areas and efforts must be targeted at breaking it in as large areas of the market as possible.
- The conditions on which products with improved environmental properties compete should be consolidated, both in the environmental

field and in all other dimensions crucial to the competitiveness of the products.

- There should be co-ordination of all relevant public-sector measures in operation within the framework of the Government as well as local authorities. These should all pull in the same direction relative to the product initiative.
- There should be international initiatives to achieve the greatest possible global coverage and, hence, effectiveness for product-orientated environmental initiatives, as well as efforts to ensure that international trade agreements and standardisation work do not end up impeding regional or national product initiatives.

Choice of instruments

Instruments

As regards what shape the initiative should take, the analyses partly indicate a need for interaction between different instruments and partly a need for instruments to build up stakeholder resources, as well as a need for instruments to provide stakeholders with options.

Interaction of instruments

The behavioural changes that product initiatives aim to achieve cannot be brought about with one instrument or by one isolated stakeholder. The problems involved are too great and complex for that. Furthermore, the resource areas are so varied in structure and dynamics that each individually will require a special combination of instruments. The challenge in the product-orientated environmental initiative is to create interaction between relevant instruments and relevant stakeholders.

Stimulating instruments

Instruments such as the supply of know-how or financial resources to stakeholders help build up resources on the part of the individual stakeholder. They can thus be expected to make a contribution both to their environmental behaviour and to increased competitiveness.

Stimulating instruments are suited to areas in which it is important to influence many stakeholders but the individual's behaviour is not decisive. Stimulating instruments achieve their effect by creating an interaction between the behaviour desired and that which is in the stakeholders' own interest - and which they thus work to achieve.

As the success of any product-orientated environmental initiative is entirely dependent on a productive wave of behavioural changes in the environmental field - and is thus dependent on Danish and European companies retaining their competitiveness on the global market, prescriptive behavioural regulation needs to be supplemented with behaviour-

stimulating action. Direct behavioural regulation or the threat of such may have a stimulating effect on creativity but it cannot specify creativity.

In areas where the desired conduct is not known, direct behavioural regulations are neither desirable nor possible. This applies to e.g. innovative processes. Creativity cannot be ordered on command. Nor indeed can competitiveness. But it is possible to actively stimulate.

Instruments such as taxes and penalties may provide some motivation for environmental initiative but do not in themselves contribute to building up the resources of the organisations. Particularly when they hit Danish companies harder than their foreign competitors, these instruments may injure their competitiveness and hence the environmental initiative. This is the reason why e.g. compensation is awarded in connection with a series of the present environmental taxes.

Behaviour-specifying instruments

Directly behaviour-specifying instruments are suitable in areas in which the desired behaviour is known and in which it is essential for everyone or nearly everyone to fulfil the behavioural requirements. Elimination of substances hazardous to health or the environment from the most common products is a suitable candidate for direct behavioural regulation, for instance.

Direct behavioural regulation is covered by the international agreement systems of which Denmark form part. The development of direct behavioural regulations thus presupposes initiatives in the relevant international forums. International negotiations occasionally proceed more slowly than might be desirable from a Danish point of view. There may therefore be a need for supplementing these with other instruments/regulations.

From an enforcement perspective, behaviour-regulating instruments have a greater chance of being effective if they are backed up by soft instruments so as to give stakeholders a feeling of conformance between their "duties" and their overall interests.

Stakeholders' comments on the choice of instruments

A number of the above conclusions have been confirmed at the round-table discussions held /23/.

Need for motivational instruments

The stakeholders express a desire for positively motivational economic instruments like subsidies and support for the necessary activities.

Focus on competitiveness Taxes and charges are recognised as being effective instruments but taxes on CO₂ and SO₂ are criticised especially by the trade and industry for reducing the competitiveness of Danish companies in relation to foreign companies.

Need to regulate the use of environmentally hazardous substances When the phasing-out of environmentally hazardous substances is concerned, there is broad consensus that direct behavioural regulations are probably the most expedient method.

Need for co-ordinated public efforts A certain amount of public regulation is characterised as being uncoordinated and unclear. There is a wish for co-ordination of public efforts related to products; e.g. within trade and business promotion, training, sectorial development programmes, etc.

Need for international efforts Time and again, efforts to influence the elaboration of international rules are stressed as being altogether crucial.

Proposals for areas of action

Danish EPA's proposals for areas of action The Danish EPA proposes that specific initiatives are initiated within the following areas of action:

- Declaration of long-term environmental goals and of expectations of stakeholders' behaviour.
- Accumulation of know-how and dissemination of information on the environmental properties of products.
- Development of the market for environmentally sound products, especially through increased eco-conscious public procurement.
- Projects in specific product areas with a view to gathering concrete experience with product initiatives.
- Support for the development and market launch of products with improved environmental properties.
- Intensified regulation of the use of chemical substances.
- Consolidated national co-ordination of public activities of importance to product initiatives.
- A consolidated international effort.

The proposed initiatives above are amplified in the following sections.

7.3 Presenting goals and behavioural expectations - the environmental agenda

Long-term environmental goals and behavioural expectations

This section presents the Danish EPA's proposal for the long-term environmental goals on which the product initiative will need to focus for a series of prioritised problems. In connection with these goals, the section outlines a series of changes in stakeholders' behaviour which are currently considered necessary if the environmental goals laid down are to be achieved. In Appendix 2, the long-term environmental goals, the goals stipulated in practice and behavioural expectations are described in detail.

The presentation of this environmental agenda is intended as a support to all stakeholders who are themselves taking initiatives to reduce the environmental impact of products. A knowledge of the agenda will make it easier to predict the conditions under which the environmental field will operate in future years and hence make it easier to act. At the same time, a knowledge of the agenda is intended to create a uniform understanding among the stakeholders of the goals and behaviour on which the product initiative should be focused.

The issues remain unchanged

With regard to the long-term environmental goals, there is reason to assume that these will not change greatly in the next decades. The vast majority of basic environmental problems which it was decided to tackle in 1974 when the Danish Environmental Protection Act was passed, are still extremely important today. More have been added and more are presumably to come.

If, in their long-term environmental work, the stakeholders contribute to solving the fundamental environmental problems, they will be well equipped to participate on an environmental-orientated market.

The political declarations

Politically stipulated goals must reflect many different aspects

For most basic environmental problems, political goals are regularly set for a foreseeable number of years together with more or less detailed directions explaining how these goals are expected to be reached. These goals and behavioural expectations are usually fixed on the basis of both technical environmental and health-related evaluations, taking into account social, industrial-policy and international factors.

For this reason, relevant goals and behavioural expectations are also discussed regularly, i.e. with the stakeholders at whom they are directed.

Reaching stipulated goals, acquiring fresh knowledge in the field or achieving new political initiatives can thus lead to changes in the concrete goals and behavioural wishes set out in the action plans.

Great difference in action plans

There is a great difference in the degree of concretisation and specification with which environmental goals are proclaimed. In general, however, politically adopted plans do provide a good basis for evaluating which environmental problems are relevant to the stakeholders. They also contain the goals which it has been politically possible to lay down on the medium view. There is, however, greater variation in the guidelines that define what is a satisfactory level for the individual stakeholder or product group, how that level is achieved using different instruments and how the impact of such efforts is to be measured.

In many instances, this entails the individual stakeholder himself having to decide how to put the planned objectives into concrete practice whether it is in isolation or in context.

Stakeholders' involvement in establishing goals and efforts

That is also how things will be in future. It is a difficult task that can only be solved in close dialogue between the authorities and the stakeholders in the field. Yet the alternative - having the authorities make highly detailed objectives and initiatives tailored to the conditions of individual stakeholders - would be an impossible task for the authorities in terms of professional and labour resources. At the same time, it would have a paralysing effect on the stakeholders.

Table 7.1 summarises the long-term environmental goals in the various prioritised problem areas and the expectations linked to the stakeholders' behaviour. The prioritised problem areas all refer to one or more of the four global issues briefly described in Chapter 2.

In the field of chemical substances, the Danish EPA has just designated approx. 100 problematic substances and substance groups. The substances have been included in the Danish EPA's draft "List of Undesirable Substances", which is included in the EPA's discussion paper "Chemical substances - Status and Perspectives" /24/. These approx. 100 substances and substance groups have been singled out on the basis of a particular systematics (see Section 7.7), and there may be other relevant substances, which have not been identified by the procedure outlined.

Appendix 2 provides an in-depth review of the individual elements on the environmental agenda.

Table 7.1

Long-term goals for the impact on the environment and resources as well as goals for stakeholders' behaviour in prioritised problem areas

Prioritised environmental and resource problems	Desired solution	Long-term environmental and resource goals
Spreading in the environment of substances with an appreciable environmental or health hazardous effect	Substitution, particularly of the substances on the List of Undesirable Substances	To minimise as far as possible the impact of chemical substances during their life-cycle on humans and the environment
Spreading in the environment of xenobiotics with an unknown effect	Substitution to substances acceptable from an environmental and human health point of view	Reduction in the use of substances with an unknown effect
Greenhouse effect	Radical energy optimisation, restructuring to CO ₂ -neutral and renewable energy sources	To halve the discharge of CO ₂ by the year 2030
Ozone layer depletion	Phasing-out of all substances that deplete the ozone layer	Restoration of the ozone layer
Smog	Reduction of VOC and NOx emissions	No effect on humans and ecosystems
Nutrient load	Reduction of discharges	No effect on the ecosystems
Overexploitation of biological and other renewable resources	Increase in resource efficiency; wherever possible use of local resources from sustainable operations.	All exploitation of renewable resources must be sustainable
Exploitation of mineral resources and hydrocarbons	Increase in resource efficiency. Substitution to renewable resources	To minimise resource losses, particularly for resources with a supply horizon of less than 100 years

The terms used are defined as follows:

Resource efficiency: Consumption of resources per product or function fulfilled. *Substitution:* Replacement of an environmentally degrading property with a less environmentally degrading one. *Resource loss:* Reduction in the volume of resources available for social exploitation in a given area at a given cost level. *Supply horizon:* Period during which a given resource will be available to a particular extent using practically accessible process technology. *Substances with an unknown effect:* Substances whose impact on the environment and health have not been scientifically studied. *Sustainable operation:* Production of biological resources while maintaining the biological productivity of the area and at the same time respecting other ecosystems and local social considerations.

Efforts to concretise the environmental agenda

An independent objective of the product initiative is to help stakeholders better understand and embrace the environmental agenda. By means also including dialogue with the authorities, stakeholders should become more capable of relating their own situation to this agenda and able to better see their own possibilities of complying with the agenda.

The environmental agenda

The authorities must promote this understanding i.a. by:

- Continued efforts in international forums with regard to establishing objectives for environmental initiatives conforming as closely as possible to Danish objectives.
- Development of the concept of "the environmental space" as an aid to illustrating the goals for initiatives in the environmental field.
- Continuing the work of generating data for and assessing the environmental and health-related properties of relevant chemical substances, both in Denmark and in international contexts. The existing basis of prioritising must be improved as regards the use of chemical substances and products. This initiative is described in more detail in "Chemical substances - Status and Perspectives".
- A corresponding effort to generate more data for use in further developing criteria for prioritisation for a series of renewable and non-renewable resources and for the issue of biological diversity.

7.4 Access to knowledge

Action requires knowledge

The stakeholders can only include considerations of environmental properties for the products, which they manufacture, buy, sell or dispose of, if they have access to the necessary information. At present, no systematic information is available on the environmental properties of products. Neither the consumers nor the professional stakeholders have easy access to credible, necessary or adequate environmental information.

Existing knowledge inadequate

There exist only a few mandatory declaration systems for the contents of particular chemical substances, but there is no general obligation to pass on environmental data. The voluntary disclosure of environmental information is unsystematic and virtually chaotic. Individual stakeholders generally pass on only what is in their own interest. There are very few frameworks for the scope and quality of the information to be disclosed.

However, the Danish Consumer Ombudsman's rules for environmental praises do constitute an initial step in this direction.

In this light, the Danish EPA has proposed that the generation and dissemination of knowledge about the environmental properties of products are centrally represented in the Danish product initiative.

Stakeholders should contribute their know-how

Any stakeholder involved in the life-cycle of products should produce and pass on such environmental information as is needed by the other stakeholders, the stakeholder in question being the party best equipped to generate and pass it on. The long-term goal should be to develop a coherent "self-declaratory" system in which relevant knowledge of the environmental properties of products is passed on by everyone obtaining and gathering it. At the same time, anyone purchasing raw materials, semimanufactures or products should require information on their environmental properties.

Prioritised environmental and resource problems are the basic areas in which knowledge should be disseminated. However, this does not establish the degree of detail needed for the information.

Information must be adapted

The various stakeholders do not have the same need of information; nor do they have the same facilities for generating, disseminating and understanding the environmental information involved. A consumer who takes an article off the supermarket shelf does not normally need to understand every detail of the environmental properties of the article while a purchaser for a nation-wide grocery store chain, which stocks the item on its shelves, should be more qualified. In the same way, the product developer must have access to highly detailed environmental information. It is therefore necessary to develop a differentiated information strategy that takes these differences into account.

Information should be in demand

On a day-to-day basis, the individual stakeholder is confronted with an enormous flood of information - including information on environmental problems. It only makes sense to contribute additional environmental information if the stakeholder requires or can be made to require such additional information. If the information is not wanted, it will drown in the flood of data or will be actively weeded out.

Manufacturers and importers responsible for product knowledge

Basically, responsibility for direct information on the environmental impact of products during production, use and disposal should rest with the manufacturers and importers. But subsequent links in the chain must also assume responsibility for receiving and passing on that information.

Much environmental information is not available in any systematic form today and can be expensive to provide.

It is proposed gradually setting up a proper duty to inform in close co-operation with the market stakeholders, giving reasonable warning and allowing for confidential information or information sensitive to competition.

Existing and new instruments

Existing instruments which it is proposed to adjust and consolidate: Voluntary, publicly accredited labelling schemes, product comparisons with environmental information, environmental guidelines for public purchasers, methods and tools for use in developing less environmentally degrading products and environmental management.

New instruments to be considered: Voluntary environmental product declarations and environmental user instructions, establishing an organisation to accumulate knowledge in the field and establish a duty on the part of manufacturers and importers to inform the consumer - e.g. through wholesalers and traders.

Table 7.2
Overview of who is to provide what types of information to whom

From/to	Manufacturer	Trade/import	Consumers	Know-how producers	Authorities
Manufacturer	Environmental product declarations	Environmental product declarations Eco-labelling	Eco-labelling Environmental product declarations Instructions Compulsory consumer information	LCA data	
Trade/import		Environmental product declarations	Environmental product declarations Eco-labelling Instructions	LCA data	
Green organisations		Product comparisons	Product comparisons Information on eco-labelling		
Know-how producers	LCA data and tools	LCA data and tools		LCA data and tools	LCA data and tools
Authorities	LCA data and tools International standards Priorities Information on eco-labelling	Environmental purchasing guidelines Priorities Information on eco-labelling	Product comparisons Information on eco-labelling	LCA data and tools Priorities	Environmental purchasing guidelines Priorities

The following descriptions of the information outlined in the above table have been arranged according to the stakeholder who they are targeted, in the sequence: private and professional consumers, distributors, manufacturers and authorities. Within each group, mention is first made of instruments based on voluntariness, then instruments which it should be considered making mandatory.

Voluntary, publicly accredited eco-labels

Unambiguous information on the best products

A voluntary, publicly accredited eco-label must be a label allocated, on application, to products in a product group meeting publicly approved criteria - and thus having improved environmental properties. Consumers thus receive unambiguous information on which comparable products are the least environmentally degrading.

Effect of the label

To the degree that such labelling influences the choice of consumption, it will not only directly reduce the environmental impact but will also act as an incentive for producers to develop and manufacture products with less environmental impact. The fundamental prerequisites for success are: 1. The manufacturers see the advantage of applying for the label. 2. The consumers have faith in the labels and demand eco-labelled products. 3. The scheme is so dynamic that it creates serious pressure for changes.

Eco-labelled products in essential product groups

The long-term vision for eco-labelling is to have eco-labelled products on the market within all essential product groups. The Danish EPA will carry on the work of promoting eco-labels on a number of different fronts.

Revising the EU eco-labelling scheme

The Danish EPA is taking an active part in the revision of the EU eco-labelling regulation, and Denmark is working to organise its criterion development work more effectively. The scheme should also be made more attractive by creating a better link to the environmental activities of the companies generally. Here, Denmark has proposed that the manufacturers should be able to benefit from being certified under an international environmental management system such as EMAS or ISO. However, it must be expected to take several years before this label gains wider acceptance.

A larger number of eco-labelled goods

The number of eco-labelled goods on the Danish market should be increased as quickly as possible. On the short view, this can only be done by Denmark acknowledging one or more of the existing national or regional labels. As recommended by the consumer organisations and the

green organisations, a.o., Denmark should therefore join the Nordic eco-label, the Swan.

Collaboration with national eco-labelling schemes

The Danish EPA will take the initiative to co-operate with some of the national eco-labelling schemes. The already existing co-operation between half of the national labelling schemes can be used as a basis. Above all, this co-operation can be used for enhancing the influence of the EU regulation though it might be expanded to include a greater degree of teamwork on criteria development and possible accreditation of the labels in Denmark.

In this connection, however, it is very important to avoid confusion arising among consumers as to which eco-labels they are to base their choice of product on. Similarly, work should be done to co-ordinate the other labels offering information on the environmental and energy credentials of products so as not to send conflicting or confusing signals onto the market.

Support to initial applicants

The Danish EPA will consider the possibility of supporting companies applying for the label. Alternatively, a kind of prize scheme may be set up awarding the first applicants within each particular product group.

Prioritising the establishment of an ISO eco-labelling standard

Finally, high priority should continuously be given to the work of establishing an ISO standard for eco-labelling. The Third World and the USA regard eco-labelling as a technical barrier to trade and are thus demanding full consensus between all parties involved in developing the criteria. If this attitude is victorious, product eco-labelling will no longer be a practicable prospect. Given that, under the WTO agreement, the ISO standard will also need to be adopted in Europe, this is a very important area of action.

Environmental product declarations are an extension of the eco-label

Environmental product declarations and consumer instructions

Environmental product declarations for the consumer are an extension of the eco-label. In simple and plain form, it will be capable of describing the most essential and relevant environmental information. It may, for instance, take the form of an index and include, e.g., energy consumption during the operating phase, disposal problems and the content of xenobiotics included on the List of Undesirable Substances.

The present compulsory energy labelling of kitchen hardware is an example of a simple index that provides simple information on one of the most significant environmental properties of the product. The declaration can supplement the eco-label and enable interested consumers to weigh up the various environmental properties.

Environmental user instructions

The concrete use, maintenance and disposal of a product can mean great differences in environmental impact. It may therefore be essential to inform the consumer about the correct or least environmentally degrading form of behaviour.

For durable goods, which are often accompanied by technical instructions, information should be provided on the most environmentally sound way of using the product. In some areas, a broader public information campaign in the form of e.g. teaching materials or TV spots may yield good results. Such initiatives can be free-standing or form a supplement to environmental user instructions.

For selected product groups, it is proposed to develop concepts for environmental product declarations and environmental user instructions, respectively.

Product comparisons

The environmental parameter must be evaluated alongside other parameters

Implementing and publishing product comparisons, in which environmental properties are assessed alongside other factors, may create a greater demand for less environmentally degrading products.

Product comparisons and tests can also contribute to piercing any myths that may exist about the inferior quality and poor usage characteristics of environmentally sound products. Finally, such product comparisons can ensure that the environmental parameters of products are brought into focus with the manufacturers on the same level as parameters such as quality and price. Great efforts in this field are already under way by both the Danish Consumer Council and the National Consumer Agency of Denmark so there is no need for new institutions in the field. However, the problem of ranking and formulating environmental properties more firmly in comparative contexts should be examined.

Compulsory consumer information

Consumers entitled to information

One of the baseline references for product initiative should be the consumer's entitlement to whatever information he or she finds relevant and necessary in choosing and using a product. Consideration should be given to supplementing voluntary information with compulsory labelling in fields in which voluntary information cannot be made to function satisfactorily.

Compulsory labelling

In general, compulsory product labelling could be used for ensuring consumers access to information on product properties and any use requiring special alertness.

One starting point for the compulsory labelling of products in any product initiative might be the "List of Undesirable Substances", for example, as well as the other environmental and resource problems described in Section 7.2. Examples of labelling requirements might be the content of heavy metals or hormone-like substances, or information on the quantity and nature of recently extracted resources used in the product.

Any action taken to widen the field of compulsory labelling will need to conform to the EU regulation on hazard labelling, restrictions on use and the approval schemes for a series of product groups.

Labelling only if relevant in recipient country

Owing to the WTO rules, compulsory labelling can only cover environmental factors of relevance to the recipient country. With the present WTO rules, this presumably means that information on resource consumption and impact during manufacturing cannot be made compulsory requirements.

Conversely, it will be possible to make requirements concerning information on the properties of the actual product, both when being used and when being disposed of. In selecting compulsory parameters, the emphasis should thus be on the needs arising from specific environmental problems in Denmark, such as xenobiotics in sewage sludge, groundwater contamination and problems related to disposal.

Some general legal provision may be needed

Consideration should be given to introducing general legal provision in the Danish Environmental Protection Act to impose a duty on market stakeholders to produce and pass on essential information on the environmental properties of products.

Environmental guidelines for purchasers

In co-operation with a number of stakeholders, the Danish EPA is in the process of elaborating environmental guidelines for professional purchasers - so-called purchasing guidelines. These describe relevant factors to take into consideration and inquire about when buying environmentally significant products.

Help to ask the right questions

The intention of the guidelines is to have them act as a tool for guiding professional purchasers to ask the right questions and in that way influence suppliers to generate the requisite information. The guidelines must provide a better decision-making basis for the purchasers and at the same time influence suppliers to evaluate the environmental problems associated with their products.

Help to adapt to future product requirements

The purchasing guidelines are expected to have the positive side-effect of letting suppliers know beforehand what requirements may be made, enabling them to adapt to the new requirements in advance.

The active input of environmental information by manufacturers and importers can be instrumental in rendering the work of developing such guidelines considerably more effective. As a first step, negotiations will be ushered in with the relevant stakeholders, the aim being to create co-operation on the development and dissemination of guidelines for professional purchasers.

The guidelines will be further developed and systematised to ensure that specific information is present in a form that the purchaser can use for comparative purposes. It will probably be necessary to make different standards for different product groups as the environmental properties of the product groups vary.

Environmental data and assessment tools for product developers etc.

Data for use in product information and development

Manufacturers need to get access to environmental data or have such data developed for the substances and resources used in their products. The data are going to be used partly for informing stakeholders in the later stages of the product life-cycle about the environmental properties of the products, and partly in connection with product development.

Manufacturers also need tools that can use these data for estimating or calculating the central parameters describing the environmental properties of individual products.

Setting up a know-how centre

For many small and medium-size companies without great technical expertise, the task of establishing and maintaining such an underlying dataset is completely impossible. As most processes in a product life cycle are generic, it is neither necessary nor expedient to have the individual company set up its own underlying dataset. It will therefore be more sensible and rational to set up know-how centres and develop tools and databases for the use of manufacturers who have to establish the environmental properties of their products.

The EDIP method

As described in Section 4.3, the EDIP method has been developed in co-operation between the Confederation of Danish Industries, the Technical University of Denmark (DTU), five Danish companies and the Danish EPA. It involves a general method for supporting the integration of environmental considerations in product development. The provisional experience of the finished tool, which will initially be able to be used in the electromechanical industry, is promising.

Work is currently in progress to develop a PC tool that will make the method accessible to those companies that have some environmental know-how as well as some expertise in product development.

More, quality-assured data

To a far greater extent, initiatives should be taken to gather and quality-assure data on the environmental credentials of products. In this connection, it must be ensured that, whenever possible, companies and others report data from environmental assessments of products in the same format as EDIP data.

In addition, a series of environmental assessment projects should be initiated within various product groups - including textiles, foods and construction/dwellings. This will enable data in EDIP format to be collected for these product groups, and new areas of action to be designated. These may be particularly significant product characteristics or product types, semimanufactures or materials used in, e.g., different trades etc.

Commitment to ISO standard

Efforts should be made to monitor and influence the standardisation work of ISO. Standards should provide an opportunity to study the environmental assessments in depth, and work should be done to make sure that they can accommodate the existing EDIP method.

Simple environmental assessment tools

Finally, there is a general need to continue developing and adapting methods for the environmental assessment of products. Not least, simpler tools need to be developed on the basis of the EDIP method, which can be used for screening the environmental properties of products.

Methods that can propose alternatives

Few tools today can help the designer by pointing out alternative solutions that are better for the environment. Generally, there can be said to be a great need for developing design aids capable of actively proposing less environmentally degrading alternative solutions.

Environmental product management

Environmental management

Most environmental management systems today focus primarily on the direct environmental impact of the activities of the companies and only to a lesser extent on the environmental impact of their products. Such environmental management systems thus need to be further developed. Considerably more prominence should be given to life-cycle assessments of the products of the companies and to the systematic environmental requirements made of suppliers.

Methodological development and international efforts

Efforts should be aimed at influencing the international forums that draft the environmental management standards, i.e. primarily ISO and the European Commission. In addition, independent methodological development is needed in relation to life-cycle assessments and supplier management systems within the framework of such standards. Consultants and verifiers should receive further training in order to enable them to include such product aspects to a greater extent.

Overlapping data requirements and methods

Organising knowledge-building and information exchange

The data and methodological approach needed to develop products, environmental product declarations, eco-labelling criteria and eco-label usage evaluation are fundamentally the same. Consideration should therefore be given to establishing a common organisation capable of overseeing the entire development of the information aspect together with the collection and systematisation of data - including EDIP database maintenance.

Independence and presentation of interests

It is important that public authorities safeguard the independence of the organisation as well as ensure that there is no commercialisation of the field. It is equally important that broad-based representation of interests is linked to the organisation, not least to cement consumers' faith in the work.

Further, the organisation must function as a linkage between the various stakeholders. It must be ensured that stakeholders who can supply information actually do so, and that stakeholders who need information actually have their needs met. If the organisational set-up is that of an independent unit, the financing can be a mixture of a basic government subsidy, income from the eco-labelling scheme and fees for data used by companies and purchasers.

International agreements

Disseminating information to the environmental authorities of other countries

It is essential for the national environmental authorities to support one another with knowledge relating to international product regulation. A number of international agreements currently exist, restricting trade in hazardous products and wastes. The main purpose of these agreements is to protect the developing countries. These include exports of certain chemical substances and the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal. Accordingly, Denmark is the first country in the world to have introduced an environmental information procedure for the export of used industrial plants.

The work of expanding international information on the environmental properties of products should form an integral element of the product-orientated environmental initiative.

7.5 Developing a stable market for environmentally sound products

Efforts to create greater and more stable demand for environmentally sounder products must concentrate in particular on promoting consideration for the environment in public purchasing. Another instrument in this context is green taxes.

Eco-conscious procurement policy in the public sector

An important customer and stable demand

Today, the public sector in Denmark constitutes a very considerable and fairly homogenous clientele in a number of product areas. The public sector spends more than DKK 90bn a year.

The long-term goal is to have the public sector take all areas of the environment and energy into consideration in its purchases of goods and services, alongside other determinants like price, function, quality, working environment and terms of delivery. In this connection, long-term procurement policies are important signals to manufacturers wishing to supply a stable future market for environmentally sound products.

Interacting with eco- and energy-labelling schemes

Environmentally conscious purchasing in the public sector is also of great importance to other initiatives described in this proposal. Industrial interest in positive eco-labelling can be strengthened by the demand from public-sector purchasers for products conforming to the criteria for accredited eco-labelling. Likewise, the effect of the energy-labelling scheme within the EU could be strengthened by public-sector purchasers demanding products in the best categories.

Barriers to eco-conscious public-sector purchasing

The most important barriers to a pronounced improvement in eco-conscious public-sector purchasing are lack of knowledge and tight budgets. Moreover, the EU procurement regulations may constitute a barrier in the long term. The prerequisites for the public sector's general acceptance of environmental considerations are, on the one hand, continued and extended dissemination of environmental knowledge to the purchasers and, on the other hand, genuine motivation on the part of the purchasers to make environmentally sound purchases.

The greatest obstacle to this motivation is that genuine environmental considerations will in most areas result in greater expense - at least until

there is a solid market for the new products and the organisational running-in period has been completed.

Subsidising the introduction of less environmentally degrading products

It is therefore felt that the best way to promote a satisfactory volume of eco-conscious purchasing in the public sector would be to subsidise the introduction of new less environmentally degrading products. This might take the form of a new subsidy on cleaner products, e.g..

Criteria for including the environment in purchasing and procurement

EU rules on public procurement allow a national commitment to be made to soliciting bids exclusively in a manner that allows environmental considerations to be included when evaluating incoming bids. Consideration should be given to how this possibility can be utilised, and to what extent.

Moreover, Denmark is working to expand and specify the possibilities for including environmental and energy conservation considerations throughout the product life-cycle by tendering with reference to the EU Public Procurement Directive.

Action plan for public-sector green procurement policy

The Danish EPA will follow up the action plan for a green public procurement policy with active support in years to come. Provided it receives some backing from the results of the two-year registration scheme for public-sector purchases of environmentally less degrading products (to be implemented in 1997), the Danish EPA will suggest laying down goals for governmental purchases of less environmentally degrading products within selected product groups.

Moreover, the Danish EPA will discuss the possibilities of registering local authorities' purchases of less environmentally degrading products with the relevant organisations.

Eco-conscious EU procurement policy

Efforts in Denmark must be supplemented with major international initiatives in order to put eco- and energy-conscious purchasing policies onto the agenda of the EU and other member countries. The objective should be to get the European Commission to implement an eco-conscious procurement policy and to get member states to draw up action plans, objectives and initiatives that commit them to eco- and energy-conscious purchasing in the public sector.

Green taxes

The analyses and round-table discussions point to green taxes as an important instrument in enhancing the conditions of competition for products with improved environmental properties. Green taxes interact with other means to control the market for less environmentally degrading

products, assuming that they are appropriately designed by including input from the relevant stakeholders. The work of elaborating useful green taxes should therefore be continued.

It is important to make sure that there is no deterioration in the international competitiveness of Danish producers, that taxes are reasonably manageable, and that taxes provide a real incentive to demand or produce less of the taxed product. The effect depends not only on the size of the taxes but also on a series of other factors such as the scope for finding alternative, cheaper solutions.

The question of the impact of green taxes has not been treated in-depth for the purposes of this proposal as it is given thorough treatment in other contexts, for example /25/.

Green taxes on products

The catalogue of Danish environmental taxes includes examples of taxes on raw materials, products, environmentally hazardous substances and waste products. In a limited market, specific product taxes or taxes on products containing environmentally or health hazardous substances can have a relatively effective impact on consumer choices - without distorting competition.

Taxes on products and on environmentally and health hazardous substances have been introduced to limit the amount of waste through increased recycling or to avoid nasty substances in the waste flow. In the case of taxes imposed on resources or raw materials, problems may arise to a far greater extent if taxes do not exist on all significant markets or there is no appropriate recycling of the tax money involved.

The design of the taxes must fall within the parameters of the WTO and EU regulations. As a rule, this will mean that it is not permitted to discriminate against imported goods except when the aim is to protect the environment of the country in question.

New taxes in interaction with other instruments

No specific new taxes are suggested in connection with this proposal. However, given the need for financial motivation in connection with any product initiative, the possibility of using new taxes together with other means must be evaluated not only in more general terms but also in relation to the concrete new initiatives towards selected products, materials or chemical substances.

7.6 Initiatives in three product areas

Basis of product-specific initiatives

Initiatives within certain product areas must take as their point of departure the specific business and environmental conditions associated with the product areas in question.

Each product area is characterised by different business conditions, existing competence and organisational relations. Similarly, the role and contribution of the various stakeholders will differ from one product area to another. The Danish Ministry for Business and Industry's resource area analyses throw light on a long series of such interrelations.³ Different stakeholders will be central to, and different control instruments more effective in, initiatives in different product areas.

Value of efforts in specific product areas

The cross-cutting initiatives described in the preceding sections must therefore interact with initiatives in selected product areas. In this way, real results and experiences can be created.

Selecting three product areas

The Danish EPA proposes that initiatives should initially be implemented in three product areas: textiles, electronics and transportation of goods. These areas have been selected for their relative profusion of documentation, the considerable amount of related production and demand in Denmark, and because they represent a series of important aspects of relevance to the product initiative.

Subsequent selection of additional product areas

It is intended to implement further initiatives in selected product areas within a couple of years. The areas in question might be, for example, graphics products, construction materials such as windows and floors, or pork.

Taking the experience already gathered as a basis, the long-term intention is to implement similar initiatives in the most important product areas. The relevant product areas must be selected, i.a., on the basis of analyses of the environmental and market conditions governing the various sub-areas under the Ministry for Business and Industry's resource areas. As described in Chapter 5, these resource areas represent a division of Danish trade and industry along the lines of cognate product groups, cutting across traditional sectors. The action to be taken in the three product areas selected is detailed in Appendix 3.

Organising initiatives within product areas

Entire life-cycle and all stakeholders

The action taken within each product area must be based on all initiatives in the area, both past and present. As a point of departure, all phases of the life-cycle of a product must be included. It is proposed having all relevant stakeholders participate in a binding form of collaboration.

Product-area panel

It is suggested that the liaison work and hands-on management for initiatives within each particular product area be carried out by a "product-area panel," consisting of all relevant stakeholders in the area. Each panel must be constituted as a project organisation. Appropriate secretarial support facilities should be attached to each panel, to be overseen by the Danish EPA. Leadership should be placed in the hands of one of the significant stakeholders in the area. It should be possible to adjust the make-up of each particular product-area panel to each specific task by involving new stakeholders.

Participating stakeholders

As a basic starting point, the following stakeholders ought to be represented:

- Companies, to be represented by both individual enterprises and trade associations and unions. All parts of the value-adding chain as well as suppliers of equipment and auxiliaries must be covered.
- The retail trade, to be represented by relevant trade organisations and unions.
- Consumers, to be represented by consumer organisations and green organisations.
- Relevant government authorities.
- Local authorities, to be represented by individual counties and municipalities as well as the National Association of Local Authorities in Denmark (KL) and the Association of County Councils in Denmark (ARF).
- Relevant experts and consultants.

Active participation required

The active participation of all groups is a prerequisite for success. Supporting the participation of financially weak stakeholders in the work will therefore be considered under the Danish EPA's proposal for a new subsidy scheme.

Mapping out significant conditions

The first part of the work consists in mapping out conditions of major significance to product activities. Among other things, this survey must clarify what points need to be tackled from an environmental and market parameter angle, who are the most important stakeholders, what market factors are decisive, and which particular initiatives are possible in relation to the product group in question.

Drawing up an action plan

The survey must contribute to the drafting of an action plan for the product area, defining environmental and market objectives for that area. Following on from these objectives, the action plan must outline each particular initiative and the tasks of the individual stakeholders. The action plan can also be instrumental in translating the proposals into initiatives such as labelling, eco-conscious purchasing and usage controls.

Plan should be binding

It should be endeavoured to make the action plan binding in nature, by a series of obligating agreements between the participating stakeholders. This will provide greater assurance of the various initiatives being carried out.

Proposals and initiatives for textiles, electronics and transportation of goods

Characterising the three product areas

The three areas have significant but different degrees of impact on the environment, and function under highly disparate trade and marketing conditions.

Together, they are thus reflective of much of the diversity that will generally have to be included in the product initiatives with reference to objectives, instruments and the significance of different groups of stakeholders. Moreover, these product areas have been selected because of the progress made on such environmental activities and/or because they have central stakeholders who are felt to be willing to take a front-seat position where such action is concerned.

The tables below illustrate the difference between the product areas selected in terms of both their priority environmental problems and their financial importance.

Table 7.3

Global environmental problems of relevance to the proposed product areas

	Energy	Xenobiotics	Biological resources	Mineral resources
Textiles	X	X	X	
Electronics	X	X		X
Transportation of goods	X	X		

Table 7.4

Key financial figures for Danish manufacturing companies in the product areas

	Turnover (DKKbn)	Employment (1,000)	Resource area
Textiles ¹	15.7	18.0	Consumer goods
Electronics ²	25.9	24.6	Communications
Transportation of goods ³	24.6	22.5	Transportation

Source: 1996 Statistical Yearbook

1) Textiles and clothing

2) Computers, electrical motors and telecommunications equipment

3) Hauliers

7.7 Product development support

The initiatives, which it is proposed implementing in connection with intensified product initiatives, will require both financial and other resources. In many cases, the cost of these acts as an actual barrier to product initiatives. It is therefore proposed to establish a subsidy scheme for the development and marketing of products with environmentally improved properties.

The scheme must be able to support activities within all main areas of the product initiatives - including knowledge-building and dissemination, product development, marketing of products with environmentally improved properties, and the development of systems for disposal and recycling. The support scheme will conceivably be co-ordinated with the financing facilities available under the Danish Ministry for Environment and Energy and other ministries.

Objective of the subsidy scheme

The new subsidy scheme ought to be able to operate with the same objectives as the three existing subsidy schemes for the development of cleaner technology, environmental and working environment management in small businesses, and disposal and recycling.

In the view of the Danish EPA, however, the new subsidy scheme should place greater emphasis on support initiatives focusing on the environmentally significant areas of product life-cycles. One innovative proposal suggests that support be offered to initiatives promoting the market launch of new products less degrading to the environment.

The overall objective of the subsidy scheme for cleaner products ought thus to be to promote the development, production, marketing and use of less

environmentally damaging products. The programme must focus primarily on a general framework for stimulating market stakeholders to devote on-going consideration to the environment.

Use of subsidy funds

On the one hand, this can be accomplished by subsidising improvements in the conditions of the companies for developing new, less environmentally degrading products. On the other hand, it can be done through grants to generate a qualified demand for cleaner products. By concentrating on development and marketing alike, a co-ordinated push-and-pull effect should be attainable, with regard to both businesses and the market.

The product impact must be considered for the entire life-cycle. From a life-cycle perspective, therefore, subsidy funds must be prioritised with an eye to achieving the greatest possible environmental benefit. As a starting point for specific projects, an analysis of the product or substance in question is needed in order to ascertain that the proposed project targets a significant environmental or resource problem, seen in the light of the entire life-cycle.

Similarly, the subsidy programme must function in concerted co-operation with future initiatives in the area of waste. This must be brought about by supporting waste reduction, ensuring product recyclability and reducing the impact of waste on the environment. As an extension of this, it must in future be possible to subsidise the ongoing development of broadly targeted disposal and recycling systems.

Division into four subprogrammes

It is proposed dividing the programme into four subprogrammes, corresponding to the following four dimensions:

- Product development subsidy - i.e. support for activities supporting development within specific product areas or widely integrating the environmental assessment of products, especially in the development strategies of smaller businesses.
- Market development subsidy - i.e. support for activities consolidating the use of less environmentally damaging products through the development and/or promotion of, e.g., eco-labelling, environmental product declarations, purchasing guidelines, and environmental management systems for dealers and purchasers in both the public and private sectors.
- Knowledge-building subsidy - i.e. support for activities able to generate, maintain and disseminate the know-how base for developing and

qualifying the demand for cleaner products. Educational initiatives will also be included.

- Subsidy for the waste area - i.e. support for activities able to develop and disseminate disposal and recycling systems, and able to generate know-how and statistics on the Danish waste flow.

It should also be possible to use the subsidy scheme for cleaner products to lend support to all phases of the product life-cycle and, in principle, support should be granted to all significant stakeholders in the market system. The subsidy scheme should function over a period of five years to make it sufficiently supportive of the kind of activities in question.

7.8 Banning the use of selected chemical substances

Environmental problems associated with the production, use and disposal of products have aspects that fall within as well as outside of the area suited to specific behavioural regulation. The development of new environmentally sound products and the consumer's choice of products are areas that typically fall outside. The use of certain hazardous substances in products and the disposal of such products after use fall within.

Regulation prioritised and supplemented with voluntary initiatives

If the use of substances hazardous to health and the environment is to be limited, there needs to be a voluntary effort, performed by relevant stakeholders out of an interest in showing consideration for the environment, coupled with mandatory environmental controls regarding what substances may or may not be utilised. Direct regulation of use is and must continue to be assigned top priority in the case of substances known to have a damaging effect on health or the environment.

Objectives

Long-term objectives for regulating the use of chemical substances and products include minimising the impact of chemical substances on humans and the environment during their life-cycle by reducing concentrations of such chemical substances in the environment as well as human exposure to them. At the same time, substances with a known and significantly deleterious effect on health or the environment must be prohibited unless it is deemed fit to permit certain uses of the substance.

Emphasis on international efforts

Public controls in the form of executive orders governing the use of such substances will largely be based on international efforts in the area, especially within the EU.

In the EU and other relevant international forums, Denmark will continue to promote regulations governing the use of the most problematic chemical substances and products. In this context, Danish industry will be able to play a significant role if it can demonstrate by example that problematic substances and products are dispensable.

Focus on product use and disposal

In conjunction with future product initiatives, the scene is set for improved regulation in areas where controls are the most effective and possibly only way of reducing the impact on the environment. The use of chemical substances that generate a major impact on the environment, either through the use of products or through their disposal, is one such area.

List of Undesirable Substances

The Danish EPA's draft "List of Undesirable Substances," mentioned in Section 7.2, shows those substances presently targeted for action or listed on the policy agendas of Denmark and the EU.

Moreover, a number of substances currently in large-scale use and considered to have particularly alarming effects on health and the environment will be blacklisted. Whether the use of such substances will be subject to regulations depends not only on the additional information produced on their properties and diffusion in the environment as well as EU evaluations and initiatives in the area but also on the possibilities for exploiting the Danish market.

Regulated use of 20-40 new substances

In the course of 1997, the Danish EPA expects to point out 20 or 40 of the substances on the list as special-priority chemical substances and subject them to closer scrutiny with a view to implementing regulation of their use.

There are presently three new Danish executive orders in the pipeline to significantly reduce the use of lead and lead compounds, ban the import and use of wood treated with arsenic, and prohibit the use of nonylphenol ethoxylates in detergents.

7.9 National co-ordination

Within the government sector, a number of instruments are being utilised with direct or indirect consequences for the development and use of products with improved environmental properties. This is true of the Danish Ministry for Environment and Energy's area of jurisdiction as well as that of other ministries.

Government activities must contribute to product initiatives

Many of these government activities make a constructive contribution to product initiatives. But there is far greater potential if only the environmental properties of the products concerned were to be consciously taken

into consideration. Work should therefore focus on co-ordinating the effect of all public initiatives of relevance to the product area so as to bring them into line with the proposed product action.

Environmental assessment of subsidised projects

The Danish EPA therefore proposes that the initiative be taken to introduce a more systematic environmental assessment of product development and corporate projects subsidised through various government schemes. The same is true in respect of grants associated with various research programmes. Where the necessary resources or know-now for such assessments are lacking, these must be earmarked.

Subsidy conditional on substitution

Moreover, state subsidies for private activities such as urban renewal must be made conditional on the avoidance of certain substances or materials when alternatives exist. This enforced demand will ensure substitution in an area where functionally satisfactory and environmentally superior alternatives exist.

Including the environment in standardisation work

In defining product and performance standards, procedures need to be established to ensure that various sectorial ministries include environmental considerations in their regulatory initiatives. Concurrently, environmental assessments should be included as required terms of reference for any standardisation work carried out under CEN.

Co-ordinating consumer information

Public-sector collaboration on consumer information - including labelling schemes - must also be strengthened. This can be done by means including co-ordinated campaigns in collaboration between the National Consumer Agency, the Danish Energy Agency and the Danish EPA.

Decentralised environmental authorities

With regard to the decentralised administrative bodies at local authority level, the focus needs to be particularly on the role of administrative authorities as macroproducers of services and on their scope for influencing product behaviour through purchasing, pricing, etc.

7.10 International efforts

Many relevant issues treated internationally

International relations are of quite major significance to the development of product-orientated environmental initiatives, both because a series of international agreements and regulations are in force in Denmark and because Denmark is involved in extensive international trade. Efforts to influence different international bodies and negotiating platforms are important, therefore.

Attempts should also be made to influence whatever product-initiative barriers either exist in international trade and standardisation agreements or are being considered.

In areas in which it leads the field in such efforts - e.g. in the product area - Denmark can provide a source of inspiration and act as an initiator.

Danish participation in the early phases of EU efforts

The EU has recently played an increasingly important part in international environmental collaboration. Attention should therefore be focused on EU institutions especially. Here, Denmark needs to co-ordinate its initiatives with like-minded European countries. It is important to be involved even from the outset of such efforts before ideas turn into proposals. The most important areas, in which ongoing action should be targeted at the Commission, are described under the various initiatives outlined earlier in this chapter. They are as follows:

Environment and trade

Environment and trade should be prioritised, not only because of the opportunities for continued development of product initiatives but also to ensure fair treatment of Third World countries in global trade.

Influencing conditions for standardisation efforts

Part of the standardisation work that is crucial if environmental considerations are to be included in future product development is the systematic lobbying of the 10,000 or so upcoming standards from the CEN with a view to implementing the Single Market. This will also affect the possibilities for introducing eco-labelling. A significant part of this effort will involve influencing the Commission with regard to its definition of demands and conditions governing standardisation efforts.

EU procurement policies

The EU Procurement Directive and internal procurement policy must be lobbied in order to make more room for environmental considerations in public purchasing.

Regulation of use

Regulations governing the use of substances hazardous to health and the environment have been fully harmonised. A consensus will therefore need to be reached with the Commission, both as regards joint regulations and possibly also special national regulations.

Nordic collaboration

At the initiative of Denmark and Norway, the Nordic Council of Ministers has set up a project group under Danish leadership to work on product initiatives. The group is to contribute to strengthening Nordic lobbying power in the halls of the EU, the international standardisation organisations and the WTO. Its first activities will be to influence the European Commission's work on green public procurement and the wording of a product-orientated environmental strategy for the whole of the EU. Furthermore, a

seminar will be organised in 1997 on the correlation between environmental and trade policy in association with the Council of Ministers' committees of senior officials for consumer and trade affairs.

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Appendix 1

Appendix to Chapter 6: Stakeholder descriptions

The stakeholder analysis in Chapter 6 is supplemented with further background material in the form of the following elaborative descriptions of a series of other stakeholder groups significant in terms of product-orientated environmental initiatives.

The aspects emphasised within each particular group of stakeholders are modelled along the following lines:

- Who is the stakeholder?
- How can the stakeholder influence the development and marketing of products with improved environmental properties?
- What is the visible consequence for the product initiative?

The following national and international stakeholders will be treated:

- A. Know-how suppliers
- B. The financial sector
- C. Counties and municipalities
- D. The government sector
- E. Multinational manufacturers
- F. Other nation states
- G. The European Commission

A. Know-how suppliers

Knowledge is decisive to several aspects of the various stakeholders' potential to contribute to the development and marketing of products with improved environmental properties. All stakeholders who work on the environmental properties of products accumulate knowledge of significance to such efforts.

Given the limited internal knowledge-building resources available to manufacturers, businesses and consumers, the knowledge generated in the environment surrounding the stakeholders and the dissemination of that knowledge are prerequisites to their ability to take adequate action in terms of their own interests in product-orientated environmental initiatives.

The groups of stakeholders considered under the heading of know-how suppliers are those whose chief importance to product initiatives is their development and procurement of the knowledge disseminated to professional as well as private knowledge-users. It is thus a highly varied group, spanning universities to daily newspapers, and one that cannot possibly be treated as a single entity with an eye to reaching an in-depth understanding of its conditions and activities. This section discusses the most important suppliers and disseminators of knowledge whereas Chapter 7 will describe specific knowledge dissemination efforts, present and future.

The group of know-how suppliers includes:

- Research and educational establishments
- Consultants
- The media

- **Research and educational establishments**

Universities and sectorial research establishments

Universities and sectorial research establishments receive a significant portion of public financing, and their operating parameters are largely defined by the relevant ministerial departments. Researchers focus on the development of their subject areas "proper" through the procurement of new knowledge in dialogue with other (international) researchers as well as, potentially, the primary users (from the business community) of knowledge in the area, who in some cases also contribute to financing certain activities. The results of publicly financed work usually become public domain. The universities, sectorial research establishments and trade-related centres of expertise also act as disseminators of knowledge by virtue of their basic-level teaching and further education of the labour force involved in product-related work. These institutions also offer consultancy in connection with other stakeholders' specific assignments.

Private research institutions

Certain trades (e.g. butchers/meat processing plants) fund their own research institutions or know-how centres. This model makes it possible to make rather more effective use of the resources spent on research and development by businesses in the sector - also in relation to the efforts of the sector on the international market. The research results of these institutions

are publicly available to the extent determined by those funding the activity.

- **Consultants**

Private consultants

Private consultants are both producers and disseminators of knowledge. The development and dissemination of knowledge by consultants is usually associated with specific client-defined assignments, and dissemination of the knowledge generated depends on the interests of the client.

Publicly funded consultants

The technological service system both develops and disseminates knowledge. This is publicly funded in part. It comprises both accredited technological service institutes such as DTI Environment, the Danish Academy of Technical Sciences (ATV) and dk-TEKNIK, which carries out consultancy and development projects for public and private clients, as well as local Technology and Information Centres (TIC), whose task is to advise small and medium-size businesses, e.g. by acting as guides to the additional consultancy available from the remaining GTS network (GTS - Approved Technological Service institutes).

- **The media**

Trade journals

The journals and newsletters of trade and other interest organisations generally enjoy high credibility with members and have a good background knowledge of the people receiving the knowledge to be disseminated. Moreover, they are able to use their narrow target group as a baseline on which to "tailor" information, avoiding irrelevant information.

Specialised environmental media

An example of an environmentally specialised disseminator is the Data Sheets from "Green Information"; funded by public means, this disseminates environmental information to the consumers.

Daily newspapers etc.

For all stakeholders, the general media - such as newspapers, television etc. - are the most significant vehicles of background knowledge on business and environmental issues. Together, they reach all the stakeholders and actually determine the proportion of knowledge acquisition not actively sought by the stakeholder himself. Thus, they are important partners in getting out to many stakeholders or in reaching stakeholders not accessible through other more specialised media.

Conditions and potential for influencing the environmental impact of products

Weak knowledge production

The Danish research institutions make a handsome contribution to the general expansion of environmental knowledge in the natural sciences. But in specific areas - the development of products with less environmental impact and methods for systematically taking on board environmental considerations in product development - the research institutions contribute markedly less. Today, the research institution where the most significant efforts within the environmental assessment of products takes place is the Technical University of Denmark (DTU). The "Development of environmentally-friendly industrial products" project represents the first step in this area.

Behavioural scientific insight into what moves the various stakeholders to implement product-orientated environmental initiatives and how the government might influence such conditions is an area where the production of knowledge is very scanty. Within the field of sociological environmental research and under the auspices of CeSaM^{*}, it has been attempted to integrate a series of disciplines with a view to attaining a greater understanding of the conditions governing the use and effectiveness of various means for any given behaviour, as well as a knowledge of the actual implementation of environmental policies. However, the Centre has not related its efforts specifically to the environmental impact of products. Moreover, work is being carried out in a series of other sociological research environments on various elements of the problem sketched above.

^{*} CeSaM: The Centre for Social Science Research on the Environment.

Limited knowledge on the part of know-how suppliers

Professional and specialist knowledge disseminators today have considerable insight into environmental conditions and technologies in general as well as some insight specifically relevant to work on the environmental properties of products. They usually have access only to the knowledge they themselves develop, along with publicly available knowledge. As there are very large areas of product areas that are not yet publicly accessible, the professional know-how suppliers' potential is correspondingly limited, of course.

The general know-how disseminators such as the media etc. - with the exception of certain journalists - are weak on environmental, technological and commercial knowledge. They are generally unknowledgeable about specific aspects of the environmental properties of products. The knowledge they are desired to disseminate must therefore be supplied in a form that is comprehensible to them and ready to use in their editorial line.

Consequences for product initiatives

It is important to involve the know-how disseminators and producers in a dialogue about the way product initiatives are organised; partly to incorporate the knowledge each party represents, but also to ensure their active support for further efforts.

Public funding is decisive for the production of publicly accessible knowledge and for the production of knowledge which there is no commercial interest in generating. In the context of overall research policy - including that of the strategic environmental research programme - thought must be given to whether it is possible to consolidate the production of that knowledge which is particularly relevant to product initiatives.

The feasibility of setting up a know-how centre should be considered - possibly one without walls - to gather information on environmentally oriented product development and marketing of products with improved environmental properties etc.

A media strategy should be devised, to include the supply of knowledge to the media, so as to support their dissemination of information related to product initiatives.

B. The financial sector

The development and marketing of products with improved environmental properties is dependent on capital supplied largely by the financial sector. The co-operation of the sector is therefore an important factor in product initiatives. And indeed, recent developments in the interest of the financial sector in general environmental issues augur well for positive collaboration.

The financial sector comprises approx. 1,000 businesses of various size and can be divided roughly into three separate function groups, namely investors, lenders and insurance companies /1/. The three function groups participate with the rest of the business community in financing and consulting businesses in different ways and with different objectives.

Investors

There are a great number of private investors whereas institutional investors are dominated by a handful of large ones. Together, the large institutional investors such as the suprasectorial pension funds, the Danish Labour Market Supplementary Pension Fund (ATP) and the Employees' Capital Pension Fund (LD) administer mammoth assets (DKK 130, 120, and 30bn, respectively). As the main parties interested in funding Danish trade and commerce, they have the opportunity to play a significant role.

There are certain pension funds and investment companies that have deliberately focused on developing more environmentally conscious companies, but environmental issues do not form a common feature of the investment assessments of the sector.

Lenders

There are some 150 Danish financial institutions, but it is a highly concentrated sector. Thus, the two largest banks represent half of the sector with respect to equity and balance-sheet figures. The twelve largest banks represent between 80 and 90%. The financial institutions perform a series of functions in connection with, i.a., savings and value storing, capital lending and banking and payment-handling services.

The mortgage credit sector is also characterised by a very concentrated business structure. The four largest institutions thus represent over 90% of

the market. Mortgage credit institutions play a well-defined but significant part in financing industrial property but their consultancy function is limited.

Insurance companies

The insurance sector is also very concentrated. In the sphere of general insurance, the ten largest companies represent over 90% of the balance-sheet figure. The insurance companies play an important role in insuring the securities and assets of the business sector. Claims worth approx. DKK 4bn/year are made good, and in some lines of business such as the automotive trade, these companies are very significant stakeholders and collaborators. Moreover, they furnish not inconsiderable amounts of loans and guarantees to the business community.

Conditions and potential for influencing the environmental impact of financial sector products

The financial sector has potentially great importance for corporate environmental initiatives. Through investment, lending and consultancy, financial firms can help modify the behaviour of all stakeholders whose accounts they handle. The sector can place stipulations on and/or call into question environmental behaviour/risks, policy and the inclusion of environmental considerations in management and product development. The past three years have seen a tendency to display greater interest in environmental conditions that can threaten the profitability of an investment or loan directly while broader interest in environmental issues with a potentially long-term impact is still to be seen. The challenge in planning product-orientated environmental initiatives lies in realising this potential.

Lenders play an important part in relation to small and medium-size businesses, which cannot raise capital by increasing their equity, issuing shares or suchlike. They must therefore obtain financing through borrowing. Likewise, the sector often acts as the only external consultant to small and medium-size businesses and thus plays a central role in communicating the objectives of a product-orientated environmental strategy.

The insurance sector plays several roles that may prove useful to the product strategy. The companies insure trade and commerce and therefore have the opportunity to insist on environmental ameliorations. In this context, it is judged that more rigorous and complex environmental legislation will mean that a number of businesses have to cover themselves, as well as

needing consultancy on environmental protection and the prevention of environmental damage. The companies can thus function as meaningful consultants for small and medium-size businesses in particular. Finally, insurance companies are large purchasers in certain lines, and as purchasers of goods and services can therefore make demands in respect of environmental properties.

Can the financial sector be expected to collaborate?

Sectorial support for the strategy is conditional on the assignments of the sector not clashing with the overriding desire to achieve a good return on investments, as well as the wish to avoid losses on loans and insurance. At the same time, it is in the sector's own interest to avoid bad press from, e.g., providing the source of financing for environmentally degrading activities. Parts of the sector can be expected to try and create a positive image by making environmentally justified demands in connection with their services.

Institutional investors are normally geared to long-term ownership. The close rapport between investors and company in the case of long-term investments means that investors have an intimate knowledge of the long-term development potential of the company and are interested in ensuring a sufficient financial foundation to guarantee that its developmental potential is fully exploited. Institutional investors can therefore be expected to have a great interest in procuring information on the environmental properties of products and hence on the long-term conditions governing development for the producers in whom they wish to invest.

Short-term investors seldom have this kind of knowledge about businesses. As a rule, they will only be interested in environmental issues to the extent that they affect the immediate solvency of the business.

Today, companies in the financial sector have a considerable knowledge of business relations and little or no knowledge of environmental factors or the importance such factors may have for the interests of financial concerns.

In the area of education, the financial sector is characterised by being fairly isolated from other sectors of society. The financial institutions have their own educational system (the Finance, Education and Training Programme and Banking Diploma studies), and many from the sector are also pursuing advanced degrees in commerce (HD). Generally speaking, it is problematic that the educational system in the financial sector focuses on concrete

banking affairs and only to a lesser degree on more general business relations - including environmental issues. The sector is poorly equipped to evaluate innovative projects, the emphasis being on more traditional financial criteria. Thus, social developments that could turn an innovation into a financially sound idea are not taken into consideration. The education and further training of employees in the insurance sector takes place mainly at the Danish Institute of Insurance Education, which is an independent, non-profit institution. The current training programme for financial and investment personnel does not touch on environmental issues.

During the round-table discussions, the representatives of the financial sector expressed the view that their companies are not competent to provide appraisals or consultancy on environmental issues. There is, then, a great need to develop tools that will allow some environmental angle to be included. The further development of green accounting focused on products will surely contribute to the future inclusion of environmental data on products in the standard information required for decision-making related to investments/lending etc.

Consequences for product initiatives

It has been difficult to obtain the desired degree of financing for new projects - e.g. product development - from parts of the business community, especially the small and medium-size businesses. It is therefore important for the product strategy to contain elements that guarantee businesses wishing to develop and introduce products with improved environmental properties access to financing. Tools must be created to reduce the risks of the financial sector in such projects. The support of the financial sector for product activities requires a positive correlation between the product activities of the companies and their ability to honour their commitments to investors and lenders.

It is important that the financial sector should be able to acquire the necessary competence in environmental issues. This will need to be done primarily in the form of efforts aimed at education and further training within the sector.

C. Counties and municipalities

Taking a number of their functions as a basis, the counties and municipalities can make a positive contribution to product-orientated environmental efforts. This is particularly true of the following activities:

- The production of welfare services and supplies
- The authorities' efforts pursuant to the legislation on environmental protection and planning
- Work on local Agenda 21 and other similar initiatives.

Production of welfare services and supplies

In terms of both finances and employment, the counties and municipalities contribute greatly to the local communities. Counties and municipalities are the dominant stakeholders in relation to the production of welfare services as the bulk of services within the social sphere as well as education and health are handled by the local authorities.

The goods purchased by counties and municipalities in the welfare services field total more than DKK 30bn a year, making them a very significant buyer in combination. Purchases consist of more or less standardised products such as foodstuffs and furniture etc. as well as specialised equipment, particularly within the health sector.

In supply terms, the counties handle operational and planning projects for the areas of roads, sewage and waste disposal. To a certain extent, the execution of projects in these areas is farmed out to municipal partnerships or private businesses. In the water, heat, gas and power field, supplies are provided to a greater degree by independent suppliers, though in many cases they are influenced by municipal interests. The county supply services include the road network and a series of planning projects, particularly in the area of water supply.

Environmentally, these supply projects are of considerable importance. The field of waste and sewage disposal, especially, requires distinct attention as planning in these areas is decisive to the disposal phase of virtually all products. Efforts in this area are treated separately in the Industrial Waste Strategy, the Wastewater Report and the Domestic Waste Plans.

Urban renewal and all publicly subsidised construction projects are another area in which the counties play a particularly important role, and one where they can exercise great influence on product choice and project implementation by laying down project conditions.

Conditions and potential

Taking the large purchasing volume of the counties and municipalities into consideration, they comprise a major cornerstone in the development of green public procurement policy. In this connection, it is imperative that they be provided with sufficient environmental information to enable them to make qualified choices in purchasing situations.

In order to create a link between budgetary accountability and consumption, i.a., many counties and municipalities have recently decentralised purchasing from central buying functions to individual decentralised institutions. This decentralisation often entails a lesser degree of specialisation for the purchasing function; all other things being equal, that makes greater demands in terms of the availability of environmental information.

When it comes to motivating individual institutions, one of the important factors in this context is the need for local authorities to communicate clear political signals and financial guidelines regarding environmental priority-setting in connection with purchasing.

When purchasing specialised equipment within the health sector, e.g., there is relatively close collaboration between producer and buyer. As an extension of this, it is possible to identify a definite potential for the implementation of development contracts with environmental dimensions. Similar conditions apply to the supply area in which many of the orders - within the parameters of the EU Public Procurement Directive - are likewise placed in close collaboration with manufacturers.

In public-sector terms, Indkøbs Service A/S is a significant stakeholder as a negotiator of purchasing agreements. Indkøbs Service A/S may eventually play an important role as a trend-setting purchaser positioned at the leading edge with regard to articulating demands in terms of the documentation needed for the environmental properties of the products.

The stipulation of general environmental demands in connection with suppliers' purchasing and utilisation of various kinds of product has a clear and unambiguous effect on subcontractors, owing to the status of these enterprises as sole customers. This is true, for example, in the production of asphalt of which counties and municipalities are far and away the principal customers. This market situation is reinforced by the fact that the counties are part-owners of one of the production companies in the area.

In relation to waste and sewage disposal, there is also some potential for creating differential rates and payment structures. That potential may motivate the use of products with a lesser environmental impact.

Demands concerning product assortment and environmental management in publicly subsidised construction projects will be of great significance to product development throughout the construction field.

During round-table discussions, support was voiced on the part of the counties for including environmental issues in all county activities to a greater extent - especially in the operation of supply companies.

The authoritative role of counties and municipalities

The responsibilities of counties and municipalities as environmental authorities in their dealings with the corporate and agricultural sectors centre around regulating the environmental load generated by businesses during the production phase of product life-cycles by means of the conditions stipulated in environmental approvals, directives etc. Added to this are the general provisions laid down by the counties in regulations and guidelines, usually aimed at regulating the disposal phase. In connection with the exercise of the authorities' functions, these are often supplemented with various forms of informative instruments.

Conditions and potential

In terms of reducing the environmental impact of the manufacturing phase, the counties and municipalities will continue to play a major part by regulating direct emissions and through their dialogue with companies on the utilisation of the cleanest technology possible.

In the broader sense, the informative instruments are one of the primary means available to counties and municipalities with respect to a product-orientated environmental strategy. The xenobiotic substances found in the sludge from a sewage disposal plant will largely have been bought and used in the area surrounding the plant by residents or public and private businesses. Thus, local action can have a clearly visible effect on local environmental conditions. With information campaigns and other Agenda 21 activities at local level - targeting businesses and individuals alike - it is possible to focus on the use of specific products at the root of local environmental problems related to, e.g., the spreading of sludge, recycling of waste products or the recovery of clean drinking-water.

At the round-table discussions, the counties and municipalities expressed a great and positive wish to help inform businesses about the basics of product life-cycle assessment and to make active use of these basics in the dialogue with the businesses.

Consequences for the product initiative

It is important to actively involve counties and municipalities in product-orientated environmental initiatives in their capacity as suppliers, environmental authorities and initiators in business promotion and Agenda 21 activities.

Political and financial support will be required to actually activate the potential inherent in taking the environment on board in local authority purchasing.

Moreover, increasing the use of less environmentally damaging products in the fields of supplies and social services requires a generally higher level of knowledge as to which products have less of an impact. In relation to the purchase of standard goods, the emphasis needs to be on user-friendly purchasing guidelines for institutions etc. In relation to the purchase of specialised goods, the emphasis needs to be on the buyers' general level of knowledge and on implementing development contracts for less environmentally degrading products.

In relation to local use of a series of products containing environmentally burdensome substances that entail problems for waste and sewage plants, the municipality can play an active informative role by seeking to reduce local use of such substances.

Dialogue should be initiated on ways in which urban renewal and publicly subsidised development projects can increase the inclusion of environmental considerations in planning, product choice, execution and management.

D. The government sector

Naturally enough, the product-orientated environmental strategy takes its point of departure in the Danish Ministry for Environment and Energy's purview. Other segments of the government sector also have a strong influence on the parameters governing product development and consumption,

however, and therefore play a significant part in creating incentives for increased development and the use of less environmentally harmful products. In relation to consumers, the government exercises rather less influence over the conditions on which consumers purchase less environmentally burdensome goods. Integrating the product-orientated environmental strategy with the policies of the other sectors is therefore of great importance, as this will ensure that environmental considerations form a major constituent of those sector policies that influence the development and use of less environmentally damaging products.

There is a certain, albeit limited degree of co-ordination between different initiatives today, and activities that appear uncoordinated or actually contradictory are regularly criticised. Purchases of materials for large infrastructure projects, so frequently highlighted, might be mentioned - with varying degrees of justification - as an example of a public purchasing policy that fails to take the environment into consideration.

Further to this, the Danish EPA has examined other areas of activity within the Ministry for Environment and Energy as well as questioning other relevant ministries and agencies about ways in which they can contribute to supporting the development and use of less environmentally damaging products. The following section on the government's role as a stakeholder in relation to the product-orientated environmental strategy has been elaborated on the basis of the responses from individual ministries and agencies. The following classifications will be used for the most important governmental control instruments directly influencing the development and use of products:

- PRODUCT-ORIENTATED RESEARCH AND DEVELOPMENT
- PRODUCT REGULATION AND THE DEFINITION OF NORMS AND STANDARDS
- OFFICIAL CONSUMER INFORMATION (LABELLING SCHEMES)
- GOVERNMENT DEMAND
- MANPOWER EDUCATION AND TRAINING

There is also the fiscal aspect in the shape of government taxes, rates and dues, which naturally comprise a significant parameter, especially as regards the consumption of products. Taxes, rates and dues as a means of promoting cleaner products are not the focus of this report, but are discussed briefly in Section 7.5. It should be noted that the government's sectorial planning and infrastructural investments in the areas of e.g. traffic and telecommunications indirectly influence the production and consumption of products. It lies beyond the scope of the product-orientated envi-

ronmental strategy to offer a description of these rather indirect means of control.

The aim of the following description is to show on the one hand that extensive and ongoing activities are in progress in many parts of the government sector, and on the other hand to emphasise the need for intensified intersectorial dialogue. The different ideas presented in the paper of various activities and their consequences for the product initiative should be seen as a constructive contribution to these discussions.

• **PRODUCT-ORIENTATED RESEARCH AND DEVELOPMENT**

A number of Danish ministries administer schemes that support corporate R&D activities in the product area. These schemes focus on promoting various politico-commercial and/or sector-specific objectives, in part through direct grants and loans to businesses, in part by financing various kinds of R&D-orientated projects and institutions. First and foremost, it is the Ministry for Business and Industry, the Ministry of Agriculture and Fisheries, and the Ministry for Research and Information Technology who are in charge of these activities. The other important stakeholders include the Ministry for Housing and Building, the Ministry for Environment and Energy, and lately also the Ministry for Labour, which - in order to promote certain sector-specific goals - is offering various kinds of support to R&D-related objectives.

The **Ministry for Business and Industry's** schemes can be divided into general business promotion and subsidies to individual companies. General business promotion includes regional commercial development and export promotion. Subsidies to individual companies include support for know-how and quality development projects, start-up assistance for entrepreneurs, "ice-breaker" schemes for small companies, and project support through the Danish Fund for Industrial Growth. Some activities have a certain environmental objective, but by far the majority focus on general commercial promotion.

One thing common to all the tools for general commercial promotion is that environmental considerations are only included to a very limited extent in the evaluation of individual projects. Projects or initiatives with environmental dimensions are, however, eligible for support on an equal footing with other marketing, competence and product development projects. Thus, environmental concerns are not factored into the evaluation of the performance of the participating companies or assessed on a par with

the financial strength of the applicants or the commercial relevance of the project.

The same is true of those companies that are offered financing by the 13 development enterprises which the Danish Agency for Development of Trade and Industry furnishes with guarantee insurance. One exception, though, is the company Miljøudvikling A/S, which specifically targets the environment - including the development of "green products."

In liaison with the Danish EPA, the Agency for Development of Trade and Industry manages two schemes that specifically target the environment. One is the programme entitled *Miljøstyring og miljørevision i danske virksomheder* ("Environmental Management and Auditing in Danish Companies"), which subsidises the work of disseminating environmental management. The second programme, *Miljø og arbejdsmiljø i mindre virksomheder* ("The Environment and Work Environment in Small Businesses"), grants direct subsidies to environmental activities in small businesses.

With regard to more concrete product and process development, the publicly subsidised technological service institutes (the GTS and TIC network) play a significant part, especially for the more traditional production companies that only do a certain amount of product development in-house. As regards strengthening the environmental competence of the GTS network, the **Ministry for Business and Industry** has established a shared base-subsidy programme for four GTS institutes by the name of *Miljøstyring og livscyklusvurdering* ("Environmental Management and Life-cycle Assessment").

The Ministry of Agriculture and Fisheries has a series of schemes of relevance to the development of cleaner production technology as well as cleaner products in agriculture. The chief activities take place within the framework of the Danish Product Development Act, the Act on Support for Structural Development in Agriculture and Organic Farming etc., as well as the Act on Support for Small-scale Farming Investments to Improve the Environment etc. Moreover, a general move has been initiated to develop renewable raw materials in a number of areas. There are also a series of smaller subsidy schemes, i.a. for continuing education and consultancy services.

From a product-development perspective, it is above all the schemes associated with the **Product Development Act** that call for attention. This Act is generally intended to promote the development of new agricultural and fishing products. The objectives of the Act do not mention promoting more environmentally sound production, though to a certain extent the Ministry

of Agriculture and Fisheries does consider environmentally-orientated projects within the administrative framework of the schemes. Thus, environmentally-orientated projects receive an increased subsidy under the following schemes:

- "Product Development in Primary Agriculture"
- "Processing and Refinement of Agricultural and Fishing Products"

The Danish R&D Development Programme for Food Technology (FØTEK) is based on interministerial collaboration between the Ministry of Agriculture and Fisheries, the Ministry for Research and Information Technology, the Ministry for Business and Industry, and the Ministry of Education. FØTEK's main aim is to secure and strengthen the position of the Danish food industry by supporting large, resource-intensive research projects with the potential to improve external constraints on the sector. Production methods compatible with the environment or work environment are one of the five areas of activity assigned priority.

In collaboration with other relevant ministries, the **Ministry for Research and Information Technology** manages a series of research and development programmes - including development programmes on biotechnology, materials technology and, as mentioned above, food technology. From a product development angle, the inclusion of environmental considerations in these R&D programmes is particularly important as the results of these programmes may contribute to future product development within the areas involved.

As an extension of this, the inclusion of environmental assessments in various subsidised programmes was embodied in the planning of the material technology programme. Preliminary evaluations of the first phase of the programme, however, have shown that only a limited number of environmental assessments have been conducted for subsidised programmes.

A series of educational and research institutions and centres are increasingly being encouraged to include environmental considerations in their research programmes. For example, in its new strategy, the **Risø National Laboratory** plans to assign higher priority to environmental considerations in all programme areas, including those of materials research and plant production. In future, the **Danish Technical Research Council** also plans to carry out environmental weighting of each research project application.

The Ministry for Environment and Energy administers a series of schemes which, to varying degrees, target the development of products with a lesser environmental impact.

The role of the Danish Energy Agency in the area of subsidies hinges above all on its management of subsidies to reduce industrial CO₂ emissions, subsidies to alternative sources of energy and to the Ministry of Energy's Research Programme (EFP). Moreover, if an agreement is reached on certain energy-conservation investments, the effect of administering the CO₂ tax reduction rules will be similar to the impact of the subsidy schemes. In recent years, the Energy Agency has put in much intensive work in the product area, with the EFP, for example, having financed a series of projects targeted at the development of less energy-consuming products. Among other things, the refrigerator with the lowest consumption of energy on the Danish market was developed with support from EFP. In connection with the administration of subsidies, environmental considerations are being integrated on a wide scale. The new "energy ice-breaker" scheme will probably also contribute to a general improvement of competence in the fields of energy and environment in the small businesses targeted by the scheme. Planning and funding of product-related projects are done in collaboration with the Danish EPA. However, there is still scope for further alignment of thinking when it comes to long-term activities.

The National Forest and Nature Agency's product development scheme for forestry and the timber industry subsidises development activities within primary forestry, and the processing and refinement of timber and wood-based products. In order to qualify for support, projects must not impact adversely on the environment or the work environment. What is more, a positive environmental impact is considered an asset for subsidy scheme applicants. It should be stressed that the environmental impact is examined at the time of developing new products, e.g. by drawing up a life-cycle assessment.

The Danish EPA's product-orientated subsidy schemes include the three programmes under the auspices of the Danish Council for Recycling and Cleaner Technology, under which it is possible to grant subsidies for the development of products less degrading to the environment:

- Development of cleaner technology, associated with *The Action Plan for Cleaner Technology, 1993-1997*.
- Protection of the environment and working environment in small businesses, in which the implementation of measures to protect the environment and working environment in small and medium-size businesses is directly subsidised.

- Waste disposal and recycling projects associated with *The Action Plan for Waste Disposal and Recycling, 1993-1997*.
- **Cleaner technology**

Since 1987, the Danish Council for Recycling and Cleaner Technology has subsidised projects aimed at developing and spreading cleaner technology among companies. Within selected industrial areas, the programme has succeeded in developing a series of cleaner technological processes that have been widely implemented in businesses.

Activities under the cleaner-technology programme consist of the interaction of projects specifically aimed at technology development, implementation and diffusion on the one hand, and of more general projects concerning the establishment of know-how and methodological bases as well as information on and dissemination of cleaner technologies on the other hand.

The current Action Plan for Cleaner Technology, 1993-1997, provides a framework for the cleaner technology programme. Under the aegis of this plan, the focal point shifts from developing cleaner technologies to disseminating and maintaining a strategy for cleaner technology in companies. At the same time, the programme has been reengineered away from developing cleaner technological processes towards developing products that are less damaging to the environment.

Up to and including 1995, 638 projects received DKK 537m in subsidies. The focus of activity was the development of cleaner **industrial engineering processes** in a number of select trades. In a comprehensive external evaluation of activities from 1987 to 1993, activities in the technological development field were commended for being decidedly successful, 80% of the projects having yielded workable processes involving cleaner technology. In relation to other engineering development programmes, this must be considered a relatively high rate of success.

Under the current action plan, support to projects falling within the areas of **products, materials and chemical substances** has increased markedly. Activity in these areas has focused on the development and testing of tools for product LCAs, a key role being played by the EDIP project (Environmental Design of Industrial Products). Moreover, the development of less environmentally degrading products is subsidised by means including the substitution of environmentally damaging materials. Finally, a se-

ries of projects to develop eco-labelling criteria and promote public green purchasing policies have also been subsidised.

Under this programme, it has not been possible to subsidise more trade policy-orientated initiatives or product documentation, marketing and export promotion. In terms of generally strengthening the trade policy dimension of the product-orientated environmental strategy, these elements should be included in the new scheme, hand in hand with other existing trade policy schemes.

The educational and training aspects of developing and implementing cleaner technology and products have been radically de-emphasised under the existing programme. Based on the importance of this area for the continued development of commercial environmental activities, the educational field must be prioritised with a view to establishing special LCA-orientated training and certifying courses.

Since, for the most part, the project initiatives in the programme have addressed the methodological and explanatory level, relatively few attempts have been made to combine product innovations with increased market pull. In the new programme, a trade-off of this kind should play an important part.

- **Environment and work environment in small businesses**

1994 saw the implementation of a programme called "The Environment and Work Environment in Small Businesses", aimed at offering direct subsidies for the introduction of systematic environmental initiatives in small and medium-size companies. The programme was implemented out of a desire to promote the introduction of environmental management in small businesses of this kind so as to spread and maintain the cleaner technology strategy in a large yet - from an environmental strategy angle - weak group of businesses.

The programme is based on standardised subsidies granted on objective terms. Projects are based on the appointment of a new employee (possibly as a substitute) for staff working on the project. The highest grant obtainable is DKK 400,000, assuming a self-financing ratio of 50%; otherwise, the criteria follow the minimum rules. To date, project subsidies have been granted to approx. 150 businesses.

Over a four-year period, a total of DKK 80m was earmarked; because of the large number of applicants, this has now been almost exhausted. Given

the large number of applicants, the positive feedback from the concurrent external evaluation and the results of projects completed to date, it is already possible to conclude that the programme has fulfilled its ambition of disseminating and maintaining the concept of cleaner technology among small businesses.

As a consequence of the success of the programme, there are plans to continue it in revised form, supplementing it with a concept to spread the adoption of environmental factors in product development in small and medium-size businesses. In this connection, formalised collaboration on the creation of professional training or a certification course should be put in place, to train personnel to carry out LCA-orientated tasks. These projects must be supplemented with demands for more detailed feedback on the results obtained in the projects, with a view to disseminating those results.

- **Waste and recycling**

Since 1987, the Danish Council for Recycling and Cleaner Technology has subsidised reuse. Until 1993, its funds were primarily spent on start-up grants for various recycling systems. The scheme was revised in 1993, so that only development and demonstration projects are presently subsidised, by analogy with the field of cleaner technology. As indicated in the Action Plan for Waste and Recycling, 1993-1997, the primary objective of the scheme is to subsidise projects aiming to decrease the amount of waste and to reuse materials, as well as those that diminish the impact of residual waste treatment on the environment.

Most of the funding of DKK 20m went towards developing various kinds of recycling system. Only a few of the projects subsidised were aimed at creating more recyclable products or modifying products to reduce their impact on the environment during the waste phase. Activities will also target the development of techniques for separating and subsequently reusing product materials etc.

In connection with the action plan "Clean Work Environment in the Year 2005," the **Ministry for Labour** has drawn up 7 overall visions for future work environment initiatives. In support of these visions, a number of specific funds have been earmarked. At present, funds have already been earmarked for Developmental Activities (DUA), and the National Labour Inspection of Denmark feels that money from this fund can be used to co-finance projects of relevance to both the environment and the work environment. Furthermore, a programme has been established in the field of

monotonous repetitive work (RSI), targeting small and medium-size businesses. Some decision is expected to be reached on setting up an indoor climate fund.

Ongoing discussions in the Standing Co-ordination Committee on the Environment and Work Environment will be used to study ways of reinforcing the collaboration between the various subsidisation schemes.

In those of its subsidy schemes that target urban renewal, the Ministry for Housing and Building is increasingly stipulating environmental criteria as a prerequisite to funding. The Ministry for Housing and Building is working to strengthen the environmental dimension of its subsidy schemes. Publicly subsidised construction projects constitute a significant part of total construction and planning activity in Denmark, and the Ministry for Housing and Building's initiative in implementing environmental criteria - including product criteria - is therefore of great importance.

In the area of transportation, the **Danish Ministry of Transport** spends a considerable amount of funds from the traffic pool, earmarked for development and experimentation, on developing methods of transport that are less damaging to the environment. For example, the traffic pool, in collaboration with the Danish EPA, has funded a large project on the use of cleaner fuel in buses.

Product policy initiatives

In conjunction with the use of public funds for various kinds of product development in the private sector, an environmental assessment of the projects needs to be carried out before any funds are granted. In this way, it will be possible to ensure that public funds are not spent on developing products and processes that are **more** damaging to the environment. For example, a broad overview of the **general** environmental factors is needed as well as the energy and work environment factors to be taken into consideration, so that such factors do not end up being counterproductive or obstructive.

Many ministries are already implementing environmental criteria in their administration of subsidy and loan schemes. In particular, the Ministry for Housing and Building and largely also the Ministry of Agriculture and Fisheries have included environmental considerations in their product-orientated support schemes.

No similar development has taken place to the same extent in the Danish Ministry for Business and Industry, which is one of the largest sources of subsidy and loan-financing schemes. In this connection, it is necessary to initiate a dialogue to promote more systematic environmental assessment of projects resourced through e.g. the Danish Fund for Industrial Growth. Carrying on from this, a variety of user-friendly tools must be developed to carry out environmental screening of such projects.

Experience from evaluating R&D programmes shows that if environmental considerations are to be taken on board in research projects, those in charge of funding will need to set aside time and resources to perform such environmental assessments, perhaps using consultants. To ensure the adequate inclusion of environmental considerations in the product and process-orientated part of research, sufficient resources must be earmarked for the project evaluation process in order to carry out the necessary environmental assessments entailed in implementing the project.

In the development area, resources should be set aside so that small businesses in particular can obtain qualified consultancy on life-cycle analyses for their products.

• **PRODUCT REGULATION AND THE DEFINITION OF NORMS AND STANDARDS**

Nationally defined rules and norms for products are increasingly being replaced by international norms and standards, primarily laid down by the EU and CEN/ISO.

To varying degrees, individual ministries participate in the negotiation of product standards within the respective relevant areas. For example, the Danish Directorate of Labour Inspection participates in international standardisation activities on a relatively wide scale with a view to ensuring that consideration is given to the work environment.

Recognising the importance of standards in the development of less environmentally degrading products, the Ministry for Business and Industry has set aside funds for a continued and strengthened Danish contribution to the inclusion of environmental considerations in international standardisation initiatives.

The Danish Energy Agency is particularly in evidence in the area of norms. The Energy Agency has done much work on the introduction of energy conservation norms in various energy-consuming equipment, and in the

area of refrigeration and freezers new norms have recently been adopted under the auspices of the EU.

However, a good deal of national norms and guidelines are still being drawn up in the product and materials area. This is the case in the area of construction, in particular, when the interest in integrating environmentally cleaner materials is increasingly being implemented in the guidelines elaborated under the auspices of the Ministry for Housing and Building.

Product policy initiatives

In this connection, it is important to support this development so that environmental considerations are included as a firmly integrated part of the product guidelines and norms elaborated within the relevant areas. Such inclusion must ensure that the rules under no circumstances act to block products that are less damaging to the environment.

The ministries are responsible for a series of product and performance standards as well as being the main negotiators of EU directives within their areas of competence. It is crucial for the individual ministries to contribute, as a matter of form, to ensuring that environmental assessments are incorporated directly in the standardisation process. In connection with EU legislation, it is up to the individual ministries to ensure that environmental considerations are embodied in the process of drawing up directives, and that environmental assessments are included as a criterion in any mandates given to CEN.

• OFFICIAL CONSUMER INFORMATION (ECO-LABELLING SCHEMES)

Publicly accredited consumer information is a significant factor in creating a market for products less damaging to the environment. There are a number of official consumer labelling schemes today in the field of product labelling, from hazard-labelling of chemical products, to eco-labelling of foods. Other environmentally related labelling schemes include the energy labelling scheme, managed by the Danish Energy Agency.

In terms of general official consumer information, of course, the **National Consumer Agency of Denmark** is the primary facilitator. Environmental aspects are increasingly being included in general consumer information from the National Consumer Agency.

Product policy initiatives

Since knowledge and information concerning the environmental properties of products rank among the central instruments of the product-orientated environmental strategy, continued collaboration with the National Consumer Agency must be strengthened, i.a. through co-ordinated campaigns. Likewise, co-ordination of campaigns is necessary in relation to activities in the field of energy.

• GOVERNMENTAL DEMAND

The dominant role of the government sector as a purchaser in a number of product areas opens up significant potential for influence. Initiatives concerning eco-conscious public procurement are described in Section 7.4.

The Danish Ministry for Business and Industry's development contracts are another way of influencing product development through demand. Since 1994, development contracts have been used as a hands-on tool to enhance collaboration between businesses and public institutions while making public demand more quality conscious.

The scheme enables public institutions to cover the extra expense of entering into agreements with private companies on the delivery of a new product or service. The public party to a development contract - a hospital, for example - is reimbursed for the extra expense it is incurred as a result of the development and purchase of newly developed hospital equipment as compared with standard equipment already on the market.

In order to qualify for funds from the pool, the contract must stipulate that the business has to undertake sizeable development activities. In return, the public party can guarantee a buyer for the first "order" placed for the product. So far, however, there are only a few contracts with an environmental objective. In 1997, it is expected that DKK 90m will be set aside for development contracts.

Product policy initiatives

An ongoing dialogue is taking place with the Danish Agency for Development of Trade and Industry on the development contract scheme, with a view to making better use of the scheme in the field of the environment. In

this connection, there needs to be ongoing co-ordination with the future development programme for cleaner products.

A dialogue must be initiated with the Danish Ministry for Business and Industry, similar to that mentioned above on the subsidisation of product development, with a view to elucidating the possibilities of carrying out environmental assessments in connection with the drafting of future development contracts.

E. Multinational manufacturers

Of the stakeholders who are relevant to the collaboration on setting up international regulations governing the general exchange of goods and requirements governing the environmental properties of products, the multinational stakeholders are among the most important. They have the resources to both influence policy-making and participate actively in promoting the development of more environmentally sound products.

The large multinational companies are especially to be found in chemical substances and agrochemicals, in the pharmaceutical industry, oil and gas, forestry, food and cars.

The 500 largest multinationals employ a total of 35 million people (or an average of 170,000 employees each), with a total turnover of approx. USD 11 trillion (or an average of USD 23bn each), and assets worth a total of approx. USD 32 trillion (or an average of USD 65bn each). Over half of these companies are American or Japanese. After that, the countries best represented are France with 42, Germany with 40 and Great Britain with 32 companies /2/.

Interests

In international negotiations, the large multinationals traditionally defend the following interests:

- Operational autonomy, referring to freedom of choice with regard to one's own actions, which products to produce, how to produce them, where to market them, etc.
- Free movement of goods and capital.

- Competition in the areas in which they perceive themselves to be strong. This means they are willing to compete on delivering products with improved environmental properties if they feel that this is an area in which they are competitive. (For example, agrochemical companies are willing to develop pesticides with improved environmental properties, but not to develop alternatives to pesticides. Likewise, PVC manufacturers do not care to develop alternatives to PVC, but are willing to develop less environmentally damaging emollients for PVC.)

Although the Danish market is small in relation to the turnover of the large multinational companies, they have still shown considerable interest in influencing Danish environmental initiatives in a series of areas. A good example is the interest shown by the agrochemical industry in Danish controls on the use of pesticides. This is probably due to their perception of the Danish market as a trend-setter in environmental issues. If regulations are implemented on the Danish market, that may have an inspiring effect, and other markets will then be expected to follow. That is why the Danish market is interesting and why they are willing to negotiate or fight for their perceived strategic interests.

Some multinationals see small and medium-size Danish businesses as interesting pilot companies for new environmentally improved products. For instance, Danish textile and graphics businesses have acted as guinea pigs for large textile and printing-ink distributors, to the advantage of both parties.

Significance

The large multinational companies are significant stakeholders in the national and particularly the international arenas, partly owing to the following:

1. First of all, they have many resources, both for participating in international negotiations and for providing whatever information accentuates their position most favourably.
2. They are able to effectively threaten commercial consequences as they account for a great deal of jobs and can move their assets between different parts of the world.
3. They are often research intensive and can therefore afford to be front-runners in the development of new, more environmentally sound technologies.

4. They act as sizeable sub-suppliers and buyers in relation to Danish producers and are thus keenly involved in stipulating the conditions of their product development.
5. They have large capital assets bound up with existing production apparatus, giving them an incentive to use them until they have been written off.

Consequences for product initiatives

The large multinational companies are complex but important participants in the dialogue. It is important to be aware of those areas where a dialogue can be productive and of those where collaboration can be expected to be more conflictive.

When negotiating with these businesses, it is important that the authorities should be ready to utilise the whole gamut of tools available to them as representatives of nation states by way of international alliances and agreements, taxes, prohibitive legislation, enforcement, subsidies etc.

The various businesses and sectors have different interests and can therefore be used to balance interests in a productive dialogue.

F. Nation states

The national stakeholders naturally make up a very uneven group, which will only be discussed very superficially here. The nation state stakeholders can be divided into three main groups:

- The developing countries.
- Countries with rapidly expanding economies.
- The industrialised countries, the US, Japan and Europe.

Resources

In combination, they are decisive in international forums organised on the basis of nation states, such as the UN, EU, OECD, WTO, ISO, etc. Thus, they have the sovereign political power to set the conditions for the international exchange of products and to dictate the environmental considerations to be taken on board in that connection.

The resources of the three groups are very different:

- The developing countries are generally weak stakeholders on the international stage. They have difficulty producing participants for negotiations, and those participants who do show up are usually poorly resourced in terms of information etc. On the other hand, there are many of them, so through sheer force of numbers they are able to play a decisive role in international negotiations.
- Countries with rapidly expanding economies are becoming more visible stakeholders in the international arena and their native resource bases are rapidly being built up.
- The industrialised countries are generally strong on resources and are well represented internationally. The US and Japan are the dominant individual stakeholders. Acting collectively, Europe has the resources to match the US as well as Japan.

Interests

In contrast to the multinational companies, the nation states cannot move, so their interests are tied to their own peoples, their own environmental conditions and the potential of their industry in global competition. This, of course, means that the interests of the three groups of nation states are very different.

The developing countries generally have very weak industries, producing goods with a low level of know-how, and are forced to compete on low wages and low all-round overheads - including environmentally. They therefore worry that their goods will not succeed if environmental criteria are to be implemented.

They find it difficult to influence negotiations where criteria for goods are defined and therefore regard such criteria with great distrust.

Countries with rapidly expanding economies generally have more varied industries, whose products in many - but far from all - areas will be fully competitive, also environmentally. In international forums, they are often suspicious of environmental criteria governing international trade.

The industries of the industrialised countries will generally benefit from environment-based competitive parameters. In many of the negotiations relevant to the development of product initiatives, the US and Japan act as a mouthpiece for their large multinationals and for their interests.

The European countries are a mixed group, who all act more or less on behalf of their industries, although the Scandinavian countries are generally more optimistic about their industries than those of southern Europe - a reflection of their respective industrial strengths.

In connection with efforts to develop a Danish product-orientated environmental strategy, a study has been conducted of the published experiences of other countries with product-orientated environmental initiatives. In this context, contact has been made with Swedish and Dutch environmental authorities with a view to gaining insight into the status of those countries with which we normally compare ourselves on environmental issues. The study of published experiences and the visits generally showed that the same kinds of deliberations are being made /3/.

Consequences for product activities

As concerns the collaboration between nation states, it is worth being alert to the fact that the long-term prospects of an expanding market for environmentally sound products mean that the collaboration is not a "zero-sum game." In an expanding market, one man's gain is not necessarily another man's loss.

The focus will need to be on contacts and alliances with like-minded Europeans and with some of the countries with rapidly expanding economies.

Support for the participation of developing countries in international negotiations should be considered, as for example the Netherlands and Finland have done in connection with ISO.

G. The European Commission

The European Commission is by far the most significant of the stakeholders in the international organisations. This is partly because Denmark participates in an agreement that gives the Commission an independent mandate to negotiate on Denmark's behalf, and partly because the Commission has resources for activities of its own. Under the terms of the treaty, the administration of the EU is required to promote the objectives of the Union and is entitled to perform initiatives of its own within current EU regulations as well as propose new regulations to the Council of Ministers. The Commission thus acts as an independent, significant stakeholder with considerable political, staffing and financial resources.

The overall foundation of the EU's environmental policy up to the year 2000 is described in the Fifth EU Action Programme, including the following priorities, which match very well some of the needs that have been identified in terms of establishing a product-orientated environmental strategy:

- Strengthening the integration of environmental considerations in other policy areas, especially in relation to the 5 sectors of the action programme.
- Increased utilisation of cross-cutting control instruments, including in particular market-based and financial instruments.
- Consciousness-raising and behavioural change among producers and consumers, including the development of viable patterns of production and consumption.

It will generally be attempted to harmonise individual environmental regulations, with the focus on avoiding the establishment of binding national environmental regulations or the establishment of environmental criteria that might act to obstruct commercial trade in connection with the demand for products.

The EU's conditions and potential for influencing a product-orientated environmental strategy

The Commission takes initiatives with respect to carrying out the above-mentioned policies in ongoing dialogue with nation states and lobbyists representing a series of various different nongovernmental organisations. In these dialogues, commercial interests clearly dominate over other non-national stakeholders.

The Commission normally draws up proposals for new regulations and initiatives in general. In many cases, however, the Commission is not sufficiently qualified to evaluate needs and consequences etc. itself. Here, the Commission has to base its work on input from the nation states and selected consultancy firms.

Similarly, more and more EU directives are being completed by having the Commission give its mandate to the CEN with a view to having the directive framework fleshed out. As the Commission has not yet drawn up procedures to follow up the CEN's completion of mandates, this mandating in reality results in a considerable amount of the Commission's competence being relinquished to the standardising groups.

Consequences for product initiatives

Broad contact with the Commission is of decisive importance. Moreover, this contact must take place during the early phases of deliberation by the Commission, before ideas turn into proposals. In all probability, this will actually be possible in the case of the product-orientated environmental strategy as considerations in this area have not progressed very far and only few of the other stakeholders have asserted themselves in relation to the Commission.

Important areas in which it will be necessary to take the initiative to approach the Commission include the following:

Environment and trade are significant areas with respect to product-orientated environmental initiatives, but also with respect to ensuring fair treatment for the developing countries in global trade.

- In standardisation activities, systematic lobbying of the 10,000 or so standards currently being processed by CEN with a view to implementing the Single Market will be decisive to the potential for including environmental considerations in future product development. Moreover, it will affect the potential for introducing eco-labelling. A considerable part of this effort will consist in influencing the Commission in connection with the mandating of standardisation initiatives.
- The EU Public Procurement Directive and internal purchasing policies must be influenced to make room for environmental considerations in public purchasing.
- Controls on the use of materials hazardous to health or the environment have been completely harmonised, and the creation of new, joint regulations as well as greater scope in which to carry out potential separate national regulations will depend on reaching a consensus with the Commission.

References

- /1/ The information given in the section on the finance sector is based mainly on: *Ressourceområdet serviceydelser* ["The Services Resource Area"], Danish Agency for Development of Trade and In-

dustry, March 1994, and on the 1994 and 1995 Business Reports, Danish Ministry for Business and Industry.

- /2/ Fortune 500, quoted from the Danish financial daily *Børsen*.
- /3/ *Baggrundsnotat vedrørende litteraturstudium i forhold til den produktorienterede miljøstrategi* ["Background Paper on the Study of Literature in relation to the Product-orientated Environmental Strategy"], Cowiconsult and Danish EPA, 1996.

Appendix 2

Appendix to Section 7.2: The environmental agenda

The purpose of this appendix is to supplement the environmental agenda review given in Section 7.2 with a more detailed examination of the central, high-priority environmental issues on which the product initiative focuses. It must be stressed that the account given in this appendix is general in nature and does not lay down new or revised objectives for individual emissions/environmental problems. It should also be pointed out that the objectives in question are not necessarily reproduced in their original wording from the political environmental objectives concerned.

The presentation offered here addresses the causes of the problems, the long-term environmental objectives selected and the political objectives, as well as the behaviour expected of the stakeholders in this field. A number of health-related problems will also be touched upon.

The essential environmental problems are as follows:

- A. The greenhouse effect
- B. Depletion of the ozone layer
- C. Smog/photochemical oxidation
- D. The nutrient load
- E. Acidification
- F. The use and spread of substances known as or suspected of posing a risk to the environment and human health
- G. The use of resources and impact on resources

This basket of prime environmental problems is well-known and has been described in a number of contexts, such as the 1995 report entitled "Denmark's Nature and Environment Policy," the Danish Ministry for Environment and Energy, "Environment and Society - A Status Report on the Development of Denmark's Environmental Standing," the Danish Ministry of the Environment, 1993, "Statistics on Nature and the Environment", Statistics Denmark and the Danish Ministry of the Environment, 1994, and "Background to an Environmental Assessment of Products", the Institute for Product Development, DTU, 1996.

The above references have been used in connection with the descriptions given below of the seven central environmental issues on which information is only included if considered relevant in terms of:

- knowledge of what should be the long-term objectives for initiatives taken;
- knowledge of the current and politically binding objectives of the various action plans;
- knowledge of the behaviour and commitment expected of the different stakeholders.

The long-term objectives for initiatives in this field are based on the intention of confining the load to the ecological space available, accepting only as much pollution as the ecocycle is capable of converting, implying that resource use either must not exceed the regenerative rate of such resources or that such use must not impair the living conditions of future generations.

A. The greenhouse effect

The present, politically resolved aim with respect to greenhouse gases under the UN Climate Convention takes the form of a declaration of intent to halt the growth of greenhouse gases contained in the atmosphere at levels of concentration that do not bring about hazardous climatic changes. Calculations made on the basis of scenarios set by the UN's Intergovernmental Panel on Climate Change have indicated that if the CO₂ concentration is to be stabilised at a level of 450 ppmv (parts per million of volume) - which, realistically speaking, must be considered the maximum improvement attainable - discharge levels from the group of industrialised countries will have to be cut by 50% by the year 2030 in relation to 1990 values. This is assuming that technology transfers will enable the same reductions to be made in developing countries within a period of 20-30 years. The conclusions of the UN's Climate Panel are also binding on Denmark.

The present Danish political objective includes a target from 1990 ("Energy 2000") of reducing Danish CO₂ emissions by 20% by the year 2005 (in relation to 1988). This objective also covers the target set for the transport sector of stabilising the 2005 level at that of 1988. This means considerable reductions will be required in other parts of the energy sector if the overall aim is to be achieved. For the transport sector, there is an additional target of reducing CO₂ emissions by 25% by the year 2030.

As can be seen, considerable disagreement prevails today between the long-term global aim and the politically determined objectives in Denmark. In 1997, a new protocol is to be adopted under the Climate Convention. As things look at the moment, new binding objectives and subsidiary targets will be laid down for various greenhouse gases and sectors. In the international climate negotiations, Denmark will work in accordance with the

Danish Parliament's decision of 30 April 1996 to promote objectives - and provide the conditions - for highly developed industrialised countries to reduce their CO₂ emissions by 50% by 2030 in relation to 1990.

Furthermore, 1997 will see Danish negotiations with industry to eliminate HFCs over a 10-year period. HFCs are powerful greenhouse gases whose use in Denmark accounts for 2% of the contribution to the greenhouse effect by CO₂.

Behavioural expectations

Danish objectives for the reduction of CO₂ emissions are based on a great many Danish initiatives and expectations with respect to behaviour, some of the most important of which are described below: "Energy 21" and the government's action plan for CO₂ emissions from the transport sector:

The individual household and the public sector should economise more on electricity consumption by buying appliances that consume less electricity, by discontinuing the use of electricity for heating and by improving building insulation standards. This behaviour is to be encouraged in particular by introducing a voluntary energy labelling scheme, by promoting energy labelling in the European Union and by introducing grants e.g. for conversion to district heating or natural gas, as well as by means of statutory requirements governing energy labelling and the preparation of energy conservation plans for buildings.

Consumers should choose more energy-efficient cars on the basis of such initiatives as information campaigns and possibly a labelling scheme, and the authorities will advocate the conclusion of an agreement between the European Union and the European car industry to reduce CO₂ emissions from new cars.

The haulage trade should become more energy-efficient (and less of an environmental load), especially by making more rational use of trucks and vans. A voluntary agreement may be relevant in this context.

The transport trade is a sector where many aspects that are difficult to regulate have a serious impact in terms of the environmental load from the sector. That is why there is such a significant need to focus on the consequences for transport of decisions made by individuals, public authorities or private enterprises. In their planning, national and regional authorities should focus on improving the scope for these stakeholders to display more appropriate behaviour in terms of transport.

B. Depletion of the ozone layer

The political goals for reductions for industrialised countries and developing countries have been laid down separately in the Montreal Protocol under the UN Environment Programme (UNEP), most recently streamlined in 1995. Since the global reduction aims are much slacker for developing countries and since considerable growth can be expected in such countries' use of ozone-depleting substances, these countries will contribute much more to the problem before they begin to scale down their use.

The Montreal Protocol is due for revision again in 1997 when the rules for phasing-out by the developing countries in particular are expected to be tightened. Denmark will advocate this in the coming international negotiations. One example for Denmark might be a tighter schedule for the elimination of HCFCs.

As mentioned, the Danish initiative targeted at the use of ozone-depleting substances is based on considerably stricter reduction targets. The final phasing-out of the use of HCFCs, trichlorethane and methyl bromide, is impending. These substances are about to be replaced by others already known to nature. Hydrocarbons will replace CFC and HCFC in aerosols, for the foaming of polyurethane foam and as a coolant in domestic refrigerators. Water will be used to clean electronic devices and natural gases to replace halon as a fire extinguishant. However, the greenhouse gas known as HFC has replaced CFC and HCFC for certain purposes - especially as a coolant and solvent. Natural cooling agents (ammonia, hydrocarbons, water and CO₂) are expected to replace HCFC within the next 10 years. HFC for foaming polyurethane is expected to be replaced by CO₂.

Under an agreement concluded by the stakeholders in this field on 1 January 1997, old refrigerators and freezers are to be collected with a view to draining them of ozone-depleting substances and having these substances incinerated.

Behavioural expectations

As can be seen from the above, future technologies for substituting ozone-depleting substances have already been introduced. In the remaining fields, new clean technology should be developed and tried out in co-operation between producers and users.

With respect to the collection of old refrigerators and freezers, it is up to the dealers and municipalities in particular to make sure that handling is managed correctly.

Finally, Danish companies within the industry should work to export the clean technology solutions they have developed in these areas and to transfer know-how to developing countries.

C. Photochemical oxidation

The long-term regional objective for photochemical oxidation includes the elimination of human injury and damage to ecosystems. However, there is no simple way of translating this objective into specific requirements for reducing emissions of the different contributory substances that form part of a complex interaction. Suffice it to say that the damage to vegetation and personal injury caused during smog incidents has shown that the environment's capacity to withstand degrading loads has already been exceeded.

As a regional objective for reductions, the Geneva Convention under the UN Economic Commission for Europe (UNECE) states that national emissions of volatile organic compounds (VOC) from all sources should be reduced to 30% by the year 2000 in relation to 1985. The European Union is preparing a directive to limit the VOC content of paints, varnishes and car-care products.

Over and above UNECE's reduction objectives, Denmark has laid down national objectives in two fields. "Traffic 2005" is an action plan containing an objective to reduce VOC from traffic 40% by the year 2000 and 60% by 2010. The Danish VOC agreement from 1995 lays down reduction objectives for VOC emissions from a number of industries and individual companies. The overall effect of carrying out the agreement will be a 40% reduction in Danish industry's VOC emissions by the year 2000 in relation to the 1988 level. These objectives are to be achieved by means of stricter exhaust requirements for different categories of car, stricter fuel requirements and a limit on the amount escaping in the form of petrol fumes during storage, distribution and filling.

There are no current objectives for an overall reduction in the use of organic solvents or the use of solvent-based products - including, in particular, paints and varnishes for buildings as well as cleaning products.

Behavioural expectations

The objectives outlined in "Traffic 2005" are to be achieved primarily by means of a number of initiatives addressing car manufacturing and the production and distribution of fuels. The individual citizen's scope for bringing his or her influence to bear relates to the planning of transport needs and to the choice of transport mode, including increasing use of public transport systems.

Efforts to reduce industry's organic solvent emissions include changes to a number of industrial processes and the use of alternative products with a lower content of solvents in such industries as: cars, furniture, food and allied, paint and varnish, and graphics.

With respect to the use of solvent-based products, both private and public purchasers as well as construction painters, consumers and retailers should ask for the low-solvent alternatives that do exist, especially in paint and varnish and in cleaning agents.

D. Nutrient load

The long-term objective for the supply of nutrients through water and air is to reduce them to a level at which no significant man-made impact on the environment is generated. This level cannot be determined off-hand, but a calculation of the share of total nutrient supplies caused by humans may give some indication. The man-made supply of phosphorus to lakes and the nitrogen supply to marine areas through air and water currently account for 2/3 and over 90%, respectively, of the total load. Groundwater cavity stores are judged to be less sensitive to nitrogen enrichment than surface water. Man-made nitrogen supplies from the air to rural ecosystems account for 95% of the nitrogen oxides supply and 85% of the ammonia supply.

The OSPAR Convention lays down a regional reduction objective of 50% for the nutrient salt load on surface water over the period 1985-95. In conjunction with the EU Nitrate Directive, the whole of Denmark has been designated one vulnerable area, where by very definition the groundwater contains or may eventually contain more than 50 mg nitrate/litre. The ensuing commitments are fulfilled by way of the Danish Aquatic Environment Plan and the Action Plan for Sustainable Farming, which together with the "Government's Ten-point Programme for Protecting Denmark's Groundwater and Drinking-Water" form the three/two most important national action plans/strategies with respect to nutrient salt pollution of the aquatic environment.

The objective outlined in the Action Plan for Sustainable Farming is a 50% reduction of the nitrogen emissions from farms by the year 2000 in relation to 1985. The ten-point programme, stemming from an objective stating that Denmark's water supply should continue to be based on pollution-free groundwater, contains an objective to the effect that nitrate pollution is to be halved by the year 2000 and efforts are to be made to protect groundwater against leaching nitrate by designating special drinking-water areas and by increasing the amount of afforestation and bioremediation.

Another facet of the groundwater strategy is that regional plans are to designate local groundwater resources of particular importance in ensuring the continued supply of drinking-water. The Action Plan for Sustainable Farming advocates protecting the groundwater in particularly sensitive rural areas through insistence on reduced fertilisation. Such areas are to be designated by the county authorities. Furthermore, the recipient quality plans prepared by the counties draw up specific objectives for the quality of freshwater and marine surface waters.

Behavioural expectations

Now that the Danish wastewater treatment plants have been expanded in accordance with the Aquatic Environment Plan, farmers and local authorities in particular are being called upon to make a special effort to combat the nutrient load on surface water and groundwater. Regional authorities are to designate the different types of area described above and farmers have to comply with a number of rules concerning the storage and application of manure from domestic animals.

Furthermore, support is available to farmers taking agricultural land out of production and running their farm more extensively in different ways. Last but not least, nutrients fed to animals should not exceed their needs and work should be done to improve the utilisation of domestic animal manure at every stage from pen to plant. Ongoing work in the farming community to promote the integration of environmental management and resource management in farming and to develop new feed standards are important initiatives in this context.

Additional improvements to the state of lakes (and streams) would call for initiatives aimed at rainwater-generated outfalls, waste water from scarcely populated areas and emissions from fish farms.

E. Acidification

The long-term regional objective for acidification is based on a reduction of the load to a level (the critical load) which in the short or long term will not cause acidification of the water or soil, or cause acidification damage to plants. Translating this objective into specific figures for the Scandinavian countries means cutting SO₂ and NO_x depositions by 95% while ammonia depositions need to be reduced by 85%.

The internationally determined political objectives in this area concern SO₂ and NO_x only. Under the UN Economic Commission for Europe (UNECE), a new sulphur protocol from 1994 makes it clear that the difference between the *deposition* and the critical load in the individual member countries must be reduced by 60% by the year 2000. UNECE's NO_x protocol commits Denmark to a 30% reduction over the 1986-98 period.

As a result of UNECE's sulphur protocol, the Danish objective for reducing sulphur emissions totals 80% for the 1980-2000 period. For NO_x, "Traffic 2005" stipulates that by the year 2000 the transport sector must achieve a reduction of 40%, and by 2010 a reduction of 60%, viewed in relation to 1988.

Behavioural expectations

With respect to SO₂ and NO_x, the regulation of power station emissions is very strict under the present quota scheme and, with respect to SO₂, even more so owing to a sulphur tax. The power stations will have to establish additional combustion engineering and flue-gas purification facilities in order to reach the goals set.

Apart from this, the NO_x emission reduction will be achieved particularly by stipulating stricter standards for NO_x emissions from cars and by modifying transport behaviour (choice of need and mode), as well as by possibly converting buses and coaches to natural gas as a propellant.

F. Use and spread of substances hazardous to the environment and health

The long-term objective for the use of chemical substances and products is to have the impact of such substances on the environment and on human health reduced to a level where there is no gradual deterioration of the quality of the environment and the state of health.

The overall objective is to minimise the life-cycle impact of chemical substances on people and their load on the environment, whenever possible, by ensuring that the concentrations of chemical substances in the environment and people's exposure to such substances are reduced as much as possible.

Since some chemical substances are carried substantial distances through air and/or across water, a number of international agreements and conventions have been concluded in the chemical field on efforts to reduce/phase out the use of selected chemical substances and products. The "Chemicals Statement" contains a complete list of these agreements and of the chemical substances (including pesticides) covered by the agreements. Many of these substances are already banned in Denmark as can also be seen from the Chemicals Statement (Appendix 2 to the Statement).

Two political decisions are particularly relevant for the Danish initiatives. For one thing, it was decided at the most recent North Sea Conference in the autumn of 1995 that the participating countries should work to put an end to discharges of environmentally hazardous substances into the North Sea within a period of one generation. The conference declaration focuses on the fact that the biggest problem today is the loss of xenobiotics from diffuse sources while emphasising initiatives to develop less environmentally hazardous products as well as to substitute hazardous chemical substances. A Danish North Sea Action Plan is going to be prepared, embracing the Danish initiatives taken to ensure that this and other conference objectives are accomplished.

In November 1995, the Danish Parliament further adopted a motion for the adjournment of future environmental policy, in which the phasing out of xenobiotic substances is listed as a high-priority area. "The List of Undesirable Substances" issued by the Danish Ministry for Environment and Energy has been prepared as part of a follow-up to these decisions. The list is intended to contribute towards a more long-term perspective for Danish efforts to limit the use of substances degrading to the environment and health.

The "List of Undesirable Substances" specifies a total of some 150 substances. These substances have been selected either on the basis of a systematic examination of the available information, concluding that they impose a severe load on the environment and on health today owing to their dubious properties as they impact on health or the environment and being marketed in Denmark in volumes in excess of 100 tonnes a year, or because they have been selected as a target for special efforts, either in Denmark or in various international contexts, on the basis of information

regarding the undesirable properties of such substances. The substances designated here are problematic, then.

Based on the "List of Undesirable Substances", a number of assays will be made to pinpoint the substances initially considered to be inadequately regulated.

With respect to pesticides, the Danish Pesticide Action Plan of 1986 lays down the objective of halving the amount of active substances used and the frequency of dusting before 1997 together with the goal of eliminating those pesticides representing the biggest environmental and health hazard.

Behavioural expectations

If the chemical load on the environment and on humans is to be reduced in accordance with the above-mentioned objectives, the focus must be on all stages of the life-cycle of chemical substances, and the brunt of the effort must concentrate on replacing hazardous chemical substances by chemical substances with known, less hazardous properties. Secondly, the problem must be solved by means of re-use, recycling, cleaning and/or dumping in controlled landfills, to ensure that the chemical substances are kept in closed systems and not spread unnecessarily. Of particular relevance in a product strategy context are measures for the increased provision and dissemination of knowledge about the properties of chemical substances and efforts to substitute hazardous chemical substances.

Manufacturers and buyers of products should pay special attention to the substances listed in the "List of Undesirable Substances" with a view to examining the potential for substitution. However, it is also important to note that the information given in the list on the applications of individual chemical substances is not exhaustive and that the chemical substances listed may well form part of product groups other than those mentioned.

The Danish EPA also publishes an "Effects List" comprising some 1,100 substances with undesirable properties, which are either present on the Danish market or are produced in large volumes in the European Union. The Effects List, which forms part of the basis for the "List of Undesirable Substances", contains a great number of substances which may not pose a problem today, not being in wide use, but which should be avoided for any large-scale applications, e.g. replacing other substances degrading to the environment and health, or for developing new products. This list should be used by producers and in some cases professional purchasers to ensure that alternatives to the undesirable substances identified have a less haz-

ardous impact on health or the environment than the substances they are intended to replace.

A special effort should be made to effect substitutions to substances known not to pose any risk to the environment or to health.

In addition to making use of the above-mentioned possibilities and the list of hazardous substances, and different organisations and institutions that provide consumer guidance on environmental issues, producers, traders and consumers should generally ask for information on the contents and use of substances degrading to the environment and health.

The work to increase the amount of substitution includes developing products containing less of the chemical substances that are harmful to the environment and health, as well as ensuring that such products are in demand and supply.

If hazardous substances are substituted in connection with product development, the focus should not only be on the hazard associated with the alternatives but also on the overall effects on the life-cycle of the product in the event of product modifications. Substances whose effects on the environment and on health are unknown should be avoided as far as possible - especially if they resemble the undesirable substances in pure form.

From corporate work environment studies, a number of examples can be cited where analysing the use of chemical substances of the company has enabled the number of different substances to be reduced quite considerably, many substances being used more out of habit than for any functional reason.

The products developed should be made as widely available as possible. Large retail chains should establish a policy ensuring that less environmentally degrading alternatives are available on their shelves.

Professional as well as private buyers/consumers should ask for those products that are eco-labelled or indicated by buyer's environmental guidelines as ranking among the best alternatives. Such consumers would also benefit from examining and reducing the number of chemical substances, and they should be conscious of using products correctly - including correct dosing of the chemical substances.

G. Use of and effect on resources

The following is an outline of issues and environmental objectives linked to the use of and effect on renewable and non-renewable resources. Renewable and non-renewable resources are described under one heading, these two types of resources often being interchangeable, and the utilisation of resources is viewed globally, regionally or locally, depending on the market in which trading is going on. Metals, fossil fuels, Danish mineral resources, groundwater and the land - including the basis for the production of foodstuffs and timber as well as the basis for maintaining the existing biodiversity - are issues in particular focus. Lastly, the behavioural expectations are described for the resource issue as a whole.

Metals

Metals are a globally significant economic resource for which the world-wide supply horizon is the best immediate basis for pinpointing the essential problems. This entity can be calculated on the basis of currently known reserves whose exploitation is commercially viable, together with the present rate of consumption. Setting a 50-year or less limit on the supply horizon, the metals zinc, copper, nickel, lead and tin will be prioritised (20, 36, 50, 20 and 27 years, respectively).

For a great many special-purpose metals used in small quantities, there are no reliable data on annual production. This is because of trade interests. However, this makes it impossible to specify a supply horizon. What is possible, though, is to assess the relative contribution these products make to the drain on resources, e.g. by product comparisons based on existing knowledge of the total resources of these special metals.

Today, the five aforementioned metals are re-used in the order of 75 to 90%. The remainder is typically contained in more composite products or domestic waste, making it relatively difficult to access.

As described previously, it is not possible to set a sustainable level for the utilisation of metals. Setting an objective of reducing world-wide primary resource production by e.g. 50% in relation to the 1990 level by the year 2030, acknowledging the principle of equality, would mean having to cut back European consumption by 80-90%. Thus, the reduction target for Europe very much reflects the redistribution of consumption that equal access to resources would entail.

At the moment, there are no binding objectives concerning the Danish use of the world's metal resources. However, the action plan and strategies in

the field of waste do include objectives to minimise the content of copper, nickel and lead in waste and to increase the recovery rate for such metals.

Fossil fuels

Economically speaking, fossil fuels are also considered highly important global resources. For the two most important ones - coal and oil - the supply horizon, based on current consumption, has been calculated as approx. 245 years and 45 years, respectively. The supply horizon for natural gas has been calculated as 66 years. Because of the special transport situation, natural gas should be considered a regional resource.

The biggest resource problem with respect to fossil fuels has to do with oil as it has the shortest supply horizon and is a higher-value resource, given that it has so many uses and - particularly within the transport sector - can scarcely be replaced in the short term.

The current Danish political objectives of relevance to the fossil fuels consumed by the energy and transport sectors have been described under the previous headings on the greenhouse effect and acidification as they address these environmental issues.

Land areas

Land areas should be considered primarily a regional resource. They constitute the basis of production for almost all our food, timber and paper pulp, some textiles and energy crops; and they must provide a basis for the different ecosystems and the plants and animal species contained in them.

The land area is also a limited and economically significant resource, so that there is often intrinsic competition between several of the above-mentioned uses of the land, both within a region and interregionally. The most important land resources economically with respect to production are made up of the fertile/arable land and areas suitable for grazing.

Sustainable land use presupposes that people's need for food, timber, bio-energy etc. can be satisfied regionally without reducing the expanse or fertility of the arable areas. At the same time, space must be provided to ensure stable ecosystems beyond the use and control of human beings, such as natural forests, meadows and heaths. Land use should further ensure that the quality of the environment - including the groundwater as well as soil quality, surface water, air quality and biodiversity - are not adversely affected.

With regard to farming areas, the current political objectives for overall land application are laid down mainly within the framework of the Euro-

pean Union's agricultural policy, which seeks to promote total farm production and farmers' earnings. In order to protect water catchment areas, future regional planning initiatives are expected to include the designation of areas of special drinking-water interest or particularly sensitive farming areas etc. for more extensive farming, set-aside or afforestation.

Recent years have seen the preparation of strategies and the setting of objectives in a number of areas relating to forestry, i.a. as a follow-up to the UN Conference on Environment and Development in Rio de Janeiro in 1992, at which forests were one of the central issues discussed, and as a follow-up to the Helsinki Conference of Ministers in 1993, when four resolutions were passed, the two most important ones dealing with sustainable forestry and the protection of silvicultural biodiversity.

The 1992 UN Convention on Biological Diversity lays down the general, national rights to a country's own natural resources and commits countries to preparing national strategies in this field. In addition, a number of more specific international conventions have been made that address such issues as the preservation of the natural habitats of wildlife and plants, and the protection of particularly endangered species of plants and animals. Denmark is honouring this commitment, i.a. by designating sanctuaries and establishing wildlife reserves.

The keywords of national and international forest policy are thus sustainable forestry and protection of silvicultural biodiversity, bearing in mind that the total acreage of forestry in the world, and in the tropics in particular, has been declining for many years and that the health of the forests is deteriorating owing to air pollution.

In 1994, the Danish Ministry for Environment and Energy issued a strategy for sustainable forestry. The prime objective of the strategy is to make the development of the country's forests as a whole sustainable. Moreover, in 1987, the government adopted an objective that mentioned doubling the acreage of Danish forest in the course of 80-100 years.

The Danish Ministry for Environment and Energy's "Strategy for Danish Natural Forests and Other Forest Types Worthy of Preservation" from 1992 is intended to safeguard the biodiversity of the forest, aiming i.a. by no later than 2040 to have an area equal to 10% of Denmark's present forest acreage set aside as natural or virgin woodland etc. Finally, the Ministry has a strategy for the preservation of genetic resources in trees and bushes in Denmark from 1994.

Danish mineral resources

In addition to oil and natural gas, which are extracted from the North Sea, Denmark mainly extracts such raw materials as sand, gravel and stone - accounting for 80%, chalk and lime - accounting for 12%, and salt. Raw materials are extracted mainly from rural areas (26m m³ a year in 1990-93), but also from the seabed (5.6m m³ a year in 1990-93). The volume extracted varies with developments in society and in the building and construction industry. Approximately 1/3 of the consumption of sand, stone and gravel is used for mortar and for concrete casting while the remainder is used in building and construction projects. Chalk and lime are mainly used in cement and as a fertiliser. In fact, 7-8 tonnes a year are extracted per Dane!

There is no scarcity of any of the above-mentioned raw materials in Denmark as a whole, but for transport economy reasons raw materials are often best extracted at sites near to their intended place of use.

Since the raw material resources and their sites of application are unevenly distributed across the country, and since a number of different interests have to be catered for when designating extraction sites, local shortages may occur.

Extraction, sorting and transport of raw materials produces different types of impact on the environment and the landscape. Some are temporary - such as air pollution from heavy traffic, temporary lowering of the groundwater and nuisances related to excavation work. In addition, some permanent changes occur to the surface of the earth, depending on the post-processing carried out at the site in question.

The long-term objective for utilising Danish raw materials involves local supplies wherever this is made possible by balancing such supplies against other interests and always provided that there is no negative impact on the quality of the environment.

Raw material extraction on land and at sea is regulated by the Danish Raw Materials Act, the purpose of which is to ensure that nature and the environment are taken into consideration in connection with extraction projects, though no specific targets have been set up in this area. The provision of secondary raw materials by recycling waste from building and construction is covered by the action plan for waste and re-use, 1996-2000.

Freshwater

Freshwater is a regional or local resource as the cost of transporting water will soon be prohibitive in light of the price of water. However, a variety of

imported products may generate considerable water consumption as a result of raw material production or manufacturing processes effected abroad (e.g. paper products or crops produced by irrigation).

Through the national monitoring program, an increase in the nitrate content of the groundwater has been documented for the period 1990-94. In 1994, 2/3 of the water utilities supplied water with a nitrate content of less than 5 mg/l. The recommended limit of 25 mg/l was complied with in 88% of all cases while in 3% of cases the water supplied had a nitrate content in excess of the permitted limit of 50 mg/l.

Also, the proportion of pesticides found in the groundwater would seem to indicate that this type of pollution is a serious problem. With respect to substances from waste dumps etc., which are alien to the environment, it is estimated that approx. 150 extraction wells have had to close down owing to their excessive content of such substances.

The long-term objective of the global freshwater supply is to meet people's freshwater requirements regionally without any negative impact on or deterioration in the quality of the environment.

The European Union's Drinking-Water Directive places a ceiling on the content of pesticides in drinking-water. This limit corresponds to the lowest level measurable at the time the value was fixed, which is to say that drinking-water should contain no pesticides at all. The EU Nitrate Directive designated the whole of Denmark a vulnerable area as the groundwater requires protection.

The current political objective for Denmark's water supply is to continue basing the water supply on unpolluted groundwater. The "Ten-point Programme for Protecting Denmark's Groundwater and Drinking-Water" lists a number of objectives and initiatives intended to ensure compliance with the overall targets:

1. Particularly harmful pesticides are to be eliminated.
2. A pesticide tax - the use of other pesticides is to be cut by half.
3. Nitrate pollution is to be cut by half by the year 2000.
4. Organic farming is to be promoted.
5. Protection of special drinking-water catchment areas.
6. A new soil contamination act - waste dumps need to be removed.
7. Increased afforestation and bioremediation are to protect the groundwater.
8. Intensified efforts within the European Union.
9. Better inspection of groundwater and drinking-water.
10. Dialogue with farmers.

Behavioural expectations relating to the use of and impact on resources

Product manufacturers should be involved in ensuring that, whenever such products are subject to extensive use, the integral content of energy, renewable and non-renewable resources and freshwater in their products is calculated on a life-cycle basis, and that such information is provided when developing and marketing the products. The amount of water and energy consumed by the product during the consumption stage is also to be calculated and stated to the greatest possible extent.

When developing products, the possibility should be considered of reducing the consumption of resources over the life-cycle of the products - including the possibility of recycling the products, taking into account the contribution such products might make to other pressing environmental problems. Foodstuff producers and manufacturers of products based on timber, paper pulp, natural textiles and other non-food crops should demand raw materials from areas where the raw materials are produced with the greatest possible respect for the preservation of local ecosystems.

Clients and contractors should work to minimise the consumption of Danish mineral raw materials in building and construction projects and to use raw materials of the right quality for the right purpose, thereby economising on valuable resources. In addition, whenever possible, their work should be organised so as to facilitate the subsequent recycling of the raw materials involved in as clean a form as possible. The parties should further ensure that waste from building and construction projects is separated and preferably re-used in the area it originated from. Liming and whitewashing should be done on the basis of needs analyses.

Retailers should be more active in ensuring that products with the best possible resource properties are available in their product range and should help make it possible to identify these products.

Danish consumers should preferably demand products with prime resource properties, with respect to both the integral (pre-consumed) content of resources and to the products' possible depletion of resources at the time of use.

In addition, consumers should demand basic foodstuffs produced in Europe, generating the smallest possible load on nature per nutrition unit. Vegetable foodstuffs and foods produced under more extensive conditions (such as organic farming) are relevant in this context. With respect to foodstuffs and non-food products not produced in Europe, products should be demanded that have been grown hand in hand with maximum efforts to preserve local ecosystems. Finally, it goes without saying that energy and water-intensive products should be used with discretion. Thought should be given to whether the use of such a product can be avoided completely (e.g. tumble-dryers), and appliances should be turned off wherever possible while economising on energy in general.

Appendix 3

Appendix to Section 7.5: Product area initiatives

The product areas in which the Danish EPA is primarily planning product-orientated environmental initiative are the following:

- A. Textile products**
- B. Electronic products**
- C. Transportation of goods**

These areas have been selected for the input they contribute to important but diverse environmental loads, and because they operate under intensely different business and market conditions. Together, then, they will be capable of reflecting the versatility required of product initiatives in terms of objectives, instruments and the significance of the individual group of stakeholders. Some have been selected because environmental efforts have made considerable progress in that particular area and/or the central stakeholders are willing to take the lead in product initiative terms.

The table below shows the differences between the product areas selected in terms of the priority environmental problems and their economic significance.

	Energy	Xenobiotics	Biological resources	Mineral resources
Textiles	X	X		
Electronics	X	X		X
Transportation of goods	X	X		

The table indicates the three priority environmental problems of significance to the product areas

	Turnover (DKKbn)	Employment (1.000)	Resource area
Textiles ¹	15.7	18.0	Consumer goods
Electronics ²	25.9	24.6	Consumer goods
Transportation of goods ³	24.6	22.5	Transportation

The table indicates the economic key figures for Danish manufacturing companies in the product areas selected (1996 Statistical Yearbook)

- 1) Textiles and clothing
- 2) Computers, electrical motors and telecommunications equipment
- 3) Hauliers

The following section offers a brief description of the areas selected. The description contains a broad description of the product area and its significance to Danish society. Then follows a synoptic description of the environmental impact generated by the product group in an overall perspective. Finally, the description contains a proposal for environmental objectives that may form part of an action plan for the area. The descriptions are drafts only, intended to form the basis for an initial meeting in the product area forum. Consequently, these descriptions offer only ideas and provisional assessments, no definitive attitudes or views having been formed in advance. Indeed, one of the main points of the product area panels is to try to obtain consensus on such attitudes and views.

A. Textile products

Textile products have been selected as a special area of action as the manufacture and use of textile products involves considerable consumption of energy, xenobiotics and biological resources. Added to this, environmental properties are already a competition factor in some market segments and, broadly speaking, Danish textile manufacturers regard the development of products with improved environmental properties as a strategy for survival. This is not least because most exports are bound for the quality and environmentally conscious parts of the potent German and Swedish markets. A number of companies have thus come a very long way in developing the environmental properties of products and documenting such properties. Furthermore, eco-labels have been developed for a few textile products, soaps and washing machines. Experience has thus been gained with different elements of a product initiative, and may form a basis for launching an overall priority drive with respect to textile products. Textiles fall under the "Consumer goods/leisure" resource area.

Product area profile

The Danish textile and garment manufacturing industry comprises some 500 companies. The textile and garment industry is characterised by many small and medium-size enterprises. Firms with fewer than 50 employees thus account for approx. 90% of all companies. Employment in the industry has fallen from approx. 30,000 to 15,000 employees over the past ten-year period.

Textile and garment exports are worth approx. DKK 12bn while Danish imports amount to about DKK 14bn. Most of the Danish production is exported - primarily to Sweden and Germany. The Danish textile manufacturers are facing an increasing and intensifying amount of international competition as a result of the deregulation of world trade. Increasing wage competition from low-pay areas in Asia and - most recently - Central and Eastern Europe constitutes a threat to parts of the industry. Two of the reasons why the sewing processes in particular have been moved out of Denmark are to be found in deregulation and increased competition. Design work and technology-intensive processes are likely to remain in Denmark as the level of training and education as well as the available infrastructure continue to make this advantageous.

Larger companies have relatively good product development skills. However, many of the smaller companies do not have the necessary competence and volume with respect to innovation, conversion, increased exports (including marketing capacity) and product development. The companies in the industry are organised in the Federation of Danish Textile and Clothing Industries while the employees are members of the National Union of Garment and Textile Workers in Denmark. The industry is characterised by fine co-operation with a differentiated structure of specialised companies.

In Denmark, the retail link for textile products has undergone major changes over the past 10-20 years. A large market for cheap textiles has developed; these are sold to large supermarkets or hypermarkets. At the same time, a number of nation-wide chains of shops have established themselves on the market, selling branded items and fashion. Small owner-operated shops are not widespread. Dealers of textile products are organised in the Association of Danish Textile Retailers while the importers are organised under the Danish Chamber of Commerce.

Different services relate to the use of textile products. A number of companies offer services based on the use of textile products only. This applies

to such enterprises as laundries, dry-cleaners and linen service companies. Other companies supply machines or chemical substances used in connection with textiles, such as washing machine and soap manufacturers. Such companies typically form part of larger (multinational) groups. The interests of the companies in the textile field thus have no decisive effect on overall actions and strategies.

The final disposal of textiles is handled either by the refuse collection service or by nation-wide garment collection organisations.

Environmental properties of textile products

The environmental properties of textile products in the different links are determined by such elements as the following:

Raw materials and semimanufactures

Growing cotton involves a significant environmental impact, in that a vast amount of farm chemical substances are used. The production of man-made fibres is based on oil, which is a non-renewable resource.

The production process

One serious effect of textiles produced in Denmark has to do with the dyeing and printing of textiles. Many different chemical substances and auxiliaries are used, which to varying degrees escape into the environment with the wastewater or airborne emissions. A small part is bound up in the garments and released during use and final disposal of textile products.

Part of the environmental load from Danish textile production ties in with transportation from the dyeing and printing processes, which are carried out mainly in Denmark, to the site of the sewing process, i.e. primarily Poland and the Baltic States. Low-price textiles from Asian countries are produced with somewhat less regard for the environment than Danish textile production. For example, a greater amount of - much more environmentally degrading - chemical substances may be used.

Distribution and trade

The primary problems relate to transport and packaging, though compared to the other phases of the product life-cycle these problems are not deemed immediately significant.

Use

Some chemical substances that are problematic with respect to the environment and health may be released from the textiles during use. Special

areas of focus are skin contact and emissions with the wastewater in the washing process. Also, large amounts of water, energy and chemical substances are used to wash and clean practically all types of textile product. For example, classification of the environmental impact of products, based on an eco-toxicological assessment made in a study of the environmental load generated by an average family, ranks textile soaps at the very top of the list. Industrial laundries and dry-cleaners must also be expected to generate a substantial environmental impact.

Recycling and disposal

Most textile products are incinerated in connection with final disposal but examples of textile fibre recycling have been seen.

Summary

As can be seen from the above, there are four areas which should be at the very heart of a product-orientated initiative: fibre production, substitution and minimisation of the use of chemical substances in the production process, the chemical content of the finished textile product, and minimisation of the use of chemical substances while the product is in use. Finally, a general reduction in the consumption of water and energy would be desirable.

	Raw materials	Production	Use	Final disposal
Denmark		Significant	Severe	Minimal
Other countries	Severe	Significant		Minimal

The table indicates where most of the environmental load is generated in the different stages.

Organising future efforts

In 1997, the Danish Ministry of the Environment will establish a product area committee, whose mandate will be to prepare and launch an action plan for a product-orientated environmental initiative with respect to textile products on the Danish market.

The following may sit on the committee:

- Representatives of different types of company in textile production (spinning mills, dye-works, clothing manufacturers etc.)
- Importers/producers of fibres, chemical and textile dyes

- Public-sector purchasers of textile products and representatives of different types of retail outlet selling textiles
- Consumers and green organisations
- Representatives of employees in the value-adding chain
- Representatives of other public authorities such as the National Consumer Agency of Denmark
- Technical experts and consultants advising companies in the value-adding chain on i.a. environmental aspects
- Representatives of importers and retailers

The objectives of the action plan might take in the following areas, in which the environmental properties of textile products could be improved by modifications to their design and useful qualities, thereby ensuring that they:

- are produced using much less energy
- are produced using much fewer ancillary agents hazardous to the environment
- are endowed with greater wearing strength
- will be more dirt-repellant
- will be easier to clean and require fewer chemical substances while in use
- will have a much longer life-cycle (depending on the use of the textile, of course)
- permit a high degree of material recovery
- cause only a small impact on the environment when finally disposed of
- lead to less in-use exposure to substances hazardous to the environment and health.

It must be stressed that a clash of interests may arise between some of the desired properties and qualities.

It may be possible to ensure the coherent development of textile properties, soaps and washing machine technology, resulting in fewer washes, smaller amounts and fewer types of chemical, as well as a washing process that requires much smaller water and energy input.

B. Electronic products

Electronic products have been selected because this product area is highly complex. It presents a problem owing to the mix of many different materials and substances - including a great many of the substances on the priority List of Undesirable Substances. This is an area undergoing rapid

growth, which is why a steadily increasing load on the environment is to be expected for quite some time to come unless the environmental properties of the products are brought into the spotlight. Another reason for selecting this area is that the electronics industry and trade is very active and a great many of the products on the Danish market are imported.

Electronic products fall under several resource areas: TV, radio and home computers belong under "Consumer goods" while electronic products for use in the pharmaceutical industry belong under "Medical/health". Product-orientated efforts are to be targeted at those products classified under "Consumer goods" and under "General service trades" (PCs etc., in wide use).

Product area profile

The Danish electronics industry numbers some 300 companies and employs a total of about 25,000 people. The vast majority of companies are small or medium-size enterprises.

In 1994, the total turnover of the Danish electronics industry was approx. DKK 25bn. The production value underlying this turnover was approx. DKK 13.5bn. Exports in 1994 amounted to approx. 94% of the production value. The most important market is Germany, but Sweden, Norway, the UK, USA and the Netherlands are also major importers of Danish electronic products. The electronics industry accounts for 4% of the total manufacturing output and 8% of Danish industrial exports. However, this industry foots more than 30% of the total R&D bill for Danish industry. The electronics industry is thus extremely development intensive.

The industry is very young, has great development potential and operates in a cut-throat market. Engaging in such competition requires real financial muscle, which is why the most powerful nations and companies primarily dominate the industry. The USA, Japan, Germany and France are the leading countries at the moment. The Danish electronics industry focuses on niche products that are too small for the very big manufacturers. Denmark has no semiconductor/chip manufacturers - the "core" developers and manufacturers. On the other hand, almost every other conceivable discipline in research, training, product development, sales and service is mastered by Danish companies. Danish companies are innovative when it comes to electronics and owing to the modest size of the companies they are highly dynamic - capable of making quick decisions and swift launches on the market. Products with improved environmental properties are now entering the market, some (of the bigger) manufacturers having opted for environmental properties as a competitive factor.

The electronics industry is very complex and is not organised in any one trade organisation. The electronics manufacturers in Denmark are organised in the Danish Electronics Industry Association (EI), which has just over 100 members. The IT Industry Association is another alliance of companies, also with just over 100 members. Finally, the Consumer Electronics Trade Organisation (BFE), made up chiefly of importers and manufacturers of consumer electronics, has approx. 60 members.

The retail link for electronic products in Denmark is divided into a market for home electronic products, on which price competition is fierce, and a market for products to be used by authorities and businesses, on which operational reliability and service are other important parameters. The low-price market is characterised by many non-product-specific discount chains and large supermarket/hypermarket chains. The remainder of the market is dominated by relatively well-consolidated companies/chains.

The electronic products comprised by this study are used in homes and offices.

The environmental properties of electronic products

The environmental properties of electronic products in the different links are determined by the following factors:

Raw materials and semimanufactures

Electronic products typically contain a number of different substances - metals (aluminium, iron, tin, lead, zinc and several precious metals), organic materials (glue, plastics, wood, paper/cardboard) as well as glass and ceramic materials. Many of the metals are only used in very small amounts in each product, but because the volume of products is so large and is set to increase constantly, such metals nevertheless constitute a severe burden. Some of the substances are also on the priority list because of their toxic effects.

The production process

Several processes in the making of materials and components give rise to a considerable load on the environment. One of the reasons for this is the use of heavy metals. However, clean technology has been introduced in a number of instances, thereby allowing an immediate reduction in the environmental load from the manufacturing processes.

Distribution and trade

There is a considerable amount of transport of raw materials, other materials and components as well as finished products, which may play a significant part in determining the environmental properties of a given product.

Use

Energy consumption and standby power consumption are among the most important black spots where action may be needed. Another problem, closely linked with all the problems mentioned here, is the very short life-cycle and period of use of these products. The short life-cycle stems mainly from the rapid technological advancements in this area, making it hard to do anything about the rate at which products are being replaced.

Recycling and final disposal

In Denmark, some 45,000 tonnes of electronic products are disposed of every year. These are highly complex products and the substances used are very difficult to separate, refine and recycle. This, too, is a major field where action is required.

Summary

The industry and the product group are very complex, which is why the observations made above are of a general nature only. To this must be added that the knowledge available about the industry's impact on the environment is very limited, which is why it will only be possible to give a rough outline of the industry in this respect. However, there is no doubt that there is a considerable impact on the environment from every stage of the industry. Issues relating to resource application, energy consumption during transport as well as during production and distribution, energy consumption during use and final disposal or recycling of the products are those that spring to mind.

	Raw materials	Production	Use	Final disposal
Denmark		Significant	Severe	Severe
Other countries	Significant	Significant		Minimal

The table shows the occurrence of the bulk of the environmental load in the different stages

Organising future efforts

In 1997, the Danish Ministry of the Environment will establish a product area committee whose mandate is to prepare and launch an action plan for a product-orientated environmental effort with respect to electronic products on the Danish market.

The following may sit on the committee:

- Importers/manufacturers of electronic products and semis for electronic products
- Representatives of the different types of company in the manufacture of electronic products (telephones, computers, TV sets etc.), including developers and designers of electronic products
- Representatives of the different types of retail trade selling electronic products, as well as public-sector purchasers of electronic products
- Consumers and green organisations
- Representatives of employees
- Representatives of other public authorities
- Representatives from waste handling, municipal or private
- Technical experts and consultants advising companies in the value-adding chain on aspects such as the environment

The objectives of the action plans may contain the following areas with scope for improving the environmental properties of electronic products in terms of their design and useful qualities, thereby ensuring that they:

- do not contain as many heavy metals, substituting conductive glues for lead soldering as lead constitutes a serious burden on the environment
- contain fewer different materials and are constructed to allow a high degree of material recovery
- consume less energy
- have a longer life-cycle and can be used for a longer period

It must be stressed that a clash of interests may arise between some of the desired properties and qualities.

C. Transportation of goods

Transportation of goods has been selected as an initiative area, being an area that contributes considerably to the environmental load (CO₂, air pollution and noise). Furthermore, transportation of goods has been selected because of the importance of gaining experience from initiatives in the service trades. Finally, this is an area in which the public sector plays a certain role as purchasers of transportation of goods and - more particularly, perhaps - as vendors of transportation of goods, not least in the towns (refuse collection, postal services etc.).

Product area profile

This product area covers transportation of goods by the following modes: aircraft, ship, rail, and lorry and van.

In international transportation of goods, i.e. transport between Denmark and other countries, ships are the dominant mode of transport, providing some 85% of transport operations (transport operations are obtained by multiplying the weight of the cargo by the distance covered). A good 10% of transport operations is effected by lorry while railways account for some 2%. Maritime transport is strong on low-value bulk goods needing to be conveyed long distances. Just under 60% of the volumes carried by ship is in the form of solid and liquid fuels.

With respect to national transport operations, lorries account for just over 80% while ships cover 13% and rail some 5%. Truck transport is the most expensive mode of those mentioned. The reason why this mode is nevertheless dominant in national transport is that it is strong on other competitive parameters such as frequency, accuracy, reliability and flexibility.

Based on an environmental assessment, truck transport is the least efficient mode. Truck transport represents approx. 20% of total national and international transportation of goods operations while the overland transport of goods accounts for approx. 75% of CO₂ emissions.

Efforts to minimise the load on the environment should thus be targeted at overland goods transport. The product area profile given below concentrates on this mode.

In 1993, the volume of goods transported nationally by lorries weighing more than 6 tonnes was just under 175m tonnes. Hauliers represented

125m tonnes or 72% while the remainder took the form of company transport (transport using a company's own vehicles).

In 1992, a good 11,000 VAT-registered companies were active within overland transportation of goods. This figure covers hauliers, furniture removers and other transport businesses. Most of these are hauliers - upwards of 90%. Of the VAT-registered companies active in overland transportation of goods, approx. 55% had a turnover of less than DKK 0.5m while 7.5% had a turnover of more than DKK 5m. 74% of the companies were one-man businesses. Consequently, this is an industry characterised by many small enterprises. Approx. 75% of the workplaces had less than 5 employees in 1992.

Overland transportation of goods employs a total of nearly 45,000 people, corresponding to 1/3 of all those employed in the transport sector. 34,500 of these are employed in a haulage company.

In the 1992 resource area analysis from the Danish Agency for Development of Trade and Industry, one of the conclusions is that the many small companies play an important role as subcontractors to larger companies as they operate as a flexible capacity. On the other hand, the small companies act as a barrier to the development of in-trade competence with respect to transport service and the application of new knowledge.

The analysis also offers an assessment of the development towards increased liberalisation and deregulation, stating that these will result in tougher competition for hauliers in the European Union and on their domestic markets. Conversely, Danish competitiveness is considered reasonably good as can be seen from the fact that 74% of the overall import and export volumes are moved by Danish companies.

The haulage companies are organised in the Danish Road Haulage Association, the Association of Danish International Road Transporters and the Danish Haulage Contractors' Employers Association. Other organisations in this product area are: the Danish General Workers' Union (SID), the Danish Shipowners' Association and DSB Freight.

The environmental properties of transportation of goods

A detailed analysis of the environmental load generated by transportation of goods comprises life-cycle assessments of the environmental impact in the following four stages: raw material production, manufacture, operation

and final disposal for each element of the transport sector: traffic systems, propellants and means of transport. An analysis /1/ of this type shows that the environmental load is largely generated by the means of transport while the load from traffic systems and propellants is insignificant as far as most environmental problems are concerned. Furthermore, the analysis states that the environmental load is greatest during the operating stage. For example, it is estimated that 80% of the total energy consumption in the transport sector stems from the operating stage, just as air pollution and noise are generated mainly at that stage.

Organising future efforts

A product area has to be selected on the basis of the initiatives already taken or expected to be launched in the near future.

As part of its work on the transport/supply resource area, the Danish Ministry for Business and Industry has established a transport and logistics group, whose primary assignment is to discuss business policy objectives for this resource area. This group also discusses environmental issues to the extent that they tie in naturally with business policy discussions. The Ministry for Business and Industry is also responsible for maritime transport.

The Danish EPA has overall responsibility for environmental management and thus for the transportation of goods used by manufacturing companies. In addition, the EPA is an important stakeholder when it comes to public procurement, certification/eco-labelling and corporate environmental management etc. in this product area.

As a follow-up to *The Government's Action Plan to Reduce CO₂ Emissions from the Transport Sector*, the Danish Ministry for Transport will be entering into a dialogue with the hauliers in an attempt to optimise transportation of goods from an environmental perspective. The Ministry for Transport has sectorial responsibility for the transportation of goods business, covering road, rail and air transport, making it only natural for the Ministry to take the initiative in this dialogue. The Ministry intends to dovetail its work with a product-orientated environmental strategy in its dialogue with the enterprises transporting goods. At this juncture, the Ministry has not yet decided how to implement its work to promote a product-orientated environmental strategy. The proposals for participants and action plan objectives listed below should therefore be regarded as a source of inspiration in the continued deliberations regarding the organisation of this work.

The following might participate:

- Vendors of transportation of goods services (DSB, hauliers, forwarding agents etc.)
- Large public and private-sector purchasers of transportation of goods services
- Consumers and green organisations
- Representatives of employees in the transport chain
- Representatives of other public authorities
- Advisors for the companies in the value-adding chain on issues relating to the environment (consultants, auditors etc.)

The objectives of the action plan may contain the following areas with scope for improving the environmental properties and qualities of transportation of goods, thereby ensuring that:

- the utilisation rate for vehicle transport capacity is considerably increased
- the environmental load and energy consumption per kilometre are considerably reduced
- cleaner and less burdensome modes of transport (ships and railways) are given higher priority.

Among other things, the action plan could be based on the various action plans made for the transport sector as a whole.

Reference

- /1/ *Forstudie til livscyklusanalyser i transportsektoren* ["Preliminary Study on Life-cycle Analyses in the Transport Sector"], Danish EPA, 1992.

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Miljøproblemerne er i dag så alvorlige, at indsatsen for miljøbeskyttelse må suppleres med aktioner, som er rettet mod alle aspekter af produkternes livscyklus. Indsatsen skal gøres i tæt samarbejde med aktører, som kan påvirke produkterne miljømæssige belastning. Målsætningen er at styrke udviklingen, fremstillingen og afsætningen af renere produkter. Miljøstyrelsen har derfor udarbejdet dette forslag til en styrket produktorienteret miljøindsats. Forslaget er rettet mod politikere med interesse for miljøet, og mod alle grupper af aktører, der har indflydelse på produkternes miljøegenskaber, herunder designere, producenter, forhandlere, miljømyndigheder, forbrugere og vidensformidlere.

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The serious environmental problems of our time call for the environmental protection provided so far to be supplemented with measures dealing with all aspects of product life-cycles. This needs to be done in close co-operation with stakeholders, who may influence the environmental impact of the products. The goal is wider development, production and sale of environmentally sound products.

The proposal for an intensified product-orientated environmental initiative is aimed at politicians who take an interest in the environment and at all groups of stakeholders essential to any product initiative, including product developers, manufacturers, trading companies, environmental administration agencies, consumers, know-how suppliers etc.

Terms:

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