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Environmental Product Chain Management

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Danish Environmental Protection Agency
Danish Ministry of the Environment

The Danish Environmental Protection Agency will, when opportunity offers, publish reports and contributions relating to environmental research and development projects financed via the Danish EPA.

Please note that publication does not signify that the contents of the reports necessarily reflect the views of the Danish EPA.

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 recent years, a number of Danish enterprises have established environmental cooperation under which different enterprises in a product chain each contribute to an improvement of the overall environmental performance of the final product. Environmental cooperation in the product chain in many cases can be seen as an extension of the environmental management system of the individual enterprises.

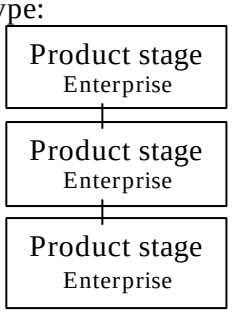
The Environmental Council for Cleaner Products in 2000-2001 initiated a collection of experience from the environmental cooperation in 25 product chains. This collection of experience was to elucidate the concrete cooperation between suppliers, enterprises and purchasers, to go through tools and to report on opportunities and barriers for environmental efforts in the entire product chain. The studies were made in two stages, the latter focusing more on perspectives relating to eco-labels /environmental product declarations and environmental cooperation across borders.

To allow for future exploitation of Danish experience with environmental cooperation in product chains, the present report aims to communicate experience from the 25 environmental product chain reports in a uniform and clear manner. The description of each example of product chain cooperation is based on a template with the following headlines:

- Start phase
- Product chain
- Environmental cooperation
- Environmental achievements
- Perspectives

It should be noted that additional information has been collected, neither from enterprises participating nor from consultants behind the individual reports. As the underlying reports (to a certain extent) have different structure, extent and contents, it has not been possible to elucidate all issues in the same detail for all examples of environmental cooperation. The underlying reports may be found in full (in Danish only) on the website of the Danish Environmental Protection Agency www.mst.dk under "publications".

For product chains where a real cooperation among several players is clear, it has been illustrated with a diagram of the following type:



This report has been made by
Birgitte Ettrup and Bjørn Bauer,
PlanMiljø, spring 2002.

1. Summary and conclusions

The studies of environmental cooperation in product chains have taken their starting point in enterprises having already an environmental management system. By involving suppliers, cooperators and in some cases customers in the efforts to improve the environmental profile of a product, the environmental focus of enterprises is extended to cover a larger part of the life-cycle of the product.

The product chain cooperations studied focused primarily on environmental impacts from the product itself, and there are only few examples of inclusion of global environmental impacts from the product life-cycle. The product chain cooperations studied thus mainly deal with constituents in the product, for example by focusing on documentation on the product or substitution of constituents.

1.1 Motivation

For many enterprises, one of the essential factors for starting a cooperation with suppliers on the development of a product with an eco-friendlier profile is a wish being an environmental frontrunner. Here, one of the essential elements is green public purchasing. Furthermore, customers on the German market are said on several occasions to have a catalysing effect, due to the many questions asked as well as direct requirements.

The most critical customers are used in some (few) enterprises as an inspiration for further product development, as they are expected to give a good indication of future developments on the market.

Some of the examples studied have been granted support from the Danish Environmental Protection Agency's competence scheme or other public funds. External financing in these cases has been decisive for product development, since the support has given enterprises more scope for testing new methods or conducting more comprehensive analyses without expecting direct cost-effectiveness.

A few enterprises of the 25 examples select partners for cooperation on environmental issues in the product chain based on a review of global environmental performance in the product chain life-cycle. However, in most cases it is seen that decisive parameters for selection of cooperators are existing cooperation relations, personal acquaintances and – naturally – the significance of the different cooperative relations in terms of finances and/or strategy.

1.2 Driving forces and barriers

In environmental management work, backing from enterprises' management is important, and the examples illustrate that this is also the case for

environmental cooperation. Whether environmental cooperation with suppliers arises out of visions and strategies in the enterprise, or whether it is initiated at a more decentralised level in the enterprise due to, for example, existing cooperative relations on product development, cooperation typically is only translated into concrete environmental results, if management shows clear support. If not, staff spends resources on other essential activities.

Running-in of new procedures in production may face resistance with staff members, and some departments may find it difficult to accept inclusion of environmental arguments in their work. In this case it is particularly important with management backing, to ensure allocation of the necessary resources for environment work. If the enterprise has a ”pioneer”, he or she may assume the crucial function of ”selling the message” on perspectives of environmental cooperation to colleagues and management, just as this dedicated person may hold on to focus, contacts and personal relations with respect to suppliers and customers.

Dialogue and development of environmental cooperation with suppliers and customers is seen by many as a comprehensive task requiring additional resources. This is especially the case if there is not already a cooperation among enterprises, for example on product development, as in this case contacts among the relevant persons in enterprises must be established as a first step. The success of cooperation depends largely on personal contacts, and several enterprises point out that if contact persons are replaced dialogue among enterprises is set back. Good personal contacts with a common understanding of what is important to clarify in connection with the environmental cooperation eases dialogue and work on procurement of documentation. Confidence among parties is a clear precondition for exchange of product information among enterprises.

Several enterprises have trained their sales personnel in including environmental parameters in their sales work. Price and delivery used to be key arguments, but now it has become necessary to acquire new knowledge on products’ environmental properties to ensure that advantages also in this respect play an active role in customers’ choice.

Lack of systematics and follow-up in environmental cooperation may cause the project to be a one-off event instead of a development process. Often, cooperation between enterprises and suppliers is based on the solution of a specific task. Once the task has been completed, there is in many cases no system to follow-up this cooperation, which is consequently discontinued.

To make the best of the environmental cooperation external consultants have often been called on, for example for identifying essential areas of effort, systematising efforts or applying the documentation provided. Several enterprises mention that the external assistance as had a catalysing effect for capacity building internally in the enterprises.

It must be easy to find information or to ask questions from customers to the right persons. Therefore, focus is put on internal organisation and knowledge of staff responsibilities. External contact often takes place through sales or purchasing departments, so these departments must have solid knowledge on enterprises’ environment work to enable then to refer

directly to the relevant staff members, when more detailed knowledge is needed.

The chemical industry has some particular features. Traditionally, much attention is paid to safety in product handling, and the risk of accidents in connection with processing and use, storage or transportation of substances, for example, may become a negative press event. One of the examples discussed illustrates clearly the wish for secure handling of chemical products, as the supplier sets requirements to customers for introduction of safety measures and contributes to the implementation of environmental management systems with customers.

In several environmental cooperations enterprises participating are the frontrunners of their sector. These enterprises in particular experience that the thorough environmental perspective is not necessarily reflected in a clear demand for environmental advantages of products. The environmentally optimised products are often slightly more expensive than traditional products, and for this reason enterprises' expectations as to larger market shares are not always met. This is particularly clear in sectors where competition typically lies in other parameters – for example the clothing industry. It may be difficult to sell products on their environmental properties, so environmental advantages are often pointed out in connection with other parameters such as quality or optimised delivery. Other enterprises choose to intensify sales work and service in connection with the use of products.

It is seen that customers demand product properties that have been phased out or that enterprises wish to limit for environmental reasons. Customers' knowledge on impacts from a product may imply that it may be difficult to replace constituents or change properties, giving the product a better environmental profile.

1.2.1 Documentation and environmental product declarations

Environmental cooperation among enterprises often implies a need for exchanging more detailed information on products and components. Several enterprises experience that it may be difficult to communicate products' environmental advantages to customers. For example, it is pointed out that there is no unambiguous template for preparing environmental product declarations, so it may be difficult to compare directly products' environmental properties.

Enterprises often meet difficulties when asking documentation from suppliers on constituents or properties of constituents. The problem seems to be largest when documentation is requested from (not least large) foreign suppliers from countries where there is not necessarily the same attention to environmental issues and where the individual (small) customer has little strategic importance. It is in particular small enterprises that find documentation and writing procedures time-consuming and burdensome.

Particularly in the chemical industry it may be difficult to provide documentation for constituents, since exactly the recipes may be a significant competitive factor. In some product chains committing cooperations have been entered, where confidentiality among enterprises can be guaranteed,

whereas other chains choose to manage documentation more indirectly through requirements for products' properties instead of for constituents.

It is seen that suppliers reject a customer imposing too heavy requirements in connection with supply. This is seen, for example, if documentation is requested on matters that are not already described, since many resources are needed to provide documentation. The high environmental requirements thereby may reduce the number of interested suppliers.

Concrete questions from customers to products' environmental profile range broadly. Sometimes, diffuse and general questions are asked that are not focused on specific environmental issues – making them very hard to answer. In connection with this inconcrete environmental demand some enterprises have spent resources on providing documentation that was not requested at all. It is also seen in several cases that products' environmental properties, despite requests, are not used as a criterion for customers' choice of products, since irrespective of environmental profile, for example, the cheapest product is chosen anyhow.

In the examples in the next section, documentation and environmental product declarations are discussed in, among others, the following examples: 1, 2, 3, 5, 10, 11, 14, 18 and 23.

1.2.2 Eco-labels

Among the examples for environmental cooperation in product chains some enterprises have opted in on eco-labels and some have opted out of them. The advantage of using eco-labels is that the customer can easily chose in connection with "green purchasing". The eco-label has been pointed out as an asset in connection with public purchasing since in many public offices for a number of years there has been a wish of documenting a green purchasing profile. Eco-labels are a tool for communicating in a simple way complicated information on environmental issues where there is no need for detailed information.

Many enterprises having considered eco-labelling of their products find the Nordic market particularly attractive for these products, as the remaining international market does not show the same attention to products' environmental properties. (Not surprisingly), this goes particularly for the Nordic eco-label – the Swan – since enterprises asked only find limited knowledge of the Swan eco-label outside the Nordic countries.

By contract, some enterprises with international marketing expect that environmental advantages developed for the Nordic market may be used as a catalyst for products sold outside the Nordic market.

In connection with labelling with the Swan, producers are charged with a turnover fee of 0.4%, and some enterprises mention this fee as a barrier for the label. Several enterprises manufacture products complying with the criteria of the Swan, but chose not to apply for a licence for the label. Within a product series there may be more products complying with the Swan criteria and where the enterprise chooses to only label one produce in the product group in question. Thus, the enterprise may deliver to customers demanding explicitly eco-labelled products, whereas other customers

can choose to "purchase green" without paying the fee on the Swan licence.

Information relating to product chains with respect to the European eco-label the Flower cannot be derived from the 25 examples.

In the examples in the next section, eco-labelling is discussed in, among others, the following examples: 1, 2, 11, 12, 13, 19, 20, 21, 22 and 23

1.2.3 Cooperation with foreign suppliers

It is seen from the 25 examples that cooperation with foreign cooperators on environmental issues may be difficult. Often, it is easier to start a dialogue with Danish suppliers understanding more directly Danish environmental legislation and interests on the part of enterprises in finding documentation. As mentioned, it may be particularly difficult to find documentation from (not least large) foreign suppliers from countries where there is not necessarily the same attention to environmental issues and where the individual (small) customer has little strategic importance.

Often, contacts with foreign suppliers passes through contact persons that may be located far from the production, and as environmental cooperation often implies discussions of technological developments, it may be difficult to establish communication of this kind. Finally, linguistic barriers may have an impact on the benefits of an international environmental cooperation.

It should also be mentioned, however, that it was pointed out from some enterprises that nationality of cooperators is of no importance whereas corporate culture is more important with respect to opportunities for environmental cooperation in product chains.

In examples nos. 1, 22 and 24 aspects on cooperation with foreign suppliers are discussed.

1.3 Results of environmental cooperation

Environmental cooperation in product chains aims to improve the environmental profile for a specific product (or global environmental impact of an enterprise). It appears from the summaries of product chain cooperation examples that they have led to a number of concrete environmental achievements. However it has not been possible precisely for all product chains described to state the concrete environmental benefit from the cooperation. This is for example the case for phasing-out of specific problematic substances and materials or optimised use of products.

In addition to concrete environmental benefits a number of tools have been developed that may be used in a continuous optimisation of the environmental cooperation in a product chain. This is the case, for example, for systems for assessment of suppliers or systems for marketing of environmental advantages of products. In many cases there has also been an improvement of enterprises' internal organisation, for, for example, there has been focus on internal communication. Thus, the basis has been created

for a closer cooperation both among enterprises and internally among departments in the enterprise.

The examples described indicate that good environmental results in particular arise out of real cooperations where, for example, a central enterprise with a good environmental grasp contributes to suppliers' (and in some cases customers') development in the environmental field. Further, it is seen that clear communication to suppliers on environmental policies and objectives of an enterprise may pay off by innovative steps taken by the supplier (see examples 5 and 15).

1.4 Perspectives for further development

The cooperation on environmental improvements in product chains altogether has given enterprises a capacity building in the management of environmental issues and in cooperation with other enterprises. The extended focus for environment work – with product life-cycle considerations – and experience with cooperation opens up for extension of environmental cooperation interplays and increased environmental benefits in future.

On the basis of the examples presented some areas can be identified where environmental cooperation in product chains seem to present special scope for development. This goes both for when it may be relevant to extent the environmental cooperation in the product chain and for how to exploit the environmental cooperation in other areas.

It is clear that many enterprises having work with their own environmental issues for a number of years will be able to obtain environmental benefits from extending the future preventive environmental efforts to also cover suppliers and customers.

Environmental cooperation in product chains seems not least relevant in sensitive markets such as the chemical industry, where accidents may cause large environmental impacts and thus attract attention. This brings the entire product chain into focus, linking responsibility for products and services of the enterprise to the reputation of the enterprise.

On markets with few suppliers purchasers have a large need for establishing formalised cooperation with suppliers to ensure that suppliers are involved in the development of products.

Enterprises' environment work often arises out of interest in their own or their products' environmental impact, and it is therefore not directed directly at suppliers' global environmental impacts. Typically, it is difficult to delimit, for example, suppliers' energy or water consumption from the manufacture of individual components, and often enterprises find it more evident to follow constituents of the product or the components instead of environmental impacts from the manufacturing process. A more comprehensive LCA perspective in this context seems to be realisable only in a distant future.

Only a minority of enterprises so far have based the environmental cooperation on a real life-cycle approach, where environmental hot-spots in a product chain have been identified based on comprehensive screen-

ings. The need for general tools facilitating the completion of such analyses has been pointed out, forming the basis for development of products with improved environmental properties in the entire life-cycle of the product. This is not least the case where an essential part of environmental impacts in a product life-cycle lie beyond the individual "key enterprise".

Products' environmental profile already today is a competitive parameter in markets, where customers' need for documenting an environmental profile in connection with purchasing (for example requirements for public green purchasing) have an impact on choice of products. Green purchasing has not penetrated as markedly as many front-runner enterprises would have wished, but several enterprises expect that development of products with an environmental profile in future may be used as a catalyst on the international market. This is also supported of the ideas in, for example, the EU Commission's Green Paper on integrated product policy.

Technically, there are good opportunities for improving the global environmental profile of a product. The speed of environmentally optimised products' penetration may be enhanced through focus on:

- development of easily accessible tools for environmental cooperation in product chains (for example standards for preparation of environmental product declarations)
- support for establishment of enterprise network (for example in product chains) with special focus on the environment
- development in market demand for environmentally optimised products
- development of ability and willingness of individual (groups of) players to contribute to reducing environmental impacts in a life-cycle perspective
- larger insight into organisational preconditions for smooth environmental cooperation in product chains

1.5 Areas for further efforts and clarification

The summary of the 25 product chain reports points to a number of elements that may form the starting point for further discussions. Below four areas of discussion are identified that would be relevant to further elucidate to provide the basis for supporting developments in environmental cooperation in product chains.

1.5.1 Market perspectives

To make way for the largest possible benefit from environmental efforts it is important for enterprises to pay attention to market developments. However, it may be difficult for the individual enterprise to follow developments in the "green market" closely, and many enterprises would benefit from an insight into market dynamics with respect to environmentally optimised products. At the same time, this would provide better opportunities for conscious marketing of environmental advantages of products.

Questions for clarification of the area:

- To which extent are environmental issues seen as a competitive parameter?

- How to market environmental advantages (offensive influence on demand)?
- Are environmental differences among competitive products visible/transparent?
- What can enterprises do to visualise environmental advantages?
- What is the implication of customer type (consumers, enterprises or public purchasers)?
- How to include dynamics with respect to market changes?
- How are these dynamics reflected in the internal organisation of enterprises?
- What are the bottlenecks with regard to sale of environmentally optimised products?
- What is the wish-list for other players (shareholders, investors, staff, customers, suppliers etc.)?

1.5.2 Strategy for cooperation

Many enterprises can have more benefit from their environmental efforts by gathering stand-alone or sporadic processes on supplier cooperation to a global effort where formulation of a strategy prioritising areas of effort may strengthen environment work. Such a strategy naturally must be prepared in a close interplay with the overall strategy of the enterprise as well as its objectives for other areas.

Questions for clarification of the area:
- Which objectives are laid down for environmental cooperation with suppliers/customers?
- Which elements must be considered to ensure optimum benefit from the cooperation?
- How to ensure continuity and development of the cooperation?
- How to link preferences from different stakeholders (customers, shareholders, authorities etc.)?
- What is the interplay with other objectives of the enterprise?
- How to operationalise the strategy?

1.5.3 Organisation of environmental cooperation

To have the optimum benefit from the cooperation in the product chain it is important to have a focused prioritisation of both cooperators and areas of effort. In addition, there are a number of questions on the actual organisation of the cooperation that should be clarified. For many enterprises exchange of experience in networks (region, sector or ”value chain”) may be profitable, allowing for example for dissemination of different tools for supplier assessments etc.

Questions for clarification of the area:
- What are the objectives for the cooperation?
- How to ensure continuous development of the cooperation?
- How to identify cooperators?
- Requirements or dialogue – advantages and disadvantages?

- Planning of communication – sales department, development department, laboratories?
- Determination of distribution of responsibilities among the enterprises?
- How to achieve clear and unambiguous communication on environmental issues?

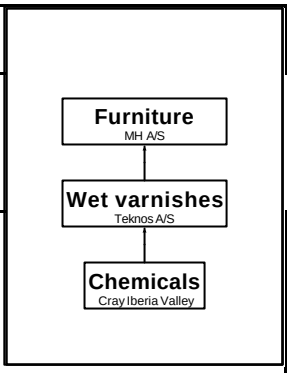
1.5.4 Information

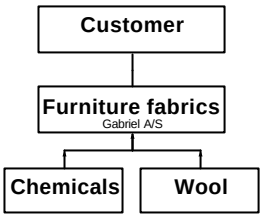
Information is a key concept in environmental product chain cooperations. This goes for both internal communication among the different departments in the enterprise and for communication with external parties.

Questions for further clarification:
- From Green Accounts to more detailed knowledge – which information is necessary?
- How to prioritise and focus information in the enterprise?
- What communication tools are applicable?
- Bottlenecks in relation to more detailed product knowledge?
- How to enhance dialogue with suppliers (for example long-term contracts)?
- Common language, how to provide the right information, how to generalise experience from different cooperations, for example Danish/foreign, certified/non-certified, large/small, sector characteristics?
- How best to inform consumers on environmental advantages?
- How to ensure access to new knowledge?
- Does the enterprise have sufficient capacity for applying new knowledge?

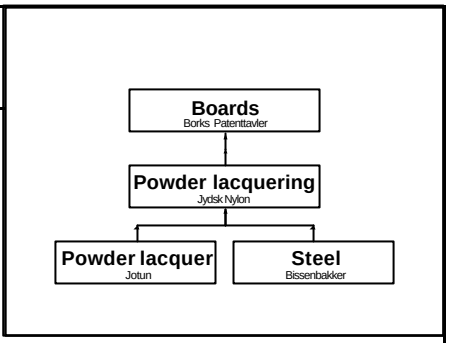
2. The 25 product chains

Enterprise	**1. Teknos A/S** Manufacturer of wet varnishes and powder varnishes
Start phase	The environment and quality manager saw some opportunities for the enterprise. The enterprise had worked previously with other environmental projects, including a large LCA project on a lacquer, so it had experience in the area.
Product chain	One customer (MH A/S – furniture manufacturer) and one supplier (Cray Iberia Valley – chemicals manufacturer) of Teknos A/S took part in the cooperation. They were chosen partly due to their interest in their own environmental issues and their interest in working with LCA, and partly due to personal relationships. A working group was established in each of the three enterprises, and a number of seminars were organised to build the necessary competence in connection with the preparation of an LCA for the selected lacquer as well as chairs and tables. On the basis of a wish expressed by MH Møbler the aim of the cooperation was to obtain a license for the Swan label for school furniture.
Environmental cooperation	Driving forces in the environmental cooperation: • Personal relationships • Commitment – a pioneer who could sell the project to the management and a support base of committed staff • Backing from management • Common language – only opportunity for cooperation with foreign suppliers was a Spanish enterprise with a Danish staff member • External consultant assistance – with general view and new inputs • Sufficient time is a good thing – it is very time-consuming to provide data for LCA. • Financial support was a motivating factor (opened up for testing ambitious projects) • Unambiguous and clear communication, with dead-lines for delivery of data etc. • Continuous development of training concept adapted to individual needs Barriers to environmental cooperation: • Lack of knowledge with suppliers (it was difficult to be "ahead of your time" and require data that suppliers do not have easily accessible). This also led to additional time consumption • Product confidentiality, provision of data is limited for competitive reasons • Lack of personal contacts – particularly with foreign suppliers, where communication takes place through contact person – thereby collection of data became far more burdensome (impossible, in some cases) • The EDIP PC tool was very sophisticated and had errors and defects – therefore not possible to use for non-specialists
Environmental achievements	Possible environmental 'hot spots' were identified in the different components in the product chain that could be subject to further scrutiny. In addition, cooperation among the enterprises was enhanced.
Perspectives	Teknos A/S sees enterprises manufacturing for the public market as potential partners for future cooperation. MH A/S wishes to establish corresponding cooperation with suppliers of wood and steel. Cray Iberia Valley does not want to be proactive, but will give positive response to future enquiries
Remarks	Customers set requirements in relation to the Danish Environmental Protection Agency's purchasing guidelines
Consultant	COWI



Enterprise	**2. Gabriel A/S** Manufacturer of furniture fabrics	
Start phase	Based on an enquiry from a consultant Gabriel became interested in an LCA project, and an application for support to the project was submitted to the Danish Environmental Protection Agency. Gabriel was motivated partly as work took place as an integral part of their own environmental management system, partly due to customer requirements.	
Product chain	Under the cooperation a number of sub-suppliers were to provide documentation for the preparation of the LCA: A dye and three surface-active substances were assessed in detail by a large chemicals supplier, and a supplier of woollen fabric provided data on environmental impacts in the manufacture of wool. In connection with the further work in the product chain sales staff of the enterprise supplied information on environmental issues to customers. According to Gabriel the environment is an important parameter among customers. Environmental issues are included in Gabriel quotations, and the enterprise sets requirements to own suppliers on full documentation.	
Environmental cooperation	Driving forces in the environmental cooperation: • Commitment of involved contact persons • Top management backing • Communication of concrete environmental advantages on customer demand • Formalisation of environmental system for written procedures etc. And communication to customers has been a strong asset in customers' comparison with other possible suppliers • Recognition of own limitations and use of consultant assistance – outsourcing • Building of own environmental competence liable to reflect customer demands. Got inspiration from main customers to ensure a frontrunner position • Broad knowledge in the enterprise (through environmental management system) so that every staff member was able to take questions and refer to the right person • Precise division of work upon customer calls so that questions could always be answered • Financial support opened up for engagement in difficult environmental projects. • Sales staff's personal contact to customers gave a good grasp of customer needs Barriers to the environmental cooperation: • Lack of knowledge with suppliers • Suppliers' fear for competitors when data are requested (particularly in the chemical industry) • Some customers demanded phased-out (toxic) products – in such cases Gabriel sought to persuade customers to the benefit of the environment, avoiding compromises with own environmental objectives	
Environmental achievements	Gabriel A/S, in connection with the project, became aware that some of the dyes purchased contain lead, which led to requirements from Gabriel for substitution. In addition, Gabriel's environmental cooperation with suppliers was formalised.	
Perspectives	Due to customer demand for documentation on environmental issues, Gabriel will use the EU eco-label, the Flower.	
Remarks	Gabriel sees a demand from customers in Norway, Sweden and Germany. When an environmental cooperation is started, often a closer cooperation is the result, which is an advantage in its own right.	
Consultant	COWI	

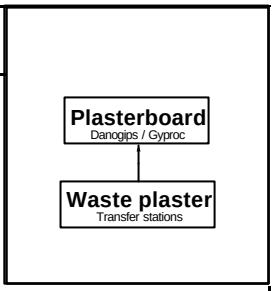
Enterprise	**3. Jydsk Nylon** Carries out sand blasting, phosphating and lacquering
Start phase	Jydsk Nylon experiences increased demand for information on environmental issues from customers (in particular foreign customers and in Denmark public purchasers). To handle this demand from customers a cooperation was started with two suppliers and a customer on coordination and communication of environmental information. Subsequently, support was applied for from the Environmental Competence Scheme.
Product chain	A product was chosen as a case for the development of a model for answering customer calls. An LCA screening of product components formed the basis for further work on communication of most essential environmental impacts from the product life-cycle. The cooperation among the four medium enterprises took place with consultant assistance.
Environmental cooperation	Driving forces in the environmental cooperation: • Financial support made way for development work • Management commitment, primarily motivated by customer calls Barriers to the environmental cooperation: • The modest size of the enterprise set limits to the scope of environmental requirements for suppliers • Requirements for written documentation hampered the project – enterprises found (due to their size) that written procedures were burdensome/unnecessary. • The EDIP PC tool was abandoned as it was too complicated for LCA screening, and there was a lack of workable tools
Environmental achievements	The environmental cooperation was not completed upon reporting of the example, and therefore it was not possible to take stock of direct environmental results. However, the cooperation has led to a closer relationship among the participating enterprises. Among others, to build up internal competence for the environmental cooperation Jydsk Nylon has introduced an ISO 14001-based environmental management system that has reduced environmental impacts from the enterprise itself, for example through a large reduction in electricity consumption and a significant drop in the consumption of trichloroethylene.
Perspectives	Jydsk Nylon intends to develop a website with product information to be used by customers and suppliers.
Remarks	
Consultant	COWI



Enterprise	**4. Post Danmark** Transport sector
Start phase	Under Post Danmark's efforts for open dialogue with customers one of the initiatives was an environmental assessment tool on Post Danmark's website in order to be a frontrunner in the environmental field and as a reaction to customer's demand for the environmental profile of the transport service.
Product chain	Customers were given the possibility of calculating environmental impacts in the form of contributions of CO_2, SO_2 and NO_x based on type of dispatch, whereas direct environmental impacts were not stated. Post Danmark found that it had a positive effect on customers, and at the same time Post Danmark was able easily to state environmental impacts in connection with tenders etc. This image had an impact on both customers and staff.
Environmental cooperation	Driving forces • Specific demand for environmental information from customers • Environmental communication at the present time is directed at specialists, and further development of the tool will allow for broader use • Recurrent demands from customers supported the choice of Post Danmark to develop its profile as a frontrunner in terms of the environment Barriers • It has been difficult to find the link to the environmental assessment tool on the website of Post Danmark and consequently it has only been used to a limited extent • Large amounts of information have made it difficult to attract attention to the environmental information on the website • It proved to be difficult to create interest in the tool internally in the Post Danmark organisation
Environmental achievements	Demands from customers enhance Post Danmark's attention to its internal environmental issues
Perspectives	
Remarks	Often, customers demanded information on "something on the environment" without specifications. Post Danmark expected that it would push the enterprise more into the offensive if it was able to present an environmental profile.
Consultant	COWI

Enterprise	**5. DSB** Transport sector
Start phase	The environmental cooperation is found primarily in connection with purchasing, as since 1992 DSB has had a policy on environmental considerations in purchasing. With the "Circular on green purchasing in public institutions" from the Ministry of the Environment (1996) DSB efforts on green purchasing were systematised through environmental requirements for suppliers.
Product chain	Environmental requirements were prepared for purchasing in the form of minimum requirements, in some cases leading to a development cooperation with the supplier. DSB has worked systematically with an outline of chemicals consumption, and the policy has been prepared on the basis of the Danish Environmental Protection Agency's list of undesired substances. Environmental requirements are used in tendering, evaluation of proposals and entering of framework contracts.
Environmental cooperation	Tools: • Thorough dialogue with suppliers – leads to larger attention among suppliers. Catalysing effect • Organisation and division of work – opens up for prioritisation of a detailed effort in the right areas (e.g. in the renewal of framework contracts) • Environmental guidelines and eco-labels – are used when available • Visible politics and objectives – give clear expectations • Holistic approach – attention to the entire product life-cycle Driving forces: • Focus on green public procurement Barriers: • Lack of knowledge among suppliers and sub-suppliers – particularly among suppliers from Southern Europe or the East • The EDIP PC tool is too sophisticated and time-consuming – more useable tools are desirable
Environmental achievements	In the procurement of new S-trains LCA-screenings were made of different materials. For example, PVC flooring that was "the best choice" at first was replaced by artificial rubber, as PVC would cause problems upon waste disposal. Upon tendering of cleaning services two substances were identified as being problematic, and DSB entered into negotiations with the supplier on substitution. The supplier undertook product development, and phase-out of these substances within eight months from signature of the contract was set up as a precondition. A requirement for use of biodegradable lubricating grease was reconsidered after supplier reactions – the price was four times that of other greases. Based on new investigations DSB withdrew the requirement as after use the grease would be contaminated and have the same status as ordinary grease. In future, the biodegradable lubricating grease will be preferred, if prices go down. The results of DSB purchasing efforts are that the enterprise is in a position to comply with its own environmental requirements and, further, that supplier conscience on supply of environment-friendly services has increased.
Perspectives	
Remarks	Even if DSB would like to have suppliers setting requirements for sub-suppliers to improve the environmental profile of services, it is difficult to pass on the message. In reality, some suppliers refrain from submitting proposals for DSB assignments, as they are to demanding! DSB environmental efforts cannot be related to customer demand.
Consultant	COWI

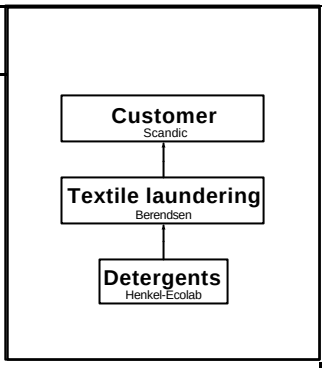
Enterprise	**6. Danogips A/S** Manufacturer of plasterboard
Start phase	For many years, Danogips has worked on a reduction of waste for landfilling from their own manufacture, and the enterprise has established a plant for recycling of production waste in new production. Further to a wish for returning demolished plasterboard from a large renovation project, Danogips took the initiative of developing a nationwide collection system for used plasterboard. The cooperation covered Danogips and Gyproc as well as two intermunicipal waste management companies.
Product chain	The cooperation led to a determination of common requirements for recyclable plasterboard at a detailed technical level. A geographic division of Denmark into west and east of the Great Belt was made, and in cooperation with the intermunicipal waste management companies a price for delivery of DKK200/tonne was agreed. However, local authorities assigning waste have only demonstrated very limited support.
Environmental cooperation	Driving forces • Commitment – different players with different motivation willing to take action • Financial advantages Barriers • Lack of commitment – from local authorities • Quality requirements – plaster must be clean • Lack of information
Environmental achievements	There has been poor backing of the take-back system, for example few municipal assignments of waste plaster. However, enterprises point out that positive experience has been gained from entering a formal environmental cooperation.
Perspectives	Danogips continues to work with the idea and has entered a cooperation with the demolition enterprise of Karsten Rasmussen on development of the collection system – primarily relating to logistics. The aim is to be able to collect also plaster covered with wallpaper or glass tissue, separating this and ensuring recycling of plaster.
Remarks	There may be a large need for external backing to support new systems. The results of the take-back system were limited by dependence of external parties (local authorities), having backed only to a very limited extent.
Consultant	COWI



Enterprise	**7. Danfoss Drives A/S** Manufacture of frequency converters for regulation of electric motors
Start phase	Danfoss started with the establishment of a database on constituents in their components in 1996, since – as part of their environmental management system – they wished to take back end-of-life products for delivery to a recycling enterprise. However, this required more detailed product knowledge. At the same time, Danfoss had an enquiry from a large customer, Tetra-Pak, who, based on a construction products directive in Sweden wanted a declaration of a number of chemical constituents. Recognising that such enquiries from customers might become more common, Danfoss Drives spent rather many resources on establishing the database.
Product chain	In connection with the establishment of the database Danfoss Drives has collected information from suppliers on constituents in the components. With Danfoss Drives a dismantling guideline is prepared, stating how to dismantle and recycle the product at the end of its useful life. Knowledge of components has furthermore been used in Danfoss Drives to prepare a designers' manual, ensuring consideration of environmental issues in the development of new products.
Environmental cooperation	Driving forces: • Demand from customers Barriers: • It may be difficult to collect information from suppliers – either because they cannot or will not inform on constituents • If the enterprise is of no strategic importance for the supplier, it is particularly difficult to set requirements
Environmental achievements	Better knowledge of products has opened up for development of environment-friendlier products, and future requirements – for example in the EU WEEE directive(s) – will be complied with easier.
Perspectives	Suppliers in a longer-term perspective will have to fill in data themselves for components delivered to Danfoss Drives. Later, the database will be used for more genuine LCA assessment with Danfoss Drives.
Remarks	Even if the trigger was demands from a customer the enterprise does not meet many customer requirements relating to the environment – perhaps due to lack of competing enterprises?
Consultant	dk-TEKNIK ENERGY & ENVIRONMENT, DHI Water and Environment, Valør & Tinge

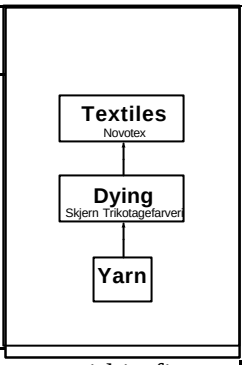
Enterprise	**8. Brødrene Hartmann A/S** Manufacturer of cardboard packaging
Start phase	Hartmann, on the basis of life-cycle assessments, has established a database used, among other things for showing customers the environmental profile of a packaging, depending on the customers' choice of colour, for example. This knowledge is used actively to enter into dialogue with customers on the environment in each individual sales situation. Brødrene Hartmann furthermore has developed a system for supplier assessment, in which suppliers through questionnaires assess their own position in relation to: networks, environmental management, cleaner technology, communication and training, and state their own most significant environmental impact. Furthermore, Hartmann purchasers have gone through a training course in the use of supplier assessments. Hartmann uses the tool for prioritisation of suppliers for dialogue, where suppliers with the largest "potential for improvement" are given most attention.
Product chain	The focal point of the cooperation is transfer of knowledge. Hartmann today holds data and knowledge resources that are superior to many others, due to their many years of experience in environmental optimisation, cleaner technology, environmental management and not least LCA. It is important to Hartmann to penetrate broadly into cooperator organisations so that they can enter into dialogue with the right decision-makers relating to the different environmental arguments. Hartmann presents environmental impacts from both own products and competitor products (primarily plastic packaging). Dialogue with customers is assumed by sales staff, communication and environmental specialists jointly, presenting both production, design, logistics and environment to customers. The task of Hartmann is mostly to train customers' non-environmentally specialised staff groups. Key-account managers from all of Hartmann's sales offices have joint meetings a number of times every year, and the environment is a permanent item on the agenda**.**
Environmental cooperation	The advantages of the environmental effort are: • New customers and increased sale to old customers • Learning process for the corporate environmental department • Customer interest removes barriers internally in the organisation • Sales work has become multidisciplinary • Hartmann passes on knowledge on the environment and packaging
Environmental achievements	Through dialogue with suppliers and customers it is sought to give packaging better environmental profiles
Perspectives	Influence and "training" of customers is important to make them understand both environmental consequences of their choice, and how they can use the environment themselves as a competitive parameter, to gain internal benefits etc.
Remarks	
Consultant	dk-TEKNIK ENERGY & ENVIRONMENT, DHI Water and Environment, Valør & Tinge

Enterprise	**9. Berendsen Tekstil Service** Textile laundering
Start phase	Berendsen and Henkel-Ecolab have entered a seven-year framework agreement for supply of chemicals and service to the laundries of Berendsen. One of the essential motivations for the cooperation is found in the Scandic Hotels, one of Berendsen's large customers. Scandic (in Sweden) in 1994-95 requested that detergents complied with environmental requirements of the Swedish environmental label 'Bra Miljöval'.
Product chain	Under the agreement Berendsen must buy detergents from Henkel-Ecolab and Henkel-Ecolab is committed to supply at competitive prices. Furthermore, Henkel-Ecolab must deliver dosing equipment for the Berendsen laundries. The cooperation covers for example: Optimisation and standardisation of laundering formulas and common objectives for environmental and health criteria for chemicals.
Environmental cooperation	Driving forces: • Demand from important customer • Focus on direct communication with laundries in which also service agreements and minimisation of wear have become central issues Barriers: • Laundries have been reluctant to change practice
Environmental achievements	The aim is to substitute substances with undesired properties in detergents. Results are summarised as • Common problem solving • Confidence and technological development • Henkel-Ecolab extends their environmental management system to cover customers • Further dialogue in product chain
Perspectives	A development potential is found in the direct dialogue between Henkel-Ecolab and Scandic (today communicated through Berendsen), where, for example, a reduction in the amount of damp-stained textiles may reduce the use of bleaching agents.
Remarks	Confidence among the enterprises is ensured with a seven-year agreement, and it is a precondition for obtaining knowledge of constituents from the chemicals supplier.
Consultant	Dk-TEKNIK ENERGY & ENVIRONMENT, DHI Water and Environment, Valør & Tinge

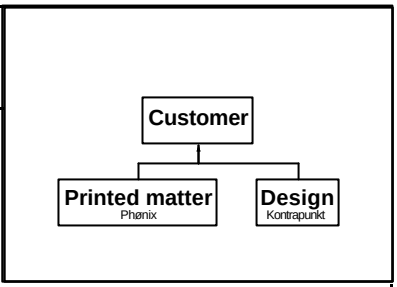


Enterprise	**10. Akzo Nobel Deco** Manufacturer of coatings
Start phase	On the basis of attention from the media, Akzo Nobel Deco at its own initiative started work on substitution.
Product chain	Paints for professionals are divided into three categories: a. may be used by pregnant women b. may be used by pregnant women under particularly favourable conditions c. may not be used by pregnant women. These requirements are directed at substances evaporating during painting work and thus constituting a working environment problem, but not at substances that are problematic, for example, upon discharge into the aquatic environment. Akzo Nobel Deco in cooperation with, among others, Perstorp and P. Brøste has worked on substitution of an undesired group of substances (APEO) and, furthermore, in cooperation with the paints trade sought to develop paints that can be used by pregnant women (category a). It has been a precondition for the cooperation with raw material suppliers that there is confidence and confidentiality, since formulas for constituents are kept secret to competitors.
Environmental cooperation	Confidence among enterprises on confidentiality regarding formulas and constituents has been decisive for the cooperation. By focusing on substitution of individual substances there is a risk of them just being substituted by substances that may be just as problematic. Therefore, the cooperation has concentrated on avoiding undesired properties in the product instead of substitution of single substances. Attention from the media/customers/authorities is one of the reasons why Akzo Nobel wants to be an environmental frontrunner. Occupational health requirements from the paints trade are met through joint development cooperation.
Environmental achievements	Akzo Nobel Deco for the past five years has substituted more than 90% of the undesired group of substances APEO from their water-based paints. Contents of VOC, residual monomers etc. have been reduced currently in cooperation with the occupational health service for the paints trade.
Perspectives	Today, Akzo Nobel Deco seeks to be ahead of requirements/pressure from the media, authorities or customers through their "product stewardship" programme. The Akzo Nobel corporate management and Akzo Nobel Deco in cooperation determine environmental objectives within areas such as eco-labelling, classification for danger to the environment, reduction of VOC contents etc. Akzo Nobel Deco has a mutually beneficial cooperation with the occupational health service for the paints trade on development of paints to be used by pregnant women.
Remarks	Akzo Nobel focuses on undesired properties and have a target for the VOC contents of products, just as there are also objectives for products not needing labelling for danger etc. A requirement for suppliers on complete declaration of chemical products is considered as unrealistic, as constituents are the most important competitive parameter.
Consultant	Dk-TEKNIK ENERGY & ENVIRONMENT, DHI Water and Environment, Valør & Tinge

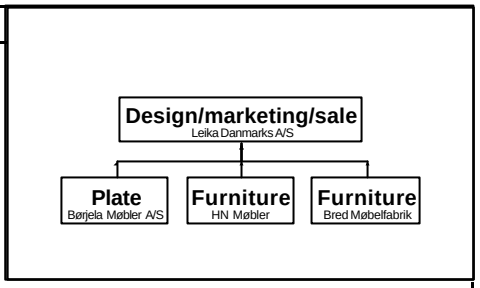
Enterprise	**11. Novotex** Manufacture of environment-friendly textiles
Start phase	Skjern Trikotagefarveri (fabric dying) at a sales meeting at Novotex brought forward the idea of substituting formaldehyde in textile treatment. Novotex identified a Greek enterprise supplying yarn not requiring formaldehyde treatment. This triggered the manufacture of Novotex' Green Cotton. Novotex now sets requirements for all suppliers, ensuring that Green Cotton products have an environmental advantage in all respects.
Product chain	Novotex sets requirements for nine stages in the textile manufacture within five categories: Environmental management, life-cycle, communication, manufacture, product. The relationship with suppliers has developed in the process, from suppliers in the beginning being very willing to supply documentation and quoting good prices to have Novotex as a reference. Later, it became more difficult to get documentation, and Novotex has had to pay for some analyses. At the same time, the number of suppliers has increased as the product range has been extended. Novotex has concentrated on fewer suppliers and today has mainly Danish suppliers who respond to enquiries and follow developments more quickly. A need emerged for a PC tool for supplier assessment in this context.
Environmental cooperation	It is Novotex' experience that it is easier to set requirements for Danish suppliers than for foreign suppliers. In addition, it has been an advantage to have fewer suppliers, making Novotex a larger customer and thus facilitating requirement compliance.
Environmental achievements	• Development and marketing of Green Cotton • Documentation of environmental performance of suppliers and deliveries (Novotex has developed a tool for assessment of environmental performance of suppliers and deliveries)
Perspectives	Novotex plans to develop other types of environment-friendly textiles (for example viscose, polyester etc.). Customers must be convinced of the value of eco-labelled clothes, and environment-friendliness must be extended to also cover ethical guidelines – staff management in the entire product chain.
Remarks	Most Green Cotton products comply with criteria for eco-labelled textiles.
Consultant	dk-TEKNIK ENERGY & ENVIRONMENT, DHI Water and Environment, Valør & Tinge



Enterprise	**12. Phønix-Trykkeriet A/S** Supply of designed, environment-friendly printed matter.
Start phase	Kontrapunkt, a graphic design shop, wanting a printing shop with a good environmental profile, identified Phønix. This combination has ensured orders from large, environmentally conscious customers.
Product chain	Kontrapunkt has set many difficult requirements, but Phønix was prepared to solve tasks in cooperation with Kontrapunkt. Printed matter complies with criteria for the Swan eco-label. Phønix got access to large customers through Kontrapunkt. Phønix is involved in the design phase to contribute with environmental knowledge. Both parties are also involved in sales work, and the enterprises make joint proposals for tenders. Today, more suppliers are able to deliver corresponding environment-friendly solutions, and therefore the competitive parameter in future will be ”services”.
Environmental cooperation	Results: • Increased sale and new customers • The cooperation with Kontrapunkt has been one of the catalysing effects for the Phønix sales strategy • Kontrapunkt designers have acquired better environmental competence • The cooperation as such has led to better results – less wastage due to misunderstandings
Environmental achievements	
Perspectives	
Remarks	
Consultant	dk-TEKNIK ENERGY & ENVIRONMENT, DHI Water and Environment, Valør & Tinge

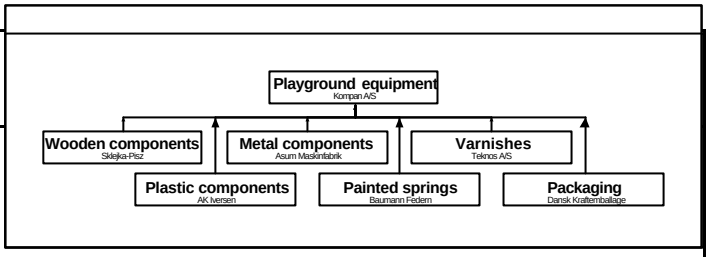


Enterprise	**13. Leika Danmark A/S**
Start phase	In cooperation with three furniture suppliers Leika Danmark A/S set up an objective of presenting a collection of eco-labelled (the Swan) furniture in the 2002 catalogue. All parties have given their consent, and Leika expects that work on documentation will be reduced once all suppliers can deliver Swan-labelled products.
Product chain	With support from an external consultant, enterprises cooperate on providing documentation and developing products, so that they can achieve the Swan label license. Suppliers get the Swan label license, whereas Leika owns the drawings for the furniture.
Environmental cooperation	Driving forces: • Expectations for new market • Swan labelling is an extension and enhancement of the cooperation between Leika and its suppliers. • Public purchasers demand a green profile Barriers: • Small suppliers may find it difficult to provide documentation on environmental issues • Despite customer demands for environmental issues there is some doubt whether it actually is a parameter in the choice of products
Environmental achievements	Development of furniture collection complying with Swan label requirements
Perspectives	If the new furniture finds a satisfactory market the parties will probably develop more Swan labelled furniture.
Remarks	
Consultant	dk-TEKNIK ENERGY & ENVIRONMENT, DHI Water and Environment, Valør & Tinge

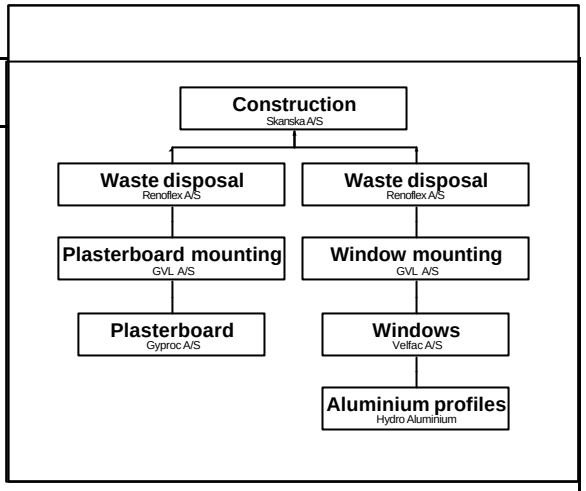


Enterprise	**14. The Danish Centre for Resource Saving Concrete** Manufacture and establishment of cement/concrete structures
Start phase	At the initiative of the Concrete division at the Danish Technological Institute the Danish Centre for Resource Saving Concrete was established. The centre is financed partially by the Danish Agency for Development of Trade and Industry.
Product chain	The purpose of the centre is to establish a platform for dialogue among the parties on development of environment-friendlier products. Suppliers, manufacturers, experts and purchasers of concrete are represented in the centre cooperation. A number of projects are carried out on, for example, design, material substitution, communication and the construction of a "Green Bridge".
Environmental cooperation	The parties expect that the Danish cement and concrete industry obtains an international competitive advantage through the cooperation. Aalborg Portland and Unicon experience increasing interest for environmental and occupational health issues, and they have a current dialogue with their suppliers on constituents.
Environmental achievements	Resource optimisation and substitution of environmental contaminants. Increased recycling of residual products.
Perspectives	The centre increases the opportunity for comprehension and dialogue on both technical and environmental problems in the product chain. Through the partial formalisation of the cooperation it becomes clear to participants, which opportunities are available to each single party for exerting an influence on his or her part of the product chain. This also increases the opportunities for joint influence.
Remarks	Aalborg Portland and Unicon cooperate with the European organisation for the cement and concrete sector on life-cycle analyses and with Nordic partners on a contribution to developing a concept for Nordic environmental product declarations. Knowledge gained through this work benefits the other enterprises in connection with assessments of possibilities for substitution and environmental consequences of substitution.
Consultant	dk-TEKNIK ENERGY & ENVIRONMENT, DHI Water and Environment, Valør & Tinge

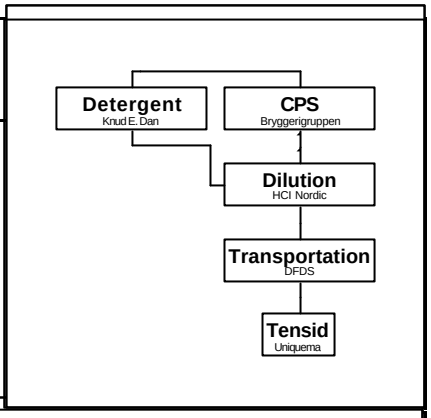
Enterprise	15. KOMPAN A/S Manufacturer of play-ground equipment
Start phase	KOMPAN has an objective of reducing its environmental impact and improving the environmental profile of products. KOMPAN delivers to demanding markets and wishes to maintain and develop a high environmental profile. The enterprise therefore on several occasions has entered concrete cooperation with suppliers. KOMPAN has a policy of assessment of suppliers' quality and environmental issues, however without specific objectives for the cooperation.
Product chain	Suppliers are assessed on quality and environment. Strategic suppliers involved in the product chain analysis have delivered to KOMPAN for several years and have, for a number of years, cooperated on quality and reliability of delivery. In recent years, also environmental issues have been part of the cooperation. Suppliers' production in many cases is planned for requirements for KOMPAN products, and thus there is a "mutual dependency". Cooperation between KOMPAN and suppliers takes its starting point in KOMPAN products, whereas from a narrow point of view there has not been focus on reducing suppliers' environmental impact. KOMPAN expects that as a reaction to enquires for environmental issues, suppliers will develop in this field in their own right.
Environmental cooperation	Driving forces: • Enterprises have mutual benefit from the environment work/development, when they want to raise their profile relating to the environment and quality • Information on KOMPAN environment profile to suppliers has led to suppliers supporting the KOMPAN environmental profile whenever possible at their own initiative • A relationship of confidence with suppliers in general gives a better basis for dialogue • Enquiries for environmental issues – for example from customers in Germany
Environmental achievements	• PVC is phased out in the entire product chain • Waste plastic is recyclable - supplier innovation • One supplier suggested the phase-out of cadmium in dying of a plastic component, subsequent to another customer of the supplier having caused this change. • KOMPAN has required from suppliers that all products comply with the European standard EN 71-3. One supplier has passed on this requirement to sub-suppliers. • One supplier has included a test for heavy metal contents in sub-suppliers' products as part of their own environmental management system • KOMPAN establishment of afterburning was developed partly in cooperation with a varnish supplier • Reduced wastage in the KOMPAN varnishing process in cooperation with supplier • A development cooperation between KOMPAN, Teknos and a sub-supplier has caused varnishes to be more environment-friendly and durable. • Based on KOMPAN focus on own emissions, there is a wish for high dry matter contents in varnishes, and Teknos has developed and reduced its own emissions concurrently • Deliveries to KOMPAN from several suppliers take place in returnable packaging causing less waste with KOMPAN
Perspectives	The close cooperation opens up for assessing environmental issues relating to a product on a life-cycle basis – and focusing efforts where environmental perspectives are the largest.
Remarks	
Consultant	PlanMiljø

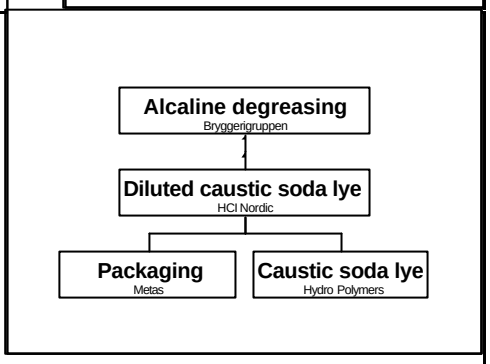


Enterprise	**16. Skanska Danmark A/S** Contractor
Start phase	The Skanska Danmark A/S quality, environment and working environment system has three areas of effort: Waste, chemicals and energy. In addition to requirements for suppliers of products, Skanska also sets requirements for suppliers of services at construction sites, such as carpenters and waste haulers.
Product chain	The standard conditions for cooperation with Skanska cover an environmental section dealing with: - Registration of chemicals (Skanska divides chemicals into three lists: black list, phase-out list and positive list) - Waste, particularly rules on cleaning-up - Dust, noise etc. - Excavation and removal of soil Suppliers' quality and environment plan must be approved by Skanska before work is started. Skanska has no fixed criteria for selection of suppliers, but in connection with selection it is described which criteria are included in the selection. For small suppliers guidelines are set up in preparation of quality and environment plans.
Environmental cooperation	Driving forces: • Suppliers point out that personal relationships are important for dialogue – on replacement of personnel "delays" occur in the cooperation. • Skanska's system is capable of managing special environmental requirements/wishes from customers throughout the product chain Barriers: • The heavy demands from Skanska may reduce the number of interested suppliers • In the sector, suppliers are sometimes competitors for the same assignments, and this puts its mark on the environmental dialogue, as environmental issues are a competitive parameter.
Environmental achievements	• Recyclable plaster - cooperation with Gyproc (incentive from Skanska is both financial and future-oriented in relation to future rules and in view of environmental profiling, whereas Gyproc does not benefit from financial savings, but prioritises environmental profile and development of cooperation with a good customer) • Increased recycling – in cooperation with Renoflex attention is paid to increased recycling at construction sites • General environmental impact – policy on environmental certification of acquired enterprises within two years and participation in a number of development projects. Environmental impacts have not been assessed.
Perspectives	Further environmental achievements can be reached by Skanska setting up simple objectives for selected, significant products, services and suppliers.
Remarks	
Consultant	PlanMiljø



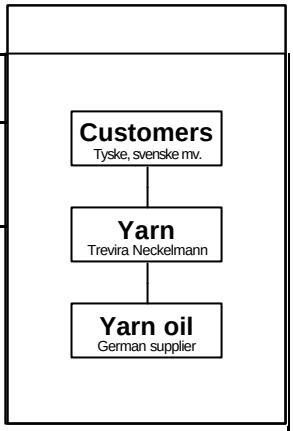
Enterprise	**17. HCI Nordic A/S** Distributor of chemical feedstock
Start phase	In connection with, among other things, environmental requirements from a large supplier HCI Nordic has entered an environmental cooperation with suppliers and customers processing HCI semi-products.
Product chain	HCI's objectives for the supplier/customer cooperation are: • that environmental issues are included in the assessment of suppliers • to development environment-friendlier products in cooperation with customers/suppliers • to pass on information on environment, health and safety aspects of the products There is much focus on handling of products, and HCI seeks to help customers in "correct" handling and use.
Environmental cooperation	Driving forces: • There is much environmental attention directed at the sector, and any accidents with chemical substances, for example upon transportation and use will damage the entire product chain. Therefore, a generally positive attitude is met with respect to environmental dialogue • Many years of confidence with suppliers and customers makes way for a good climate for the environmental cooperation Barriers: • It may be difficult to set requirements for and exert an influence on suppliers, as HCI often has no significant strategic importance for suppliers • HCI "depends" on its suppliers with special deliveries where there are no immediate alternative suppliers • Often HCI is committed through long-term contracts – in some cases entered by the parent company in the Netherlands
Environmental achievements	• Development of pallet tank reducing wastage – launched as a stand-alone cooperation project • Development of logistics relating to manufacture and sale of caustic soda lye • Influence on suppliers relating to introduction of environmental management
Perspectives	A prioritisation of environment work towards suppliers based on the principle of "more environment for the effort" may enhance the environmental benefit from the product chain cooperation.
Remarks	
Consultant	PlanMiljø



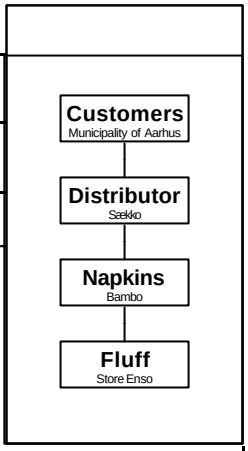


Enterprise	**18. H+H Fiboment A/S** Manufacturer of concrete and porous concrete
Start phase	The enterprise wishes to stand out as a frontrunner with development of sustainable production methods, and consequently it opted in on a project on development of environmental product declarations. The project took place in cooperation with other concrete manufacturers and was supported by the Danish Agency for Development of Trade and Industry and the Danish Environmental Protection Agency. Other concrete materials were well-documented, and the sector called for corresponding documentation for light clinker concrete.
Product chain	The report describes H+H Fiboment's work on the environmental product declaration that may be used in the long-term perspective as a basis for environmental cooperation in the product chain.
Environmental cooperation	Driving forces: • The wish of the industrial organisation for being a frontrunner was crucial • The enterprise's wish for being able to provide an environmental product declaration • Expert assistance from consultants • Pioneer in the enterprise Barriers: • Environmental product declaration cannot be compared in a clear manner with other environmental product declarations • Existing tools are too complicated – too many data have to be entered, causing errors and frustrations • Lack of knowledge of usefulness of environmental product declarations • No standard for lay-out of environmental product declarations
Environmental achievements	Data have been compiled that may form the basis for the preparation of an environmental product declaration
Perspectives	The environmental product declaration may be used in the selection of areas for effort in a product chain cooperation and as documentation to customers
Remarks	
Consultant	COWI

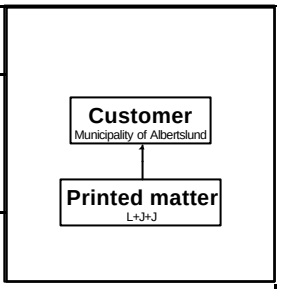
Enterprise	**19. Trevira Neckelmann A/S** Processing and dying of textiles
Start phase	Due to demands and requirements from customers Trevira Neckelmann became interested in developing a bio-oil for yarn processing.
Product chain	Trevira Neckelmann entered a cooperation with suppliers on development of an environment-friendly yarn oil complying with the following conditions: • Thermo-stable, i.e. oil is not released to the air upon heating in the processing of yarn (customer requirement caused by more stringent legislation in German and Austrian states) • Substances discharged to sewer must be biodegradable (German, Swedish and Czech customers having legislative requirements to this effect) Volvo set requirements for removal of NPE (washing agent)
Environmental cooperation	Driving forces: • Building of environmental knowledge making way for comprehension of customers' diffuse enquiries • Top management backing – confidence in profitability of environmental measures • Finances - confidence in profitability of environment work • Requirements from authorities • Structure in projects – important with a "good approach" to best achieve results • Strong cooperators • Designation of contact persons – quick action and coordination • Personal competencies with contact person Barriers: • Internal difficulties between departments with cooperator
Environmental achievements	Today the enterprise can deliver an environmentally optimised product that is being further developed to live up to the Flower criteria. Thus, German, Swedish and Czech customers have been kept. In addition, building of knowledge with German sub-supplier.
Perspectives	Trevira Neckelmann is in contact with several possible cooperators on development of more environment-friendly products.
Remarks	Customer requirements have led to product development. Trevira does not find it decisive whether cooperators are Danish or foreign. Corporate culture is more important.
Consultant	COWI



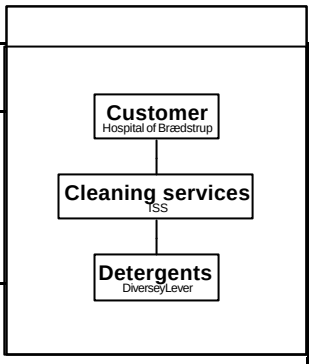
Enterprise	**20. Bambo** Manufacture and sale of Swan-labelled napkins
Start phase	In 1994 Bambo started manufacture of eco-labelled napkins in expectation of demand for such a product.
Product chain	From the manufacture of a paper product (fluff) for the napkins to the extension of the purchasing portal to also cover environmental issues focus was put on improvement of napkins' environmental profile. Upon sale, guidelines are given for optimum use of napkins. Stora Enso delivers Swan-labelled fluff, whereas Sækko sells napkins to public customers. In connection with Bambo Swan label licenses the enterprise has entered a committing cooperation with Stora Enso on supply and technical and environmental product development.
Environmental cooperation	Driving forces: • Green profile in public purchasing • The Swan label visualises customers' green purchasing Preconditions: • Same view on environmental issues among enterprises in the Nordic countries • Sækko's direct customer contact using, for example, nurses in the contact with nursing homes Barriers: • With the exception of Nordic customers, lack of knowledge of the Swan label among customers • The EU eco-label, the Flower, has no criteria for napkins. • It is around 4% more expensive to manufacture Swan-labelled napkins
Environmental achievements	Apart from the product improvement no result of the environmental cooperation is described.
Perspectives	Efforts are made to reduce the use of synthetics, improve exploitation of the wood resource, increase user-friendliness – for example in view of humidity indicators.
Remarks	Public purchasers with increased focus on environmentally optimised products play an important role as catalysts. Cooperation among the different links in the product chain is decisive for how easy it is to profile the product (provision of documentation etc.). Eco-labelling is not an unconditional success, when customers (particularly foreign) are not familiar with the labels.
Consultant	dk-TEKNIK ENERGY & ENVIRONMENT, DHI Water and Environment, Valør & Tinge



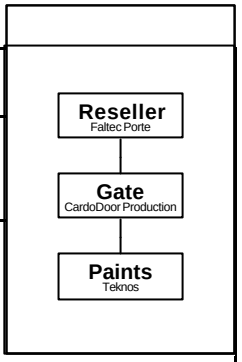
Enterprise	**21. Levison+Johnson+Johnson A/S** Printing shop
Start phase	Levison+Johnson+Johnson sets high requirements relating to quality and the environment, and the enterprise in several cases has been the catalyst of customers making environment-friendlier choices in their purchase.
Product chain	LJJ asked the Municipality of Albertslund to include environmental issues in their purchase of printed matter. The Municipality of Albertslund includes the environment to the same extent as price, quality and reliability of delivery in their purchase. For example, for printing jobs, the municipality only invites for tender environmentally certified printing shops having an eco-label license. LJJ's environmental manager is often in direct dialogue with suppliers on environmental issues.
Environmental cooperation	Driving forces: • Public purchasers are under the duty to include environmental considerations • The Swan label is an easy choice for customers wanting a green profile • The Swan label is chosen by some customers due to clear signal value of the label • Close cooperation among environmental department and sales department at LJJ is a strength for the sale of environment-friendly products Disadvantages of the Swan label: • Unknown south of Denmark • Some opt out due to ugly design • Some opt out due to slight additional cost (0.4%) • Not all find it necessary as a signal to customers
Environmental achievements	Environmental achievements have not been quantified, but Swan-labelled printed matter guarantees that environmental impacts do not exceed a certain level per unit.
Perspectives	LJJ wishes to further develop their sales work to have customers making environment-friendlier choices. For example, it is being considered whether the Swan label should be standard on printed matter unless customers reject it.
Remarks	
Consultant	dk-TEKNIK ENERGY & ENVIRONMENT, DHI Water and Environment, Valør & Tinge



Enterprise	**22. ISS Danmark** Cleaning contractors
Start phase	DiverseyLever and ISS since 1997 have cooperated on cleaning solutions optimised in terms of the environment and quality. Formalised cooperation on cleaning systems deals with the environment, quality, ergonomics and financial issues.
Product chain	ISS and DiverseyLever has a strategic cooperation agreement worldwide, and enterprises in Denmark and the Nordic countries cooperate on having the Swan-labelled Nordic Line products included in the global product catalogue of ISS. Eco-labelled products thus may be spread to the further global cleaning activities of ISS. A substantial part of environmental impacts from cleaning activities is found with the final customer, so environmental management in this link is essential.
Environmental cooperation	Driving forces: • Environment-friendly products are sold on a strategy with emphasis also on simplification through cleaning methods, transportation, packaging etc. • Direct contact among technicians at DiverseyLever and local staff with ISS creates confidence and a good climate for developing cleaning systems • This contact gives good response in testing of new products Barriers: • Offhand, only Nordic enterprises wish to include environmental concerns in the competitive strategy. Globally, focus is primarily on price and former amounts purchased • Professional customers as a starting point are ”conservative”, and it takes much sales work to convince customers that, for example, perfume and dye in detergents can be dispensed with The turnover fee on the Swan label (0.4%) is a strain for DiverseyLever, and as a consequence the enterprise only has one Swan-labelled product in each product group, even if more products could actually be labelled
Environmental achievements	ISS in a special environmental effort at the hospital of Brædstrup has reduced water consumption by 70%, halved chemicals consumption and reduced waste arisings from cleaning to one third. Swan-labelled products are on the increase in the global ISS group.
Perspectives	Development of the Nordic product series may be used for a more environment-friendly development on other markets. DiverseyLever and ISS can enhance the product chain cooperation in future through systematic formulation of targets and plans of action with their cleaning service customers.
Remarks	Global groups may extend environment-friendly products across borders through harmonised product ranges.
Consultant	dk-TEKNIK ENERGY & ENVIRONMENT, DHI Water and Environment, Valør & Tinge



Enterprise	**23. CardoDoor** Environmental product declaration for gate
Start phase	The report describes the background for preparing an environmental product declaration in a dialogue among three enterprises.
Product chain	The report is a pilot project for development of an environmental product declaration for a gate. The example demonstrates how to handle an environmental product declaration so that the manufacturer is enabled to compare different products from suppliers and thus assess his own environmental impact. At the same time communication of information to the next link in the chain is made possible. If everybody follows the same standard for declaration it is easier for parties to compare and communicate product properties.
Environmental cooperation	Teknos' experience with the EDIP PC tool is that it is not possible to compile sufficient data and thus to make a complete environmental product declaration of products. This is particularly problematic in the chemical industry, where constituents and processes are kept secret from competitors (Example from Teknos with data collection through the EDIP PC tool gave 3-10% of necessary data). It has proved considerably easier to work with the Swan label, setting limits in relation to specific environmental impacts.
Environmental achievements	
Perspectives	Declaration of gates primarily will deal with use of solvents and undesired substances in paints, as well as waste management. Gates are made from aluminium, iron, plastic and insulation material. There is no eco-labelling available, and to find relevant criteria the starting point has been taken in criteria for the Swan and the Flower and in the list of undesired substances.
Remarks	
Consultant	PlanEnergi



Enterprise	**24. DAN-RENS A/S** Service and trade within graphic and pharmaceutical industries
Start phase	DAN-RENS has drawn up a purchasing policy where all products are assessed in view of environment, working environment, financial issues and technique. In continuation of this DAN-RENS wishes to create a dialogue with their suppliers.
Product chain	The enterprise focuses on logistics and optimised haulage, for example on take-back of chemicals from customers. Customers get response on their ability to separate waste and on annual waste arisings.
Environmental cooperation	Driving forces: • There is good dialogue with enterprises introducing environmental management under ISO 14001 or developing products for Swan label license • Customers with a positive attitude to environmental dialogue are used to test new products • Customers are guided in separation and labelling of waste Barriers: • There is a reasonably good dialogue with Danish suppliers, whereas Southern European suppliers in particular have no focus on the environment • Preparation of LCA for a product may be so time-consuming that it is technologically outdated before the analysis is completed • Despite requests, no suppliers came forward with information on development of environmentally less harmful products • It is difficult to ”translate” different waste codes in different countries – the European waste codes have not penetrated • Denmark’s special rules imply that several goods must be reclassified on importation • Danish rules for labelling of waste are complicated, and customers return waste that is incorrectly labelled • Despite recognition for their environmental efforts DAN-RENS experiences that public customers select cheaper suppliers with lower environmental profile • It is pointed out that Danish environmental legislation is difficult to handle
Environmental achievements	
Perspectives	
Remarks	
Consultant	FORCE Instituttet

Enterprise	**25. SKY-LIGHT A/S** Manufactures plastic film for the packaging industry
Start phase	Starting point in the environmental management system of the enterprise
Product chain	SKY-LIGHT has formalised an environmental dialogue with customers and plastic recycling enterprises.
Environmental cooperation	Barriers: • It is difficult to export packaging to the German market due to Green Dot registration • Incomplete harmonisation of legislation in EU countries hampers practical cooperation among enterprises in different EU countries • Danish environmental regulation is complicated and untransparent to enterprises • Difference in municipal regulations on waste management
Environmental achievements	
Perspectives	To a large extent, further work takes its starting point in customer satisfaction surveys.
Remarks	
Consultant	FORCE Instituttet