



How central authorities can support ecodesign

Company perspectives

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Preface

As environmental concern from products has become increasingly important for consumers, businesses, and NGO's, as well as for public policy makers, interest for ecodesign as a supporting vehicle and instrument has grown among both authorities and companies. From central authorities in the Nordic countries, many initiatives have been taken the latest decade to support and increase the practice and use of ecodesign, in some cases with great success. However, much more can be done in order to strengthen the practise and use of ecodesign among enterprices. Therefore, it is important for authorities to find out more effective way to support ecodesign –hereby encouraging manufacturers to design products with their environmental impact during the whole life cycle of the products in mind..

This report takes a company perspective. The ambition has been to identify the incentives but also barriers companies have for implementing ecodesign practices in their product development. Ultimately, the report can answer the question how central authorities can use these incentives to further support ecodesign. NB. Ecodesign is understood as the process of integrating environmental aspects into product design and development.

The project has been initiated and financed by the Nordic Council of Ministers. This research is the result of a close collaboration between Mr. Hans Eric Melin, Ivy Communications, having a background in PR and environment, and Ms. Anna Karin Jönbrink, with a background in ecodesign at Swerea IVF.

Special thanks from the research group to all the persons and companies who generously gave of their time for our interviews. Thanks also to the experts who gave us part of their experience connected to this issue. Last, but not least, we want to thank Mr Bengt Davidsson, Ms. Ylva Reinhart, and the Products and Environment Group of the Nordic Council of Ministers, for providing fruitful feedback and comments on our research.

The authors have the sole responsibility for the content of the report and as such it can not be taken as the view of the Nordic Council of Ministers.

Summary

Over the years, ecodesign – that is the process of integrating environmental aspects into product development and design using a life-cycle perspective– has gained a lot of interest from both companies and authorities. From a company’s point of view, the interest comes from the hope to gain competitive advantages. Public policy makers and authorities foremost see the potential for decreasing environmental and health impact from products and contribution to sustainable consumption.

The purpose of this study is to give suggestions foremost to central authorities on what can be done by them in order to further support and strengthen the practise and use of ecodesign among enterprises.

Although there are several success stories of ecodesign, it’s fair to say that ecodesign not yet has reached a general acceptance among enterprises. By using companies own experiences, this study identifies *incentives and barriers* for ecodesign as well as company structures on *what really drives* companies to use ecodesign.

The findings indicate that the *concept of ecodesign is not as strong as its content*. Companies with leading positions in a wide range of industries work actively to lower their environmental impact, but the main incentive is only occasionally aimed at environmental issues. Instead they aim at decreasing other product features such as its weight and energy use, as well as other product changes wanted by the customers. In fact, a main finding in this study is that there are from a company perspective no actual incentives for the concept of ecodesign. However, instead, there are incentives for product development and design, either because there are problems to be solved or opportunities to be exploited.

The study showed clearly that the main incentives for developing new products is *increased sales*, as well as maintained or increased *market share*. Product development is rarely aimed at decreasing the companies’ own costs. This is supported in literature stating that companies that use a ‘focus strategy’ (concentrate on a specific segment) or a ‘differentiation strategy’ (making their products unique) should pay less attention to low price and more focus on adding new features that can motivate a premium to and around the product. This implies that if ecodesign should be used in these companies, the result of it should be to *add value* to their products.

What’s interesting is that most companies in the study said they *could do more for the environment* but saw little incentive to do so. Regulations and laws often aim too low. Thus, all market players will offer the same environmental benefits and giving customers no added incentive to buy better products. Even if not all companies are explicitly asking for

tougher legislation, it is likely that more ambitious companies would benefit, while others would be forced to improve.

This is also especially true in *public procurement*, a sequence many companies find *everything but "green"*, and there should be *better enforcement of environmental policy* as well as *use of environmental criteria*. As long as public organizations do not buy best possible products for the environment, *a big market is wasted* from a societal point of view. And as long as *price* is more important than the environment, this is also a message to all companies about what really counts.

A main barrier to ecodesign for companies is to overcome *product development costs*. Even if companies do not consider general ecodesign features as vital to their customers, developers and marketers see a potential in selling their products with new values or even to new customers. However, this means high *risk* and takes financial as well as personal resources from activities that otherwise would be used to keep pace with their competitors.

The interviewees were more *positive towards legislation* and regulation than expected. It was obvious that companies providing environmentally good products see stricter legislation as a positive thing, making their competitors work even more to fulfil them. For some issues, such as *chemical substances* where it is possible that the customers do not have enough knowledge to make demands, legislation is *seen as the only way* to improve the products.

Companies not already providing environmentally good products see legislation as the only reason to improve their products, asking "why should we use money and effort to create something which is not asked for by anyone?" They think that if a law tells them what to do, it is the same for their competitors. But if they do it unilaterally, they only see a cost that the competitors don't have. The recommendations are therefore to *let best practice guide legislation*. Weak legislation gives legitimacy to lagging companies, while it doesn't encourage good companies to do better. Doing this, it is also important for authorities to have *contacts with individual companies* rather than industry associations, as the latter normally represent the middle or lower range, rather than the top.

To increase the possibilities for developing ecodesign even without an obvious or in an unpredictable market, *support for research, development and marketing* can be success factors. However, for this to be effective the *support should be flexible and long-term*. Instead of stating in detail what companies should develop from an authority perspective, definitions should be broader. The demands should include the likelihood of whether the company will succeed, not only with the development, but also with commercialization of the product. A key feature here is also to enable companies to use ecodesign principles within their current product strategy.

Finally, there is a *need for more easy-to-use tools for ecodesign* and its different processes. This is not considered as a main barrier, but every-

thing that can make knowledge more accessible and the work smoother will be positive for the development of ecodesign.

1. Introduction

Ecodesign¹ – or design for the environment – is an integrated approach to product development with the aim of developing products with as small an environment footprint as possible. When doing ecodesign the whole lifecycle of the product is considered in the design phase, ranging from raw material and manufacturing to distribution, usage and disposal.

Over the years, ecodesign has become more established and though one can't say that everybody or every company is familiar with it, it stands for something companies find increasingly important. Still, the ecodesign concept and processes aren't much in use, or at least not as much as its proponents would like it to be. One important reason for this may be that a company's incentive to implement ecodesign have frequently been taken for granted. Moral incentives, such as “we should all contribute”, have been used in combination with social incentives, such as “it's good for the company brand”. These are incentives that normally are rather weak when used in such contexts as when prioritising human resources used for different purposes or legitimizing ethical considerations. The question is why ecodesign would be different to these?

Therefore, authorities that want to increase the use of ecodesign among enterprises – in order for them to reduce the environmental impact from products thus contribution to sustainable production and consumption – need to define why companies should adopt ecodesign in their product development. What drives them to do so? If we have a better knowledge about the incentives, as well as the barriers, and about how to work successfully with ecodesign, initiatives from the authorities may have a significantly larger impact.

1.1 A company perspective

During our study we visited a large company on the Swedish countryside. A couple of minutes before our appointment we entered the reception after climbing the stone-covered stairs. A small handicap elevator was installed on the side of the stairs. We saw it as an attempt to prioritize easy wheelchair access to the office and while we were sitting there it was indeed used by an elderly gentleman sitting in a wheelchair and accompanied by someone we believed was his nurse. This was highly un-

¹ ISO 14062 explanation: Ecodesign is the process of integrating environmental aspects into product design and development.

usual in our eyes as older people are rarely seen in corporate headquarters, specially not if they are disabled.

During our interview we were sitting in something that could be the boardroom. One of the walls was made of glass and lighting up the room while the other walls had a presentation board and a painting. At one point as we were talking about owner influence we asked if their owners take part in the operations; do they feel their presence? The respondents both smiled a little. One of them said: “Well, yes we do. You have our founder behind you.”

We looked over our shoulders and through the glass wall. There was the elderly gentleman in wheelchair chatting with people he met on his way. We turned our heads and looked at the painting again. It was of the same man, named Jarl Andersson and chairman of the board from 1942 to 1995. Obviously Mr Andersson, the founder of Kinnarps, Europe’s third largest office furniture manufacturer had retired. But so far he hadn’t left the building.

We think this story is worth keeping in mind. A company is the product of its history. This includes the founder, the people working there and on their relationships. It is affected by its activities it has been up to during its lifetime. Sometimes the initial business concept has faded away, either because of conscious strategic moves or because the business environment has forced changes to happen. But often, not least in successful companies with steady growth, the expertise, the ideas and the capabilities are tied up in a corporate culture stating what’s right and wrong.

It’s here we want to look for incentives for change – here at the very heart of the organization. Companies are not theatres that suddenly can change play and ensemble. They are dependent on its staff, its customers and suppliers. When we ask a company to change, we ask it to put its culture on the line. Not many companies do that voluntarily if they don’t have to.

The hypothesis of this study is that to change the way companies design their products one has to use the incentives that have taken the company to what it is today.

1.2 The role of authorities

The authorities can have an impact on the development of industry, products and society in many ways, including by legislation, transfer of expertise, financial aid and other incentives, and the influence of public opinion and people’s general knowledge.

When it comes to ecodesign support, authorities in the Nordic countries has so far firstly supported the dissemination through seminars and other educational measures, direct financial support to companies, indirect financial aid e.g. by using consultancy checks, supporting an eco-

labelling scheme, the Swan, and by funding research, such as NUTEKs program for environmentally adapted product development (MPU). Secondly, the authorities have supported networks of companies, organisations and people.

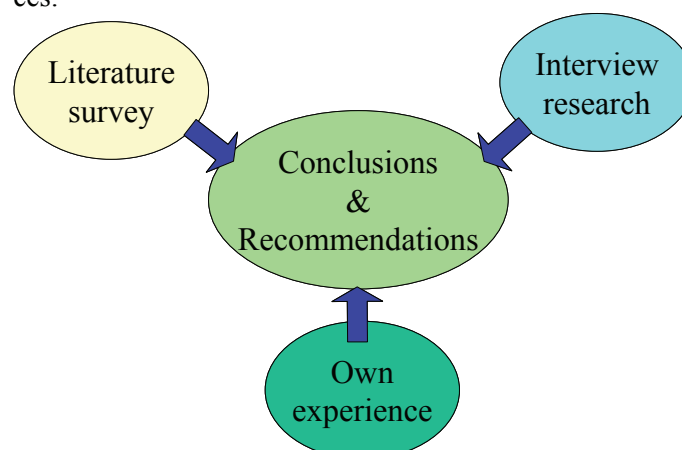
Several of these actions seem to have been very successful. But, ecodesign is still not really the rule, but the exception. To some extent this can be explained by time. It takes time to change opinion in the companies and it takes time to develop new procedures and methodologies. However, it could also mean that even if the programs are effective *per se*, they may not be effective on a larger scale.

That's why this study is taking the company perspective. We want to understand where the goals of society, thus the authorities, intersect with the goals of the companies. That's where we believe things will happen faster. To do this we have had four interconnected tasks:

- To find and describe company incentives and barriers.
- To find and describe ecodesign tools and methodologies that suits the incentives and barriers.
- To find and describe what authorities already have done in terms of policies, framework and other initiatives.
- To give suggestions on what can be done by mainly central authorities in order to further support the incentives and minimise the barriers.

1.3 Methodology

In the study we have used three different, though equally important sources.



1.3.1 Survey of available knowledge (literature)

A study of current literature was made in order to collect knowledge about what is already done in this field, but also to build a model for

identifying incentives and barriers, as well as tools and methodologies for ecodesign. The study covered different disciplines such as innovation management, marketing, communication and product development and design management. The purpose was to establish an integrated model, one that covered all possible product development areas relevant to ecodesign issues.

1.3.2 Interviews seeking new knowledge

Interviews were made with 16 companies mostly in Sweden but also in Norway and Finland. The approach was to go behind the usual statements and letting the company representatives tell the researcher how they are working with product development today, what demands previously have sparked the development, what they think has worked and what hasn't.

Experts in ecodesign in the Nordic countries were also interviewed, as well as some experts in other countries such as the UK and Germany. These interviews have been used as references regarding the conclusions and recommendations, as well as to test International feasibility.

1.3.3 Use of our own experience

In our roles as researchers and consultants we have previously been involved in several projects that have supported ecodesign and processes alike. This experience has been very important during the whole research process, especially as we have different backgrounds and have covered the field from different perspectives. The perspectives used are the PR or marketing perspective of environmental issues, and the ecodesign or technical perspective of environmental issues, both tight connected to products and product development.

2. Literature Survey on Ecodesign

In order to build a thorough base we have studied the literature on ecodesign and its methods together with literature from other disciplines, such as innovation management, marketing and communication. Our goal has been to find viewpoints that can help us go beyond instant answers from specific companies to finding support for questions that will move us closer the real answer of why companies in fact use ecodesign. In order to find even more relevant literature, and discuss available knowledge, some experts were also contacted and interviewed².

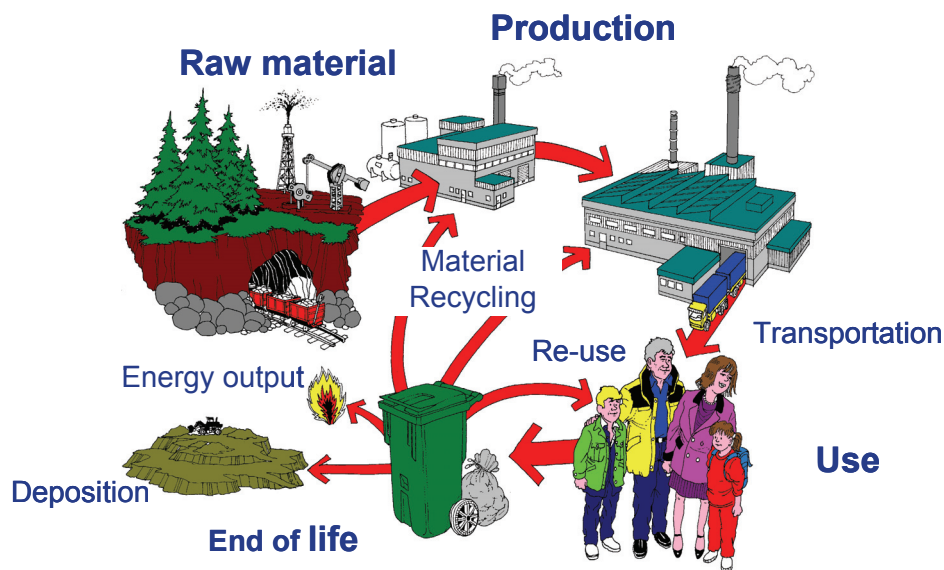
2.1 The concept of ecodesign

Much of the environmental impact in our communities comes from the products we buy, use and throw away. The impact and performance of these products are mainly decided when they are developed. The best way to minimise the environmental impact is to develop products with smaller environmental footprints, a methodology often called ecodesign. According to Ryding et al³ ecodesign is product development whose objective is to create a minimum of environmental impact per functional unit. Due to its great potential to improve the environmental performance of products, ecodesign is an issue of increasing importance for both society and industry.

One very important thing with ecodesign is to have the full life cycle in mind when optimising the products, thereby looking at the environmental impact “from cradle to grave”, including thus raw materials, production processes, transportation, use and disposal. In the definition of ecodesign we include product development from a technical point of view, but also the product expression.

-
- ² Anne Marie Tillman, Professor of Energy and Environment, Chalmers University of Technology
 - Leif Thuresson, Head of Environmental Technology and Management, Linköping University
 - Carl Dalhammar, PhD, IIIIEE, Lund
 - Lars Siljebratt, EQ Integration, Lund
 - Olof Hjelm, Associate Professor of Environmental Technology and Management, Linköping University
 - Marcus Wendin, O2 nordic (responsible for the ecodesign pre-study)

³ Ryding 1995



There are several different tools available for ecodesign, such as Life Cycle Assessment (LCA)⁴ and other tools to get good information about the environmental impact of a product during its lifecycle. Some tools, such as the Eco Strategy Wheel, are developed in order to enhance new ideas for environmentally better products. Different tools are suitable for different situations, affected by such aspects as the background of the user of the tool, the size of the company, and the complexity of the product⁵.

2.2 Why do companies conduct ecodesign?

From a societal point of view ecodesign makes perfect sense. Ecodesigned products either cause fewer environmental problems, such as use of chemicals, non-recyclable material and high consumption of energy, or it influence people to use them in a much more environmentally friendly way. Even though there may be questions raised about how much more eco-adapted these products are, not much criticism exists about ecodesign as a way to decrease the environmental impact of products.

From a company point of view it's much trickier. It is not certain there is a perfect match between what a public good is and what is perceived as being good for the company. Rather, over the years, these two perspectives have caused several collisions as in the cases of use of lead, mercury, certain chemicals and emission levels of others. Although research in fact tells us that regulations and legislation have often fostered innovation and even brought higher productivity resulting in higher profits, it is

⁴ ISO 14040

⁵ Jönbrink et al, LCA software survey, IVF 00824

also possible to claim that environmental concerns limit economic growth⁶.

However, in the case of ecodesign, a popular idea not least promoted from authorities and NGOs is that societies and companies both benefit from the process.

“By applying ecodesign in product development companies gain competitive advantages.”

2.2.1 Ecodesign in companies

In Sweden the most thorough studies of ecodesign are the final reports from government-supported programs, mainly from the national business agency NUTEK. Among companies that participated in the program “Environment-driven Business Development”⁷ 55 per cent said the participation has or will lead to an improved competitiveness. In the popular presentation that followed the same program, “Successful and profitable – how environmental work can benefit your company”, the results sounds even more positive. Some 15 companies and their results from their respective projects are featured. The presentation concludes:

“Environmental improvement is not an expense item but an investment. Well thought-through environmental work can lead to great competitive advantages for both small and larger businesses. ”

Going through the cases with a critical eye gives another possible conclusion. The values coming from the projects have normally not so much to do with increased competitiveness, as with improvements in operations. Examples of these improvements are a clearer view of the manufacturing process, direct support in product development, advantages in public procurement, or a reason why the company went through a certification process.

In another NUTEK study “Effective use of Environmental Management Systems”⁸, the results are not that straightforward, even though the authors conclude that the uses of environmental management systems often correlate with lower costs and more effective management:

“The business potential is not primarily related to an increased order stock due to the environmental management system, but rather a result of the management system being a tool for increased efficiency and reduced resource use, which in turn leads to lowering costs.”

Even though the sources are few a conclusion that can be made is that use of ecodesign normally has some positive impact on the company. However it’s not necessarily as strategically important as some reports may state. This motivates a narrower look at one specific question that

⁶ Porter, Van der Linde, 1995

⁷ NUTEK Report 2005:11

⁸ NUTEK Report 2004:5

too often is overlooked: why do companies invest in product development?

2.2.2 Corporate strategy for product development

Staying ahead of its competitors is essential for the survival of a company. Even though competitors always will exist, it's always important for a company to operate more efficiently and to address the needs of its market better. Otherwise margins will erode, leaving less money to invest and finally raising the capital costs. One of the most cited and commonly used theories about how a company should do this is Michael Porter's three generic strategies:⁹

- Cost leadership
- Product differentiation
- Focus on a specific segment

Traditionally, these strategies may change over time, depending on in what stage the product is. In the early days of an innovation, product differentiation and thus product innovation, is a common and often profitable strategy. When products start looking the same, corporate factors become more important, including cost control, raw material availability or speed of manufacturing. Eventually, when a product becomes more and more commoditized, focus on a specific segment may be the winning formula.

The role of product development differs greatly between the stages. In the early stages of a product, specific features are important. Margins are normally high and they are protected by the fact that different customers have chosen different solutions. Also, in an existing market boom, demand is higher than the supply, fuelling high margins. Once the product becomes more widely used incremental improvements are important together with innovations in the manufacturing process, business model or in the supply chain¹⁰.

In all, these three strategies form a generic industry development where eventually large investments are made to sustain small differences between a handful of companies. This is when an industry is sensitive to what is known as "disruptive innovations"¹¹. Innovations that attack customers' needs from a completely new angle may succeed, often by offering similar products to customers that previously never have been able to afford the products. Profiting from this often untouched market, these innovations then manage to climb the value chain until they eventually manage to outperform the incumbents that previously appeared as un-

⁹ Porter, 2000

¹⁰ Utterback, 1994

¹¹ Christensen, 1997 and Christensen/Raynor, 2003

stoppable. Famous disruptive innovations include the personal computer (disrupting the mainframe computer), the mini steel mill (disrupting the integrated steel plant), and web-based software (disrupting client-server based software).

Another strategy with several similarities to disruptive innovations is the Blue Ocean Strategy¹². This implies that products offered on highly competitive markets (red oceans) could be used in completely new markets where there are no competitors and where quality demands are not as high as in the traditional markets. This enables companies to lower costs that do not add value to the new market needs. A great example is the Australian wine Yellow Tale that turned to traditional beer drinkers. Instead of the endless refinements that are made in the wine industry to give their wine that little extra, Casella Wines, the owner of Yellow Tale, concentrated on making their wine easy to drink and accessible in outlets that sell beer, not wine. Costs are down and the market share is up.

As ecodesign often goes hand in hand with cost reductions and new values that can attract new customers, these two strategic perspectives, disruptive innovations and the Blue Ocean strategy can be useful when understanding why some products with better environmental performance could succeed.

- To summarize, there are four strategic reasons to invest in product development:
- To make a product unique from other products (product differentiation).
- To make a product as cheap as possible to manufacture and bring to market (cost leadership).
- To make a product as attractive as possible to a specific target group with specific needs (focus).
- To make a product that fulfils target group needs that never have been addressed before or that go beyond currently available products (disruptive innovation and Blue Ocean Strategy).

2.2.3 Organization factors affecting product development

Even if the generic strategies demonstrate logical reasons to innovate, companies quite often fail to follow these strategies. In fact they often fail to follow any specific strategy at all. Researchers such as Henry Mintzberg and Andrew Pettigrew¹³ have shown that operations in a firm often are the product of reasoning and bargaining between staff members. The goal may be stated as profit-maximization. But the real goal for managers is balance, which is obtained by intrapolitical compromise.

¹² Kim/Maugorgne, 2006

¹³ Whittington, 1993

One important path to obtaining balance is a well-managed work force. Staff-members who find meaning in their work situation and believe in the company mission normally perform better than those who don't¹⁴. An increasingly shared interest in environmental issues they may have a positive impact on the decisions involving these issues in the company. This means that even if there is no real strategic value in a particular ecodesign, it may pay back its development in other currencies such as a proud work force, positive image with authorities and customers and their employees.

However it is not only power measures that affect how the organization may take on new methods. Another important factor is the ability among staff members to understand and interpret what facts mean in varied contexts. According to Emma Rex¹⁵ different people in a company often perceive the customer voice very differently. Put another way, the same sentence and wording from customers have totally different impact on different people. While product developers perceive customers as economic and rational human beings, corporate communications may regard the customers as environmentally concerned and interested. Market communications people looked for personal values among customers, such as prestige, personal profit and confidence. These findings contribute valuable explanations why ecodesign projects sometimes don't get the support they are worth.

2.2.4 Legal and commercial incentives for product development

Other non-market incentives that may drive product development are new legislation and commercial initiatives.

As the legislation could be considered as no-brainers in that they must be followed, other "soft" initiatives affect companies very differently. There are several examples of these initiatives in the environmental area that affect development.

One thing forcing companies into ecodesign might be the Environmental Management Systems (EMS) such as ISO 14062¹⁶. In a study called "Environmental management systems - paper tiger or powerful tool"¹⁷ that collected experiences from some 200 companies about their EMS, one of the main findings was that "concerning the environmental efficiency of EMS the most important observations are: From an environmental and economic point of view it is desirable that there should be more focus on the use and disposal phase of manufactured products. One-third of the companies had a life cycle assessment (LCA) carried out on some product."

¹⁴ Grönstedt, 2000

¹⁵ Rex (2007),

¹⁶ ISO 14062 Environmental management – integrating environmental aspects into product design and development

¹⁷ Zackrisson et al 2000

Environmental product declarations (EPD) are often mentioned as an incentive to ecodesign. In a study called Stepwise EPD¹⁸ where ten case studies in small and medium-sized companies in three European countries were made, the main finding was that for companies providing EPD, it is often used mainly for internal purposes. The first idea usually is to give better information about the environmental performance of the product to the customers. Findings are that customers are not as interested in these as first thought. Still the companies use the knowledge about environmental performance gained, such as which life cycle phase or which component is most important for the environmental performance, to develop products with better environmental performance. It is often done without customer demand.

2.2.5 Reaching a preliminary conclusion

The literature shows several potential factors that may drive product development in a company, ranging from purely strategic reasons to more complex ones. However, in several findings it is stated that if ecodesign should be considered as a strategic tool that creates real competitive advantages capable of being presented in a slide show in front of the Board, it has to address the previously mentioned market-centred strategies. This is important, not least because this is the most likely way for a project to receive funding.

The strategic approach supports ecodesign in several cases. What's important is that the use of ecodesign should not depart from the overall business strategy. If a company is gaining its competitive advantage by keeping its costs down, its ecodesign activities should do the same thing. If the competitive advantage is a unique product with unique features (product differentiation), the ecodesign should support this strategy.¹⁹

In the case of cost leadership there are plenty of situations when ecodesign correlates positively with the overall operations. Using less raw materials, more effective transports or lighter weight support both a better environment and a more cost effective product. Thus this strategy will support all actions that will lower the cost base, be they environmental or of some other nature.

In a product differentiation strategy the company tries to charge a premium for its unique products. Here ecodesign products can be very well positioned, especially today when public awareness of environmental issues in general and of global warming in particular is high. This strategy can also be called eco-branding. To succeed in differentiating its products through its environmental qualities, three requirements must be satisfied²⁰:

¹⁸ Zackrisson et al 2007

¹⁹ Orsato, 2006

²⁰ Reinhardt, 1996

- The business must find or create a willingness among customers to pay a premium for the environmental values. This could be low maintenances costs, freedom from future legislations, or a true value for the customer to be eco-adapted.
- The business must establish credible information about its products' environmental attributes. That is, they have to market it.
- The product, or innovation embedded in the product, must be defensible against imitation from competitors.

The most popular and perhaps greatest example of environmental product differentiation is the Toyota Prius²¹. By giving the car a bold and unique design (Prius exists only in a hybrid-electric version) customers can make a statement when driving it. Even though many customers say that fuel economy is the main reason why they buy the car, the average expectation for pay-back (considering the vast purchase premium) among the same customers is more than 6 years, while some 15 per cent don't know. This shows clearly that they have bought the car for other reasons, but that they are aware of the positive impact on the environment. The technology behind is patented and even licensed to other car manufacturers, but under the control of Toyota.

Using a focus strategy is also an option for ecodesign products. However, the problem is that it will be limited to environmentally focused customers or customers who seriously need to improve their environmental performance, such as because their customers are demanding it. On the other hand, this market is growing.

In the literature there are examples of companies that have succeeded in using multiple strategies. In the 1990s, the document company Xerox successfully took over responsibility for disposing old equipment they previously had sold. The incentive for Xerox was to use the old machines and upgrade them with new technology. By doing this Xerox saved in the first year alone some \$50 millions in reduced raw material costs and in the coming years several \$100 millions. But when they launched the program they in fact changed their whole business model, taking care of everything from delivery to disposal, which became an important competitive advantage, differentiating Xerox from its competitors.

The main conclusion given in the literature is that ecodesign decisions ought to follow the company strategy. When it's not clear what the company strategy is, a not too unusual situation, one should study what the company does to find the answer. However, research tells us there are only a few companies that will take the initiative of using new technology to do something new and innovative. The rest follow the leaders, often with poor profitability as a result. These companies are probably not the right companies to study. They will eventually do what the leaders or growth mavericks are doing or they will fail.

²¹ Marcus, 2004

2.3 What has been done by authorities to support ecodesign?

Authorities can have an impact on the development of industry, products and society in many ways. Regarding environmental issues and ecodesign, central authorities (in Sweden – the Swedish Energy Agency, the Swedish Environmental Protection Agency, NUTEK and others) have supported sustainable development through legislation, with seminars and other educational measures, with support to companies, such as the “Program for Energy Efficiency”, and with support to research, such as NUTEKs “program for ecodesign”. There has also been a possibility for direct corporate support from institutes and others through consultancy checks for ecodesign in, for example, “Advantage Östergötland” and other initiatives. In Finland there has also been a support to companies to develop new smart products. Other measures have been to support networks of companies, organisations and individuals.

The next chapter present examples of environmental approaches and instruments being introduced by central authorities.

2.3.1 Legislation, directives and strategies

Legislation regarding products and their environmental impact is increasing.

In 2005 the European Commission issued frame directive 2005/32/EC Establishing a framework for the setting of ecodesign requirements for energy-using products and amending Council directive 92/57/EC and 2000/55/EC of the European Parliament and of the Council. The main scope of this directive is that energy-using products (EuP) shall be developed with ecodesign in mind. Implementation measures for many products will follow this frame directive. That process is right now ongoing and no implementation measures are yet decided. The directive is a harmonised directive, i.e. the same legislation in all EU countries, but the fulfilment of it will be up to the different authorities in the EU countries. The frame directive does not seem to have any major impact on the European companies as yet, except that they have to be alert for possible upcoming implementation measures, whereas those measures for different product groups probably will have a major effect on the development of these products. Still the implementation measures will probably be on a detailed product level, such as limits for stand-by and off, and will thus not force the single companies to opt for ecodesign in a wider meaning. They need only follow the legislative limits, which according to the preparatory studies will naturally have a large influence on the environmental impact from the products within Europe.

Labelling directives, such as the one regarding household equipment energy efficiency (A-G), have forced the industry to improve the envi-

ronmental performance, since the consumers understood the message and want to buy good equipment.

According to Shinn et al [2007]²² the WEEE Directive and other producer responsibility initiatives, will only impact on the end of life treatment of products, not as the first intention was to support ecodesign. IPP, Integrated Product Policy, is another EU-policy of interest. Many initiatives are taken in this context with an impact on ecodesign in the Nordic region. Still it is only a product policy and lacks major impact on the companies by itself. The initiatives started by the IPP though, are often more specific, and thereby have a larger impact on the companies. Chemical regulations forbidding some chemicals in certain products, such as the RoHS Directive, have an impact on the design of the specific products covered by the directive, but also on other products. According to Andersson et al²³ one example is that most electronic manufacturers now go for lead-free electronics, even if the directive does not cover the products. Since the lead-free and the lead soldering are not compatible, the component companies have to make a choice. The lead solder is forbidden for most products, and therefore the components for lead become a decreasing niche and the lead-free components the major volumes.

2.3.2 Research support (including development of ecodesign tools)

There has been quite some support for research regarding ecodesign the last years. One example is the programme “Design for the Environment in SMEs” financed by Nutek. The objective of the programme was to “benefit design for the environment in small and medium sized enterprises, in order to strengthen the development potential of Swedish commerce, and contribute to the change to a sustainable society”. It was not always easy to find companies to involve in the different projects within the programme, due to lack of time, difficulties in seeing a link to immediate economic benefits, and also that ecodesign was not very clearly described as an important part of the environmental management systems, such as ISO 14001, but also more sector specific systems.

Some main findings from that programme are that the companies find a great benefit in the learning of ecodesign and consider the contacts they made through the programme very important. The tools developed in the programme were considered easy to use, while one problem remained in the fact that the simpler the tool, the more knowledge the performer needed. Many companies divided ecodesign results in two parts: economically valuable factors, such as energy savings, and morally valuable, such as factors “only” positive for the environment. After finalising the projects, many companies did not consider the economically valuable im-

²² Shinn et al Forcing products to go green 2007

²³ Dag R. Andersson, Jeremy Pearce, and Andy Longford, *Future lead free soldering technology - what lies ahead?* 2006.

improvements as ecodesign results, while simultaneously considering those improvements having no obvious economic advantage, as environmental improvements. The companies in the programme thought that the demands from authorities and customers were weak, but thought that these will become stronger in the future and that the projects gave good help in preparing for the future.

According to Baumann et al²⁴, who performed a large literature survey of green product development, there are many tools for green product development available on the market for the task at hand. The problem they found is that the tools are not used enough. They argue that, in order to make an environmental optimisation of resource use and a minimisation of emissions, a systems perspective is necessary, both in research and practice.

In the project “Energieeffektivitet i produktkedjan” (*Energy efficiency in the product chain*)²⁵ one finding regarding the project and the outcome for the companies involved, was that the companies consider the research organisation and the project itself as an important forces in the development of energy efficient products. Product development departments are often very busy, frequently with short-term problem solving, and they can have difficulties in focusing on long-term development. Having an external person come in to the development process and pushing long-term projects was considered very positive from the companies involved.

2.3.3 Eco-labelling, claims and environmental product declarations

One thing that is developed to support ecodesign is eco-labelling. There are many different voluntary (and some mandatory) environmental performance labels and declarations. According to a study made by the Nordic Council of Ministers 2008²⁶, there are three main ways for authorities to support eco-labelling: financial support, public endorsement and integration into existing and new products, as well as consumer and environmental policies, such as through public procurement. The study also discusses harmonization between different labelling schemes, such as the Swan and the EU Flower, but there is not yet a shared agreement about if and how to do that, even among the Nordic countries. The International Organization for Standardization (ISO) has identified three broad types of voluntary labels:

- Type I²⁷ is a voluntary, multiple-criteria based, third party program that awards a license authorizing the use of environmental labels on

²⁴ Baumann et al Mapping the green product development field: engineering, policy and business perspectives [2002]

²⁵ Jönbrink et al 2005

²⁶ Nordic Council of Ministers 2008; The Nordic Swan

²⁷ ISO 14024 Eco labelling (Type I)

products indicating overall environmental preferability of a product within a particular product category based on life cycle considerations.

- Type II²⁸ offers informative environmental self-declaration claims.
- Type III²⁹ is a voluntary environmental declaration providing “quantified environmental data for a products with pre-set categories of parameters based on the ISO 14040 series of standards, but not excluding additional environmental information”.

For more on Type I, II and III see appendix 1.

2.3.4 Public procurement

In Sweden and in other Nordic countries there are initiatives to use public procurement as a tool for sustainable development. The Swedish Environmental Management Council (MSR, Miljöstyrningsrådet) has developed a practical tool called the Guidance for Sustainable Procurement³⁰ (formerly called the EKV-tool), where not only the public purchasers but also everyone interested, can find information about good purchasing criteria to use in order to buy only products that are considered having a smaller environmental footprint.

On European level, there are similar initiatives, such as the Energy Star Programme, where companies can list products with lower energy impact, providing they fulfil the criteria set by the Energy Star programme. The Energy Star Programme was developed by the US EPA (Environmental Protection Agency) and for some years now also in collaboration with the European Union. The US EPA also has a tool called Environmentally Preferable Purchasing (EPP).

Both the MSR-guidance for sustainable procurement and the Energy Star criteria’s are considered strong incentives for the industry. Still, they only cover some main product groups and there are many other products on the market. The Energy Star criteria also only deal with energy efficiency, to the exclusion of other environmental impacts.

2.3.5 Support to SMEs (small company service or consultant chits)

A regional program called Advantage Östergötland (Fördel Östergötland)³¹ was implemented in Östergötland, Sweden in the early 2000s. There was some ecodesign education for the companies in the project, after which the companies could use some “consultancy checks” within a network of consultants for ecodesign purposes. Two main ecodesign purposes were seen, one to implement ecodesign on “ordinary products” and

²⁸ ISO 14021 Self declaration (Type II)

²⁹ ISO 14025 Environment Product Declaration, EPD (Type III)

³⁰ MSR – guidance for sustainable procurement, www.msrf.se

³¹ Advantage Östergötland (Fördel Östergötland) [Hjelm et al]

the other to support the development of eco-products, such as heating pumps and products for production of ecological food.

The main findings from the project were that different situations in the companies have different needs. When providing the companies with a network of experts with different skills, it was possible to give every company something of value and the outcome of the project was satisfied companies saying they have better products and a better position at the market.

3. Interview Results

The purpose with this report is to find out how authorities can persuade or even force companies to adopt ecodesign processes. Finding out what actually drives ecodesign in the companies is essential to this question. Given the information from the literature study this may be a lot of factors, not only pure environmental ones. This is why another key question here is: what motivates a company's product development? And what is the real reason a company designs products that benefit the environment or cause less harm than previously?

3.1 Collected material

3.1.1 Sample of companies

To answer these questions in the introduction above, we have interviewed 16 different companies³² ranging from mid-sized companies to big multinational corporations. There are privately held companies, both by family or part of a conglomerate or holding company, as well as listed companies and subsidiaries of large industrial groups.

The one thing all of them had in common was an active and structured product development process. This was our main criterion when choosing companies to interview. It does in fact make the sample biased, as companies with a structured product development seem to have higher ambitions than companies that only make *ad hoc* improvements in their products. This is supported by the fact that all companies interviewed are profitable and in most cases either are the leader or among the leaders in their specific segment, often on a European or even global basis.

This means that the sample of companies is not necessarily representative for all manufacturing companies in the Nordic region. However, with limited resources we found it most interesting talking to market leading companies, as the decisions these companies take eventually will affect their industries as a whole.

Most of the companies interviewed sell their products to other companies – they are business-to-business focused. There are two reasons for this. First, the business-to-business sector in the Nordic region is much bigger than the consumer sector. Second, conventional incentives among buyers, such as personal preferences based on factors like lifestyle variables, are not as clear in business-to-business as they are in business-to-

³² List of companies interviewed, see appendix 2.

consumer. Thus the challenge to make companies adapt design voluntarily is much tougher especially when it only improves environmental standards.

Industries represented include: heavy trucks, appliances, textile products, vehicle racking systems, payment solutions, waste water solutions, clock manufacturing, chemicals, lightning, office furniture, and water mixers - a wide spectrum of products with very different environmental footprints.

3.1.2 People interviewed

In almost all of the companies, except for the largest corporations, we interviewed the head of product development. In some companies we spoke with the head of purchasing, product planning and/or product managers.

In some of the companies, several persons at different positions were interviewed in order to get a broader view of the issues. Persons interviewed ranged from the CEO or other top executives, head of product development, head of marketing and sales, to people responsible for quality and environment.

3.2 Why companies do product development

Basically all companies in the study systematically develop products for one single reason – to increase sales – either by increasing or defending its market share or by increasing the gross margin by adding new features or raising product quality. The smaller companies that in some cases don't even have a market yet, are doing it to fulfil the needs of their potential markets, often without knowing what they are.

In mature markets, increased sales are frequently similar to sustained sales. One company representative even described its product development as the essential backbone of the company and a key to long-term survival:

“We see product development as an insurance. We keep a high pace in good times as well as bad, not least to stay fit in a recession.”

There were, however, other reasons for improvements and changes in products. Legislation is one obvious incentive by forcing a company to adapt to new conditions, finding new components or even changing the core of the design. However, in many cases, not least when it concerned environmental issues, the companies we interviewed claimed legislation wasn't that important as they already had switched to new standards or better components ahead of both competitor decisions and legislative demands.

Another reason was cost reduction, which often aimed at increasing the gross margin by using less expensive material or making it easier to manufacture, thus keeping pace with its competitors. A few companies said this was very important, especially when competitors used aggressive pricing in order to gain market shares. That increased sales and gross margin drives development is perhaps not unexpected. However, we were surprised at the dominance this reason had.

From a research point of view, one possible explanation for this may be found in the sample of companies. Almost all companies interviewed offered either premium products or complex products where added services, guarantee agreements and finance solutions were used as differentiators rather than low price, provided that no competitor offered a significantly lower price. Perhaps this is why most of the companies interviewed are leaders in their respective market segment – they develop their own products to increase sales, while they let their suppliers do the cost cutting. According to the literature survey, in an effective market the price will eventually always be “right”. In such a situation it’s better to use product development to avoid market levelling – that is, to develop new products and features rather than making current products cheaply.

Stated according to the findings in the literature study, most companies that were interviewed used either a focus or a product differentiation strategy. None of the interviewed companies regard cost leadership as the main strategy.

3.3 How product development is initiated

Implicitly increased sales and margins mean an increased attraction among customers. The question then is: how can a company find out what will attract its customers so much they either will pay more for the product or give up a competitor product they currently use? Alternatively, how can it attract customers who never have bought the product to do so for the first time?

In essence the companies stated four major sources for initiating product development decisions:

- Dialogue with current customers
- Market trends
- Competitor activities
- Internal initiatives

3.3.1 *Dialogue with current customers*

No company argued against the importance of good communication with its customers. As one company representative said:

“Customers are our main source of information. Some of them are very innovative and we are definitively paying attention to them.”

However, what several companies told us was that the ordinary sales channels in the companies normally were quite weak in supporting customer dialogue:

“Every year we ask our sales staff for ideas. I can’t say I’ve ever heard anything else than - give us what our competitors have, but cheaper. You don’t really get much out of those guys”.

Rather input from customers comes in situations when the company and sometimes even the product developer, has a direct relationship with them. The more customized solutions the companies offer, the more they seem to get from that situation.

Often the customer is not the user. In these situations the opinion of the user sometimes has little importance, as the incentives may even be contrary to who’s paying the bill. Examples of this are found both in the lighting market and in the tap market, where the user may be paying the bill but the landlord or even the building company pays for the equipment. This is a paradox, as the product developer’s normal target is the end-user. This means that a big part of the product development results are in fact irrelevant to the buyer.

3.3.2 *Market trends*

The perception and scanning of new trends in the market are at least as important as direct customer demands. Several companies work actively with business intelligence in order to foresee what’s next. The trends can be followed on different levels. For example, Coffee Queen has a very good knowledge not only about trends on the coffee machine market, but also about how people behave, what kind of cafés youngsters in different countries want to visit, what kind of coffee is used in different consumer groups and the like. Another example is Volvo, who tries to find out how people will live and behave in the future, with huge increases in population and the consequences of that for the transport industry. This in turn points to the kind of trucks or lorries that will be needed in the future.

By studying the big picture companies also succeed not only in finding new features for the product, but also in identifying new segments. For example, when public transportation companies stopped selling tickets inside its vehicles, a new market opened for the parking meter company Cale. Its robust, weatherproof parking meters were perfect for tickets at the bus stop. This is in fact a great example of how an established product on a mature market can generate new growth in a new context.

HÅG, the Norwegian office chair manufacturer, use an integrated approach where representatives from marketing, manufacturing, logistics

and design work together in the whole development process. Often this process starts by studying customer behaviour. One example is the fact that office workers are increasingly found in meetings using slide show presentations. This has guided efforts to develop a chair for just this purpose.

3.3.3 Competitor activities

In most companies the activities of their competitors were followed very closely. Everything from market communications to technology is evaluated thoroughly and adds important data to the decision to develop new products or product features. This was especially true for more mature the markets and products. The explanation is partly that demand in these markets is rather constant. For example, for several years the tap industry has had an annual volume of approximately 0.14 taps per person in all European countries. This means that if a company should increase its sales, it has to do that by taking customers from its competitors.

In a growing market, as in the case of green house shades, where the interviewed company Ludvig Svensson has a global market share of 60 per cent, the activities of the competitors are not affecting sales as much. This is because the company is constantly adding new geographic markets as well as new customers in current markets that previously never have been using the product. Being market leader the problem with competition rather comes from copycats. Therefore a rapid product development is important for keeping the competition down. The ideas that come from studying the competitors were very few.

3.3.4 Internal initiatives

Finally, another source of ideas to product development is found within the company. Indirectly these ideas could come from following trends or the knowledge of what has been developed by competitors. But from the developer's point of view these initiatives come from people in the company alone.

"We felt it was time to change our product design. I don't believe anybody actually told us we should. We just felt it, that was reason enough". We asked all of the companies if the owners or senior management made any specific demands for the product development. The answer was a very clear "no". Active owners are not directly involved in the product development. If they were involved, they were so on a level they could be expected to be represented:

"Supported by our new owner's the senior management evaluated our entire product portfolio and outlined a new strategy in which we decided to broaden our scope and to look for new segments".

3.3.5 Non-market initiatives

Even though market-driven factors are the most common reasons to develop, there are other reasons as well. One of the most important is new legislation. Most of the companies followed the development of legislation in their market or technology segment very closely. Several companies had been affected by the RoHS and WEEE directives and had put a lot of their development resources into fulfilling the new standards. However the EuP-directive was not mentioned by any company as having caused any development activities.

The company that really stood out in this particular perspective was Volvo where a very large part of product development is affected by new legislation, for example regarding emission levels. In contrast a company such as the vehicle racking company Modul-System was almost unaffected by legislation, except for the directive mentioned above.

An interesting, and somewhat surprising, opinion from several companies was that legislation often is too weak. Several companies were convinced they would sharpen areas such as environment or safety if only the laws forced the market to do so. But they saw little reason to do this without legislative support.

”Nobody thanks you for doing a little more than what’s needed. Neither the customers nor the authorities.”

However, this is only true if the legislation concerns something that is not perceived as a direct value for the customer. Both Volvo and Modul-System, for example, have higher security measures in their products than what they are required to by current legislation. This is because safety normally is valued high among customers and that they gain a competitive advantage by doing so.

In environmental issues HÅG was a clear exception to the rule. Without any demands from legislators they have gradually improved their environmental performance impressively over the years, using recycled material, abandoning hazardous chemicals and reducing emissions.

3.4 Ecodesign and product development

Almost all of the companies interviewed have some product that may be regarded as a result of ecodesign:

- Gustavsberg provides a tap called Nordic that helps the user minimize the use of hot water, thereby saving water and energy during use.
- Volvo builds trucks with low emissions and fuel consumption.
- Fagerhult has a light fitting with energy efficient light tubes and a sensor that measures the surround light (from outside) and person

presence and then makes the light fitting provide exactly the right amount of light at every moment, saving a lot of energy during use as compared to ordinary light fittings.

- Coffee Queen makes a coffee machine with a thermos instead of a hot plate, saving a lot of energy during use.
- Uponor lists a Swan labelled compost container.
- Tikkurila provides surface treatment products with less environmental impact than ordinary products.
- Regin makes equipment that helps housekeepers decrease energy use.
- Modulsystem provides van-racking systems with lower weight, helping reduce fuel consumption for vans using the equipment.
- Ludvig Svensson makes environmentally friendly (ökotex certified) cotton products.
- CALE Access makes sun-powered parking ticket machines.
- Nimo-verken has developed energy efficient drying cabinets.
- HÅG uses recycled materials and have switched to environmentally better materials and components.

This means there is wide experience in the field in developing environmental adapted products. Still, only three companies say they are working with ecodesign. In fact some of the people we met had never heard the expression before. How is this possible?

One explanation is that it's not primarily the environment the companies are trying to address. Instead they may try to lower the cost of usage for the customer. For example, energy costs are more important than saving the environment. Luckily enough, a rose by any other name is still a rose for Mother Nature.

There are also other benefits from some of the eco-designed products. A parking meter from CALE Access that runs on solar energy is not only energy efficient. It's also autonomous from cables and thereby less expensive to install. Coffee collected in a thermos is much better tasting than coffee that is heated on a plate. And a van rack system that weighs 20 per cent less compared to earlier not only helps the user to be more energy efficient, but also is also safer in an accident.

What is quite obvious is that most of the eco-features that the companies have developed are results not from an LCA or an ecodesign tool, but from an analysis where the specific problem is addressed on its own.

There are however exceptions to the rule. Modulsystem has used LCA to identify the weight of their rack systems as the single most important quality to improve in order to generate a smaller carbon footprint. Volvo has discovered that its customers in fact have started to care more and more about the environment, especially the threat of global warming, and thus low emissions and fuel efficiency have started to become a very

important demand. On the other hand, it's hard to say which is most important – to save the world or get more mileage.

3.5 Why ecodesign has been initiated

We have concluded that even if the companies don't use the expression ecodesign, they have performed development that is good for the environment. Then from where comes the initiative to do so?

Perhaps not so surprising, the reasons to develop these features don't differ very much from the overall development described above. In essence there are three major reasons described by the respondents in the study: customer demands, internal initiatives, and adaptation to legislation.

3.5.1 *Customer demands*

Many of the companies have received questions from their customers on specific issues, such as energy consumption and certain material content. This, in turn, has had an impact on their product development.

The demands coming from customers depend heavily on what kind of customer it is. Professional buyers have better knowledge about not only the specific products, but also the demands of their own customers. If they start to ask for specific solutions, they normally have fast access to product development. However, in terms of environment, they usually don't. This is because when purchasing products, companies are always striving to find the least expensive product given that the quality meets the standards. But they will hardly ask a supplier to develop something that is even cheaper, better for the environment or more ethical. Because if they can't find it, nor will its competitors. On the other hand if a more environmentally friendly product is available to the same price, they will probably buy it. Purchasers in the companies we interviewed used the same logic:

“Of course we always look for the most environmentally friendly components. But, let's face it. We are not giant company. We can't ask suppliers, sometimes ten times bigger than we are, to develop specific components. And we can't abandon core components.”

Some of the companies often find that their customers don't really understand their environmental benefits. The disappointment is especially directed towards public procurement organizations where environment standards should have a relatively higher impact, but where this most often isn't the case.

“The public buyers do not know how to handle life cycle cost (LCC) and thereby to set buying demands that address environmental benefits. In addition they are

forced by the legislation to focus on price as the main indicator. Then it's hard for us to compete on other indicators.”

Even other buyers, such as large building companies, are quite often focused on price only as well. Some companies in the study think there is a need to include the user or the one who pays for the operation over time in the buying process, in order to let life-cycle costing and energy efficiency have an impact on the buying decision.

3.5.2 *Internal initiatives*

In most companies with a professional product development, a stream of ideas comes from the company itself. Not in an isolated context, but as conclusions and interpretations of market trends, potential future demands and competitor activities.

But there are also purely internal initiatives coming from the need for cost cutting or changes in working conditions in the company.

Cost cutting is rarely a main strategy among our interviewed companies. But when it is done, it often contributes positively to the environment. In Kinnarp office furniture company new materials are continuously scanned, as they are in the Ludvig Svensson and Nimo-verken companies. Normally the result goes hand-in-hand with ecodesign.

“We believe environmental concern comes with no extra costs. We are continuously looking for new materials and not least for materials that can reduce the weight. That will eventually lead to a product that is not only considerably lighter for the user, but also for the lorry and the work force. I think that speaks for itself.”

Such an indirect reason to develop new features is also mentioned by Tikkurila, the surface treatment company. In the company, employees prefer to work with water borne systems rather than solvent based ones, a preference that has had an impact on product development. This shows quite clearly that even human resources can be an important factor in ecodesign.

Our interviews in the other companies support this idea pretty well. Several companies told us they couldn't justify an environmental project if they neither were forced to do it (by law) or saw a clear commercial potential in it. But, almost in the same breath they highlight the involvement among the employees.

“After all, if you consider our dark winters, cold climate and high taxes, I guess our country's focus on the environment is what makes you want to live here. And that's an opinion I know I share with a lot of people here.”

This means it wouldn't be too controversial to say that knowledge and a positive attitude towards saving the environment have an indirect affect on product development, as well as on other processes in the companies.

3.5.3 Environmental concern and responsibility

Even though cost cutting and the personal incentives are important, the far most effective motivator is when the environment gets a place of its own in corporate strategy, often due to scanning of market trends or interpretation of future demands among customers. Here we haven't found much. In a sense companies such as Ludvig Svensson, Kinnarps and HÅG give us examples of companies that have been working with environmental issues for many years and have used this in their product development. But it has been more due to the owners and employees values than to a clear strategy. What's interesting is that all these companies feel that today the world is finally coming around and thus the market they have been ready to serve for a long time is created.

However, if energy savings in a broader sense are taken into account, Ludvig Svensson's product Svensson Shades is perhaps one of the greatest examples of how a company uses the know-how from its traditional products to create a completely different application area. The shades from Ludvig Svensson are used in greenhouses and enables the grower to control temperature, humidity and light. The company today has a market share of 60 per cent, world wide, covering more than 200 million square meters of green house soil. The energy savings the shades have made possible is equivalent to the power from three or four nuclear plants.

Another interesting ecodesign product we have studied is the energy efficient mixer from Gustavsberg. The challenge here has been to convince buyers who themselves aren't affected by the user economy, a task that hasn't been easy. The decision to develop the mixer was facilitated by a national technology procurement process, but the initiative came from the design department.

Also in Fagerhult, who has developed energy efficient lighting solutions using sensors to make the electric light adapt to daylight, corporate strategy has been the engine behind energy focus in product development. Like Kinnarps, HÅG and Ludvig Svensson the company also feel they are ahead of its customers who still buy equipment either based on price or on what Fagerhult considers as old-fashioned measures, such as watts per light bulb.

3.5.4 Legislation

Legislation regarding environmental issues is increasing, with examples like RoHS and WEEE that already have influenced the product development for electronic products. Legislation often does not take the full life cycle into consideration, tending to focus on such things as certain substances. The standby-regulations coming from EuP are also thought to have an impact on the future product development and will have an effect mainly on the use phase of the products. REACH, the coming legislation for chemicals, affect the companies in many ways, including administration, such as registration and management of chemicals and materials management such as substitution of certain chemicals in products. Among our interviewed companies most laws were considered neither a problem nor an asset.

“Laws are like a driving license. You have to pass the exam. But it won’t really impress your passengers if you do”.

Several companies were asked if they saw a potential competitive advantage in going even further than what the law says in terms of lower emissions or to switch components faster than they have to. The answer was a clear “no”.

However, as discussed above, it should be taken into account that if other values involved are perceived as more important to the customer, this is not a problem. This is perfectly demonstrated in the case of CALE Access. Their solar powered parking meters shouldn’t have any problems qualifying under a harder legislation on energy consumption or new standby regulations. But they did that not by addressing the problem of energy – but of installation and maintenance.

3.5.5 Environmental management systems

When starting to interview our companies, we were also interested in the connection between ISO 14001 and ecodesign, as well as in what direct influence the owners have on the company’s product strategies. One hypothesis was that private owners would be more interested in exploring and initiating ecodesign of their own will, based on personal attitudes. Some 80 per cent of the interviewed companies are certified according to ISO 14001. Historically this has increased the interest in ecodesign and many company representative recall that the certification process also started their interest in ecodesign. However, sometimes the interest has cooled when the customer response hasn’t proved strong enough.

Often the certification started as a result of customer demands, either large corporations that have to deal with certified companies given their own certification or public purchasers.

3.5.6 Public procurement and technology procurement competition

Many authorities see public procurement as a potent tool for creating a market for environmentally adapted products. However, one problem described by some of the companies is that public procurement is far too often focused only on price and not on environment and/or life cycle cost. There is a need to educate public buyers in how to treat environmental demands within the public procurement acts. It is also important that the public buyers have a closer relation with the users of the products, in order to take the use phase into consideration. Some of the companies in the study have seen large problems in selling environmentally sound products to public organizations due to the buyers focus on price, an attitude frequently blamed on the regulations.

Technology procurement competition was mentioned as a good tool. One interesting view was that it not only created a market, but also helped the environmentally interested persons to persuade their superiors that environmental issues are important and that there are customers wanting environmentally better products. The impact on the internal awareness for environmental issues was mentioned as important as the impact on the market.

3.6 Expertise and aid in ecodesign

Some companies in the study (the larger ones) have well-educated in-house experts taking care of ecodesign issues, while other, smaller ones with a strong interest in ecodesign use the ordinary development staff for ecodesign purposes. Internal education in ecodesign is used in some of the companies, where some have had a two-day course by an external expert in open to all people involved in product development. Other companies have shorter internal courses (2 hours) where internal experts describe the most important environmental issues for the company to the development staff. Some of the companies in the study have not had any education in ecodesign at all.

The companies developing environmentally better products often use the ordinary product development process to add the environmental improvements. If they focus on energy efficiency, they do a lot of testing and development to reach energy efficient products. If they focus on certain substances, they use material knowledge to obtain that. Some of the companies have tried Life Cycle Assessment (LCA) once in cooperation with external experts and have used the results from that to decide which are the most important things to focus on (such as energy efficiency), but they found the methodology too difficult to use for continuous testing.

Only one company in the study used many tools and methodologies for ecodesign, including Life Cycle Assessment (LCA), EIA checklists (Environmental impact analysis, based on FMEA), list of banned sub-

stances (grey and black lists) and Design for Recycling (DfR). Experiences from that company is that LCA is impossible to carry out in time to have an impact on the development of the products, since a full LCA needs a lot of detailed information only available when the development is already done. Simpler versions of LCA where more generic data is used to obtain a rough result can be used even in the concept phase of the development and thereby also have an impact on the development of the new products. Still they find the “full” LCA very useful for marketing and also to gain knowledge for coming development projects. Almost all companies told us that whatever is done, ecodesign must be integrated in the ordinary product development process.

“Environment must not only become the cherry at the top of the cake, but be integrated in the cake itself.”

3.6.1 Tools missing

The companies were all asked if they have any ideas about needed ecodesign tools that they cannot find on the market today. It is interesting that most of the companies, both small and large, and from all kind of industries, answered that they want a tool that is simple and quick enough to be used by ordinary development staff. Even the companies having environmental experts wanted such a tool.

Some of the companies also asked for a tool for calculating CO₂ and other greenhouse gas emissions from the product during its life cycle.

3.7 Use of eco-features in marketing

Several companies in our study use their eco-features in the marketing of their products. But most often it's not about the environment, but items that may be good for the environment as well.

Most common is energy efficiency. Fagerhult, Gustavsberg, Modul-System, Volvo, Ludvig Svensson, Nimo-verken and CALE are all using energy efficiency as an important argument in their marketing, both for their product categories, such as Ludvig Svensson's shades in comparison to fans or Nimo-verken with drying cabinets in comparison to tumblers, and for their own brands. Most often the arguments concerns the economic savings that can be made, but more and more often a smaller carbon footprint is highlighted.

Tikkurila is using its paint in its marketing, claiming that it is better for the environment, something the company has in common with other companies in the same industry.

Kinnarps would like to focus on the entire process including product development, production and logistics. This is more and more widely used in its marketing activities.

Being a competitor to Kinnarps, HÅG is also using their environmental performance in its marketing, including using the EPD as a tool to highlight their products.

3.7.1 Voluntary agreement and eco-labelling

Interesting in this perspective is that several companies that have the opportunity to certify their product with the Swan or EU-flower eco-label haven't done this. The reason has in every case been the same – it's too expensive and the criteria are set far too low. In the interviews, eco-labelling was very seldom mentioned.

Some companies described experience from eco-labelling. Tikkurila, for example, has some Swan-marked products in their portfolio, ones they consider as their lead brands. They find it important due to image reasons, but argue that the cost for the license is very high and that they feel eco-labelling is punished by the cost rather than supported. Håg, the Norwegian company, is seen as excellent on environmental issues and prefer EPD (Environmental Product Declaration) rather than the Swan, since they think the Swan-criteria are too weak. They mean that they will not benefit from the Swan since their products are so much better than just fulfilling the criteria, especially in areas that are not described at all or even supported by the Swan.

3.8 Incentives and barriers to ecodesign

Even if the companies are using design that improves environmental impact, they could do more. Most of the companies said this, but they saw little reason to.

3.8.1 Incentives for increasing use of ecodesign

As most company representatives were very clear of their *raison d'être* – that is generating more sales for the company, the incentive for working harder with environmental issues was quite easy to define as a wider knowledge among customers and the market at large about environmental issues and the potential effects of ecodesign (environmentally better products). This should increase the demand and thereby give eco-focused companies important advantages.

Internally, not least among top management, a wider knowledge would make it more likely that ecodesign would gain a higher priority. Several companies were also very disappointed with how public institutions handled their procurement.

3.8.2 Barriers to increased use of ecodesign

The discussion of barriers was in much the mirror image of incentives:

- Environmentally better components and materials are sometimes more expensive.
- Cost for product development.
- Technical limitations and lack of safe, long-term tested solutions – new solutions available, but they are not yet fully tested to ensure a safe product.
- The amount of work needed.
- Legislation
 - One example is the regulations from the Swedish National Board of Housing, Building and Planning (Boverket) for sanitary fittings saying that a tap in a washstand shall provide 12 litres/minute, even though 5 litres is enough and would lead to a lower water and energy consumption.
 - High voltage regulations say that you need a special tool to open up high voltage products, making it more difficult to take them apart for disposal.

3.9 What companies think authorities should do

The companies were asked the headline question and given some sub-statements to comment on.

3.9.1 Legislation and regulation

The interviewees were more positive towards legislation and regulation than expected. It was obvious that companies providing environmentally good products see stricter legislation as a positive thing, making their competitors work even more to fulfil them. For some issues, such as chemical substances where it is possible that the customers do not have enough knowledge to make demands, legislation is seen as the only way to improve the products.

Companies not providing environmentally good products see legislation as the only reason to improve their products: “Why should we use money and effort to create something which is not asked for by anyone.” They think that if a law tells them what to do, it is the same for their competitors and in that case they will not loose on the change. If they do it unilaterally, they only see a cost that the competitors don’t have. One company thinks that the legislation coming now on chemicals (REACH) is not sufficiently evaluated. They think that some of the consequences were not considered at all before the legislation was adopted.

One company thinks that the EU directives are not sufficiently harmonized, making it very difficult to fulfil and to understand what the rules are in the different countries.

Legislation has to be similar for imported products as for the domestic production. A concern raised was on chemical substances and when they are forbidden to use in production. Is it possible today to allow already finished products into the country from outside the EU, making it cheaper or easier for these producers.

3.9.2 Education

Good knowledge among the customers is considered very important, even if it takes some time from the education of youngsters until it impacts purchasing. It is not as easy to educate adults, which is why the main education has to take place in schools. Still buyer education would be very helpful.

3.9.3 Research and development

Research and development (R&D) increases knowledge, which can make even better solutions available. Applied research projects can also make experts available to the industry they otherwise could not afford, including experts in fields new for the companies. At the same time the cost for R&D can be shared between many companies and/or organizations. A common answer was also that the R&D has to be done in co-operatively involving both research organizations and industry, not by the research organizations in isolation. Many of the companies and persons also said that their interest of ecodesign started when they participated in some of the implementation projects done, such as the MPU program by NUTEK or similar.

3.9.4 Development of methodology

The companies think that it is very important to help increase the use of methodologies already available. Regarding new methodology, they speak about simple tools for life cycle assessment, simple enough to be used by non-environmental-experts. The tools must be reliable, robust and simple to use, providing key figures to be used in product development.

3.9.5 Taxes and subsidies

Some companies answer that they want tax reduction and/or subsidies for environmentally better products, while others think the opposite. One mentioned the example with subsidies for heat pumps, where the talk

about subsidies totally stopped a market that was flourishing before the discussion started.

The decreased German road toll is a success story for vehicles with lower emissions. That created a market for trucks with lower emissions and made people buy them.

The taxes on fuel and energy have an impact making it even more important for buyers to purchase energy efficient products. Some respondents also indicated that the low energy tax for industry makes it difficult to sell energy efficient equipment here, since the savings become smaller than for other organizations.

3.9.6 Information

The answer was that it is important that people like buyers and product users get a better knowledge about the environmental impact of different products, how to buy the right products and how they to use them.

3.9.7 Public procurement

If public procurement processes provide a market for environmentally sound products, the companies will develop these products. A problem described by some of the companies is that public procurement is far too often focused on price alone, basically ignoring environment and/or life cycle cost. There is a need to educate public buyers in handling the environmental demands in the public procurement acts. It is also important that the public buyers have a closer relation with product users in order to take the use phase into consideration. Some of the companies in the study have seen large problems in selling environmentally sound products to public organizations due to the focus on price supposedly created by the existing regulations.

3.9.8 Other

One idea mentioned was to develop a database (perhaps similar to Energy Star or the Japanese Top-runner System) with products with good environmental performance that could be used for customers interested in buying products with superior environmental performance. It could also support development of environmental better products.

4. Conclusions and recommendations

The conclusions made below are based on the literature survey and the company and expert interviews made. Following the conclusions we have included our recommendations based on the findings and using our own experience as described in the methodology.

To ensure the quality of the conclusions, they were also discussed with some other ecodesign experts³³ who agreed with them in general terms.

4.1. Companies develop to increase sales

Although the companies we have interviewed were different in size, industry, position and structure, they don't differ that much when it comes to the issue of ecodesign. Most companies we have met are working hard with important areas of ecodesign. However, *they normally don't see it as ecodesign*. Instead they talk about product features such as lighter weight, energy efficiency, higher quality, and the like. There is basically only one reason they are developing these features – that is *to increase sales*. Alternatively they state they try to maintain or increase their market share, which basically means the same thing, as the only way to do this is to increase sales.

There are, as described in the literature study, several ways to achieve an increase in sales. Companies can strive for lower costs and thereby charge a lower price to achieve higher volumes. Or it may develop new products or product features that either add value for a specific target market or make the product stand out from the crowd. Among the companies interviewed it's quite clear that the latter strategy is dominant. They add new features to current products and they develop new products for current customers. Year after year the products become a little more efficient, stronger, lighter, fancier and smoother.

This means most companies we met are using a 'focus strategy' that is built upon the perceived needs of current and potential customers. No company is deploying vast resources to decreasing their own costs – only

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- ³³ Carina Wiik, Advisor environmental issues, Federation of Technology industries, Finland
 - Niki Bey ph.d. IPU Produktudvikling, Danmark
 - Graham Adams, Ecodesign Expert at CFSD and PlesTech, UK
 - Karsten Schischke, Ecodesign Expert, Fraunhofer IZM, Germany
 - Mats Zackrisson and Hans Lennart Norrblom, Ecodesign experts, Swerea IVF

the customer's. Some companies design their products to stand out from the crowd, but still our feeling is that their "backbone strategy" is to focus on their main segment and basically offer products in line with competitors.

Only one company could be described as using a 'disruptive strategy', offering a product that really changed a market. However, in most of these companies this was not the case. Resources, financial as well as personal, in companies are scarce. Therefore, developing products that cater to new markets or new needs is not attractive when it's much safer and even more profitable, at least in the short run, to develop products that sell to established customers. For a company to maintain its position it makes sense to outperform its competitors in all measures. This leaves us with a situation where good, professional companies often behave as a crowd, where *the main incentive is to achieve more than their competitors*, but not necessarily much more than that.

This is something authorities must take into consideration when designing incentives that should encourage companies to adopt ecodesign practices. Companies that have grown large or at least midsized have done so by offering a range of products that have been appreciated by a specific customer segment. To change these products or what the products stand for is probably the last thing companies and its management board are prepared to do.

An overall recommendation is therefore to design ecodesign schemes that enable companies to use ecodesign principles within their current product strategy.

4.2 Ecodesign is often not an incentive by itself

In the companies we interviewed ecodesign has no fast lane. It is not considered more important than anything else, mostly because the lack of "eco" in product design is not a problem or aspect customers ask to be improved or solved. Instead, customers want product developers to address problems that are much more connected to their own situation, such as insufficient quality, lack of mobility, lack of flexibility, to low security and un-healthiness.

Of course, even environmental aspects such as increased global warming or polluted air can be a problem to be solved, but only when they actually are directly crucial to the customer.

When vegetable growers buy the Svensson Shades they do that because heating and cooling is their biggest expense, not because they want to save the environment. However, today they increasingly buy the shades so as to be able to create an environment where their produce can grow organically, because their customers are asking them for organic products. But – and this is interesting – not because consumers necessarily want more ecological products. They want pesticide-free products.

Luckily enough, that forces the growers to take care of not one but two environmental problems. And still they don't do it for the sake of the environment!

This is in fact one of our main findings in this study: there are from a company perspective no actual incentives for the concept of ecodesign.

Instead, there are incentives for product design and development, either because there are problems to be solved or opportunities to be exploited. Sometimes those incentives also strive for a better environment, not least now when global warming has become common knowledge. But more often they don't, which can also be accepted if they lead indirectly to a better environment anyway.

Even though there are no clear incentives for ecodesign there are barriers. Or, more philosophically, the lack of incentives is the barrier. The logic behind a product development project is that the result will yield far more money than what was invested. That can motivate the risk to develop something that no one ever promised they would buy. But, the higher the risks are, the higher the demands of return are. Most of the companies we have interviewed don't dare to promise those levels of returns for environmental projects, mostly due to lack of evidence.

This forces us either to *lower the risk to the invested capital* or work or to *educate about the possible returns*. If the latter is chosen, it's very important that the information is trustworthy and credible. *Our recommendation is to identify ways to lower the barriers for companies to develop new products.*

We see especially two important initiatives: *Support successful companies in areas where they can achieve competitive advantages*

Authorities should invest resources and support to companies based on what potential commercial success projects have in combination with potential environmental gains. The investment should not be based on specific principles or practices that should be used. The support could be *strictly financial*, or a *combination* of financial and expert support (such as R&D, process development, commercialisation, marketing).

Another important factor affecting the effectiveness of these programs is *time*. Many of today's support programs are not only specific in time. As it's unlikely that the needs of the companies and the will of the authorities will meet simultaneously, meaning that the effectiveness from both a company and an authority perspective will suffer.

Instead we *propose a long-term program with a broad scope*. It should be a resource when companies are asking for support, not when the program needs to find companies (i.e. *demand-driven*). In return companies should show how the new product or new feature will work and how it will be successful. Their plan should be the determinant. The more likely it is a company will succeed, the more possible funding should be. How much a program would grant should also be very flexible and should be decided case by case.

Technology procurement competition

Technology procurement competitions can be used as a tool to force the *development of new solutions* as they will set high criteria demands and simultaneously secure a certain market for the final product. It has to be used very carefully in order not to threaten the market forces unduly, while still supporting companies willing to improve their product range.

4.3 Regulations are perceived positively

Another important finding was that *legislation is not necessarily something companies oppose*. On the contrary, legislation is often asked for as companies see the need for becoming more energy efficient or to replace hazardous chemicals, but they gain no advantage in doing this either because their customers aren't aware of the need or their competitors don't have the same requirements laid on them.

To take action by own means and still profit from it takes a lot of marketing resources. The trick is to out-position the competition by reminding the market about how bad the competitors are and how good the products from their own company are. However, success in doing this takes a lot of time and resources and also puts the company's current position at risk, as it has to communicate other messages than it otherwise does.

Tougher legislation would encourage the environmentally "good" companies to take the next step, as the competitive advantage then will change to "complying with the legislation" instead of "going the extra mile." *Based on this conclusion we recommend authorities to let best practice guide legislation.*

This is especially important where there is no obvious customer demand, such as regarding certain chemicals. By doing so we give successful companies an incentive to risk the extra effort they normally can do, but haven't had a reason to try. It also gives them a better market, as their competitors who do not succeed will have to discontinue the sales or use their resources to invest in new technology. In either case this will remove poorly performing products from the market. The total market and industry will not suffering, even if the market shares might change from one company to another.

Legislation should be long-term and harmonized on a European level, or even global level where this is possible.

It is very important that the companies know that the legislation they aim to fulfil will be implemented and will, as well as knowing the timing for it in order to prepare appropriate and timely product changes. Therefore, *legislation must be thoughtful, consistent and long-term.*

4.4 Lack of enforcement of environmental policy

It is also very important that the legislation is *fair* and *enforced*, in order not to give any extra help to companies importing products. Nowadays many of the products on the market are produced in non-Nordic-countries or outside the EU, at times using a method or materials that are forbidden here. There is a frustration among several companies regarding the lack of enforcement of environmental policy and regulation. This concerns two different areas especially.

One is *public procurement* in which the companies find that environmental issues has not played any important role. Normally the single most important criteria is *price*, something that doesn't really encourage companies to offer environmentally better products, especially not in cases when this may make products more expensive.

The other area is *the use of forbidden substances and materials* that in imported goods, ones banned in products manufactured in the European countries.

Our recommendation is for the authorities to show the market clearly that "the worlds biggest challenge" is indeed their biggest challenge as well. This can be done by public procurement using environmental performance as a key issue.

It's crucial that authorities and public institutions are frontrunners in this market. Public procurement can be a good instrument for pushing the market in a greener direction, but very often today the public buyers only focus on price, saying they have to due to the public procurement act. Public buyers need to change behaviour by:

Use *environmental issues* as demands in public procurement. They might have to learn more about how to describe the demands correctly within the legislation public procurement act, in order not to be forced to use price alone at the end.

Calculating *Life Cycle Cost (LCC)* more often in order to evaluate such factors as energy use during use phase of the products. This might need more education.

Have a closer connection to the *end user* of what they buy, in order to *put relevant demands* on the use phase including energy cost. This is very often not the case today.

Also, the use of *banned* material in imported products should be better controlled and communicated among public buyers.

4.5 Difference in opinion between the industrial associations and the single companies

In the work with the EuP preparatory study one task was to discuss everything in detail with the stakeholders. In the case of Lot 3 (PCs and monitors)³⁴ there were many contacts, with single companies and with industrial associations. After a while, it became obvious that the industrial associations had to take a point of view that all their members could agree upon, making them rather conservative. In many cases, single companies requested much higher limits and harder restrictions than the industry associations could tolerate. The *industrial associations* usually take a *standpoint that all their members could agree upon*, usually making them *very conservative*.

As in the case of legislation we strongly believe that the opinions from the *leading companies* (front-runners) are much more profitable than from “somewhere in the middle”. When laggards identify the needs the change will be minimal. This leads to the conclusion that it is important for authorities *not to talk only with industrial associations*, but with *single companies* as well, in order to find out what is possible and feasible for the industry. *The purpose is to find the best performers.*

We recommend authorities establish relationships with individual companies rather than industry associations.

4.6 Knowledge leads to better products

The literature and survey shows that companies with knowledge about their products’ environmental impact, often use that knowledge to improve their products environmental performance, even if they might not call it ecodesign, but “energy efficiency” or whatever feature they improved. The knowledge can be gained by being involved in research projects and/or by doing life cycle assessments or other environmental assessments of their products.

We recommend to initiate government-supported programs for applied research and development, in order to create better knowledge in the companies about how to develop environmentally better products.

It is important that this work be done in *close co-operation* with the industry to have any impact. Implementing R&D programmes can also make it possible for the companies to start up ecodesign.

One experience from research and development projects in companies is that the process to start a project is very often far too slow. Often there is a call for proposal from a financing part, providing the rules (often very similar to game rules, such as rules for monopoly etc) for the projects. The projects are then initiated either by a company or a research organi-

³⁴ EuP Preparatory study, Lot 3 Personal computers and computer monitors, Jönbrink et al 2007

sation, trying to fulfil the rules, and then writing a proposal (deadline often some months after the call for proposal)! The projects have to fulfil all the regulations, such as number of companies involved, timing, budget etc, in order to have a chance to get funding. When all the proposals are gathered, it often takes some months until they are evaluated, and the projects get that information. Then a process where the contracts are discussed starts, taking some time as well.

Very often it takes a year from the first suggestion to create a project until it can start, and it is not enough adopted to the timing or the needs of the companies to have any major impact on their business. If there is a wish to support companies and have a large impact on their products, and their environmental impact, *the process must become much quicker*, and more *adopted* to the company needs.

Our recommendation is that the funding of research and development must become more flexible but also demand-driven, in order to provide better support for the companies in their core business when it comes to environment.

The *scope* should also be more *effect-oriented* rather than method-oriented. It's not necessarily ecodesign that should be promoted but such factors as energy efficiency, less hazardous chemicals and new fuels.

There are samples in the past, where the research and development funding was much more flexible than it usually is today. One of these was a research program, decided upon, and given to a technical officer and some experts, working together in a steering committee. They were in charge of the money and could start the projects very soon after the proposals, as long as they fulfilled the regulations, objectives and aims of the program. Proposals were made in cooperation between research organisations and companies. To ensure the quality of these projects, there were close discussions between the steering committee and the project group.

Another working system was to create similar R&D programs, but having a demand that the companies have to pay some percentage themselves. In some of these cases, one person, such as the CEO of a research institute, was in charge of the money, and could decide very quickly himself to start a project immediately as long as the project fulfilled the objectives and regulations of the program.

4.7 Ecodesign tools, available, but not used

There are a lot of tools for ecodesign available on the market, even if they are not so often used. It means it is no obvious lack of tools for ecodesign, even if many of the companies pointed to such a lack. Both large companies having huge development offices housing lots of experts, and small companies with only a few people working on product develop-

ment want simple tools which can be used by anyone, not only environmental experts. It seems, as even if there are many tools available on the market, they have to be further developed to better fit into the product development process.

Therefore we recommend support to develop simple tools that take the full product life cycle into consideration (i.e. impacts and costs) and that can be used by non-environmental-experts.

The outcome from the tool shall be key figures easy to understand by non-experts. However, one problem might be that if you provide such a simple tool, the results become quite rough and thereby not quite so useful. There is a need for research to better find the balance between the level of details, the degree of sophistication for the tool, and the simplicity to use it, in order to provide a tool simple enough to use, at the same time giving a useful result.

4.8 Eco-labelling does not have any major impact

Authorities often highlight and favour eco-labelling, while companies talk very little about it. Eco-labelling might be a sufficient tool for certain product groups where eco-labelling is relevant. But there are still enormous volumes of products sold in the Nordic countries where eco-labelling, and therefore product environmental criteria, is not yet possible. This is often due to lack of criteria due to small volumes of each product group, few companies interested, or other factors. Therefore, *the market share for products with an eco-label is minor* and the un-labelled product groups cover far higher sales volumes than the products for which eco-labelling is applicable.

Our conclusion is therefore that *eco-labelling might be good for some products groups*, but that other initiatives which can have an impact on the whole range of products, *can lead to much higher environmental improvements on a society level*, such as legislation banning different substances and materials and R&D support.

4.9 Set the rules – don't play the game

Finally, companies are not very interested in having authorities interfere with the market. It's understandable. A company is striving for maximum freedom. But even actions that are meant to be positive are often criticised such as subsidies or tax reductions. This, from a company perspective, authorities and politicians should act for long-term rules that are predictable and fair for both the companies and their customers.

We highly recommend authorities not be too specific in actions except when it comes to legislation. Promoting specific technologies, company

sizes or regions only creates an asymmetrical market and risk not take into account the organic power that entrepreneurship and business is based upon.

4.10 Further research and development

It seems like the term ecodesign is not the right thing to look for if you want to learn about industrial environmental performance.

There are many initiatives providing environmentally better products that are not called ecodesign however part of *the environmental product policy tool-box*. Among these are environmental management systems, public procurement and eco-labelling systems that might need further research to describe. Also, some detailed research regarding consequences of different kinds of legislation might be needed.

Research funding *methodologies* providing flexible and quick funding without hazarding democracy and fair thinking also need to be developed.

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- Marcus Wendin, O2 nordic (responsible for the pre-study)
- Mats Zackrisson and Hans Lennart Norrblom, Ecodesign experts, Swerea IVF
- Graham Adams, Ecodesign Expert at CFSD and PlesTech, UK
- Karsten Schischke, Ecodesign Expert, Fraunhofer IZM, Germany

Experts responding to the conclusions

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- Niki Bey ph.d.IPU Produktudvikling, Danmark
- Graham Adams, Ecodesign Expert at CFSD and PlesTech, UK
- Karsten Schischke, Ecodesign Expert, Fraunhofer IZM, Germany
- Mats Zackrisson and Hans Lennart Norrblom, Ecodesign experts, Swerea IVF

Appendix 1 Ecolabelling

Type I Eco-labels

"Eco-labelling" is a voluntary method of environmental performance certification and labelling that is practised around the world. An "eco-label" is a label which identifies overall environmental preference of a product or service within a specific product/service category based on life cycle considerations. In contrast to "green" symbols or claim statements developed by manufacturers and service providers, an ecolabel is awarded by an impartial third-party in relation to certain products or services that are independently determined to meet environmental leadership criteria. In Europe there are several national eco-labels, and other labelling schemes of which some are listed below.

- The European Union Eco-label – the Flower. www.eco-label.com
- The European Union Eco-label, the Flower, was started in 1992 and can be found throughout the European Union as well as in Norway, Liechtenstein and Iceland. The European Union Eco-labelling Board (EUEB) develops ecological criteria for product groups in close collaboration with the Commission. There are criteria developed for 26 product groups.
- The Swan. www.svanen.nu . The Swan is the official Nordic eco-label, introduced by the Nordic Council of Ministers in 1989. The Swan is well known in Sweden, where about 97% of the people know what it is and what it stands for. There are about 66 different product groups³⁵ having criteria labelled with the Swan and covering products in a wide range from toilet paper and hotels to dishwashers. The producers pay 0.3-0,4 % of their gross sales for the product to keep a licence. The criteria are developed in order to improve the environmental performance of the products and are revised when technology make it possible to further improve the environmental performance. The main objective is to provide ordinary consumers with information to help them buy environmentally better products.
- The TCO label . www.tcodevelopment.com . The TCO label is a global labelling scheme mainly for office equipment and best known for labelling computer monitors. The certificate has no geographical limitations and the label is present in markets in many parts of the world with the strongest base in the northern Europe³⁶ . TCO labelling started in 1992 and not only covers environmental issues, but also

³⁵ Telephone interview with Nancy Holm, the Swan, Sweden.

³⁶ Telephone discussion with Helena Nordin, TCO Development

addresses other issues regarding the work environment, such as image quality, visual and work load ergonomics, noise, electromagnetic and chemical emissions. One example is that today about 50 % of all computer monitors in the world are TCO labelled (about 2000 models).

- Energy Star. www.eu-energystar.gov . Energy Star is an energy labelling scheme first developed by the US EPA, but nowadays also used in EU, leading to some harmonisation. The Energy Star labelling scheme only covers energy, to the exclusion of other environmental issues. It is used for energy efficient office equipment, such as computers and imaging equipment.

Type II Self-declaration

Most Type II self-declarations are created by companies themselves and used in their product documentation and marketing material.

Ecma 370 (The former IT-Ecodeclaration)

<http://www.ecma-international.org/>

The IT-Ecodeclaration is a self-declaration, which was launched in 1996 by IT-företagen in Sweden. It was harmonised in 2006 and is currently by ECMA³⁷. Ecma International is an industry association founded in 1961 and dedicated to the standardization of Information and Communication Technology (ICT) and Consumer Electronics (CE). The IT-declaration has become a self-declaration used in the Nordic countries and for some years more common in other countries as well. The environmental criteria are based on the questions that need to be answered when purchasing a product. Both legal and ethical factors are included in the IT Eco-declaration.

Type III

The EPD[®] system

www.environdec.com

An environmental product declaration, EPD, is defined as "quantified environmental data for a product with pre-set categories of parameters based on the ISO 14040 series of standards, but not excluding additional environmental information". The EPD[®] system is a programme for Type III environmental declarations with an international applicability. EPDs are primarily intended for use in business-to-business (B2B) communication, but their use in business-to-consumer (B2C) communication is not precluded.

³⁷ ECMA 370

Use of eco-labelling and other voluntary agreements

Most ecolabelling is used to reach end users of products, while the EPDs are used in business to business. Even if the eco-labelled products cover many products used in households, they are not used very much within the B2B market.

Appendix 2: List of companies interviewed

Company	Size	Products	Ownership	Web-page
AB Volvo (Volvo Trucks)	72000 Empl	Trucks	Listed	www.volvo.com
AB Regin	75 Empl	Building management automation	Privately held	www.regin.se
Westerstrand	70 Empl	Time, sports and information boards	Privately held	http://www.westerstrand.com/
Modulsystem	?	Van racking system	Privately held	www.modul-system.com
CALE	100 empl	Parking ticket machines	Privately held	www.cale.se
Nimo-verken	250 empl	Drying machines	Privately held	www.nimo-verken.se
Coffee Queen	120 empl	Coffee machines	Privately held	www.coffeequeen.com
BT	Sales: 13 billion SEK	Electrically powered warehouse trucks	Part of the Toyota group	www.bt-industries.com
Tikkurila oy (Finland)	3800 empl	Surface treatment material (paint)	Listed	www.tikkurila.com
AB Fagerhult	1800 empl	Lighting	Privately held	www.fagerhult.com
Gustavsberg	500 empl	Sanitary fittings/water taps	Part of Villery & Boch	www.gustavsberg.com
Ludvig Svensson	950	Textiles	Privately held	www.ludvigsvensson.com
Uponor	670	Plumbing systems	Listed	www.uponor.com
Kinnarps	1000	Office Furniture	Privately held	www.kinnarps.com
HÅG	655	Office Furniture	Privately held	www.hag.no

Appendix 3. Interview guide

Personen (respondenten)

Vad heter du?

Vilken position i företaget har du?

Hur länge har du jobbat här?

Varifrån kommer du sedan tidigare?

Företagets position

Hur skulle du beskriva ert företags, och era produkters position på marknaden idag?

Vilka är era viktigaste kundkrav?

Vilka är era viktigaste marknader (såväl branscher som geografiska marknader)

Vilka är ägarnas viktigaste åsikter om företaget

Produktutvecklingsprocessen

Hur ser er produktutvecklingsprocess ut?

Vad är det som vanligtvis initierar utvecklingen av en ny produkt?

Hur viktig är kommunikationen med kunderna?

Hur viktiga är vad ni uppfattar som trender på marknaden?

Hur viktigt är ny teknik, nya möjligheter som upptäcks inom eller utanför företaget?

Ökade konkurrensfördelar

Hur viktiga är lagkrav?

Krav på ökad lönsamhet

Hur räknar ni Pay-off etc.

Ägarkrav

h) ...

Vem är drivande respektive beslutande i produktutvecklingen?

Hur, skulle du säga, ser er ambition ut i produktutvecklingen?

Förbättrar befintliga produkter

Utvecklar nya produkter som uppfyller tidigare behov på nya sätt

Utvecklar nya produkter som uppfyller helt nya behov

...

Använder ni olika typer av planlagda metoder eller verktyg i produktutvecklingen?

Vilka?

När i processen används dessa?

Miljö

På vilket sätt ser ni att miljöfrågor påverkar er produktutveckling?

Lagkrav

Kunder ställer krav

Krav inifrån (ledning och personal)

Miljöledningssystem

Framtida krav

...

Vilka livscykelphas och/eller komponenter i ert produktutbud påverkar miljön?

Vad gör ni åt detta?

Är ni långt komna?

Jobbar ni med ecodesign?

Varför

Sedan hur länge jobbar ni med det?

Har du eller någon annan stött på detta tidigare på en annan arbetsplats?

Hur har ni tagit till er det?

Har ni fått utbildning, använder någon särskild bok eller så?

Hur skulle du definiera miljöanpassad produktutveckling eller ekodesign?
[Vi fyller på med definition om ekodesign]

Hur ser konkurrentprodukternas miljöprestanda ut?

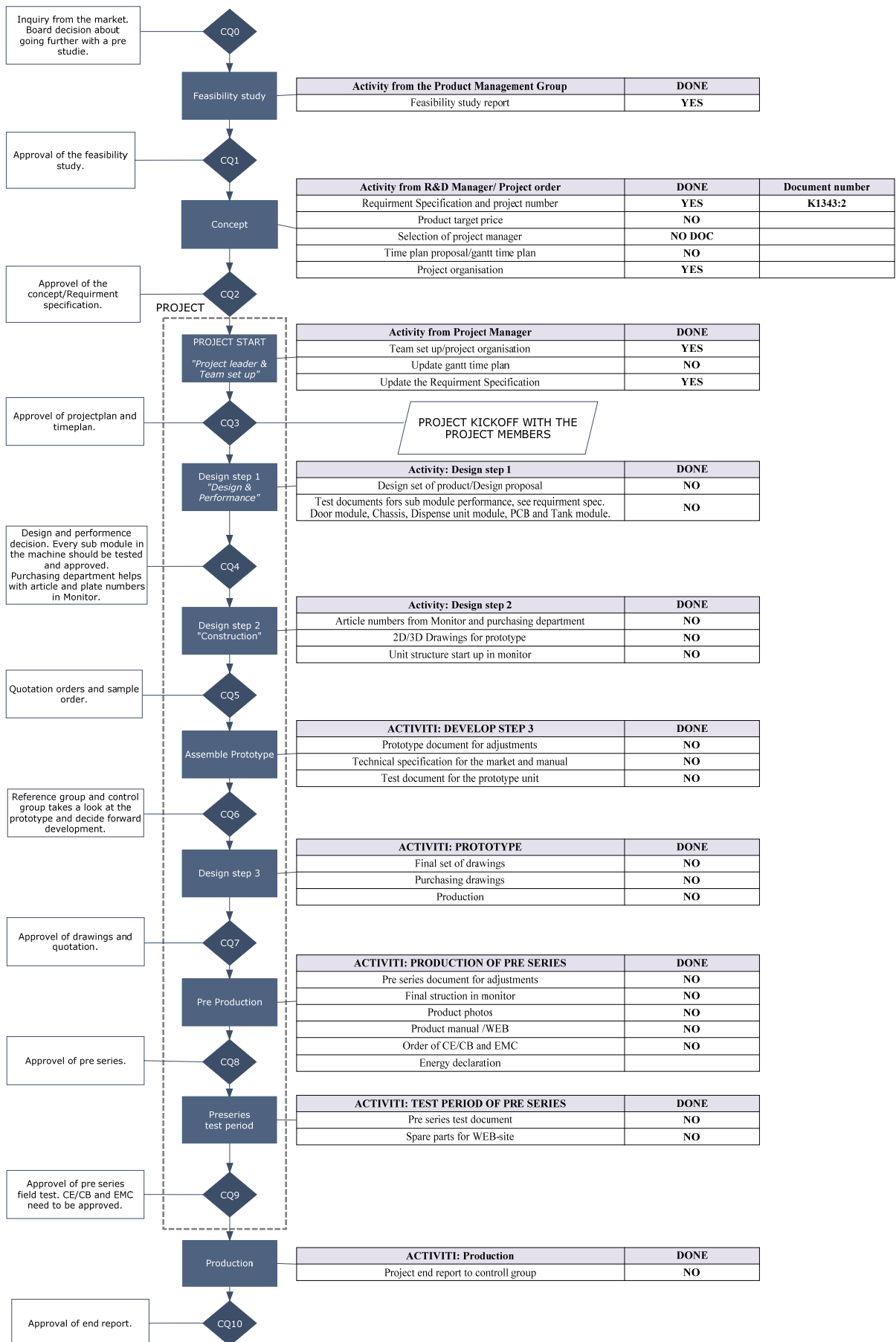
Använder ni några särskilda metoder och verktyg för ekodesign?

Vilka?

Hur använder ni dem?

Tillför de den nytta ni vill?

Saknar ni några verktyg för ekodesign?



The companies usually use some tools for their product development, very much depending on branch or size. Common tools used in the product development are project-planning tools, tools for geometrics such as CAD CAM, checklists for different purposes and product data management (PDM) tools.

Why start product development

In the companies interviewed, the initiative for new product development projects comes most often from customer demands. The customer demands are collected either by the sales force/marketing people, or are gathered more directly from interviews with their customers or end-users. Decision to start a project frequently comes from a board of experts/managers from market product development and production. In some of the smaller companies, the decision is made by one person, usually the CEO or the product manager.

How important is communication with the customers?

This question was very often answered by words such as “Extremely important”, “the most important information we got”, “tremendous”, “enormous” and similar.

Still a few companies described some problems in getting the right kind of information from the sales force.

How important are market trends?

The answers to this question showed a very high knowledge about trends in many companies.

The trends can be followed in different levels. For example, Coffee Queen has a very good knowledge not only about trends on the coffee machine market, but also about how people behave, what kind of cafés youngsters in different countries want to visit, what kind of coffee is used in different consumer groups and similar factors. Another example is Volvo, who tries to find out how people will live and behave in the future with a huge increase in population and the consequences of that for the transport industry and thereby for what kind of trucks or lorries will be needed in the future. For example, if we live in large cities, without cars, we want all food and other things to be transported all the way into the city centre, making it important to have silent and small trucks, because they have to fit in the city centre. Tikkurila follows now the garden trends, providing new surface treatment products to be used for “garden livingrooms”, which is one major trend for their branch. Fagerhult follows the office trends, such as if the offices have separate rooms or open-plan (landscape) office.

Some of the companies, mostly the smaller ones, only follow the trends in their own business, looking at the design, colours etc. used by their competitors, and not looking so much at the user behaviour in a broader

sense. One interesting finding regarding trends, is that for some of the products, the design trends, tend to decrease the lifetime of the products. Coffee Queen for example mentioned that on the big fairs, all the machinery shown some years ago was orange, which is a very special color, tending to look old-fashioned very soon, thereby leading to a quicker replacement of that machinery. If they use colours such as black, white or grey, the products tend to last longer.

How important is new technology, new ideas?

For almost all the companies, this was answered with “it is important to gather new ideas”. They often mentioned different ways to gather ideas and proposals from the employees, giving them some money or other encouragements for their ideas. In one company they have the best parking lot outside the office reserved for the “inventor of the month”. Many answers also pointed out that it is difficult to obtain a license for ideas from somebody outside the company, unless that person/organization already had the idea patented. It is difficult to handle the right to an idea without a patent.

How important is competition?

Competition is very important for all the companies in the study. Still the way to tackle it is very different from company to company and depends on the market position, kind of product and size of company. Some branches, such as the tap branch, have a very steady volume from year to year and from country to country (0.14 taps/person and year in all the European countries), making it impossible to gain any new market shares without knocking out the competition. Other branches can make the market grow. The companies in the study have different strategies for handling the competition. Companies providing products with a better quality and performance/function than their competition were most common in our study. Some of the companies use a prices low enough to beat the competition. Uponor for example has to keep a low price, since the pipes they are selling are just pipes and very difficult to differentiate from other pipes.

How important is legislation?

When new legislation comes, all companies have to follow it in order to stay on the market. For some companies, new legislation had a huge impact on the product development the last years. One company mentioned that approximately 3/4 of their product development the last 10 years has been influenced by new legislation. For the electronic products the RoHS and WEEE directives have been very important for the new development and for Volvo emission legislation and other vehicle and transport related legislation have been indicative. The EuP-directive was not mentioned as an incentive for product development yet. One company, Fagerhult, pro-

vides products covered by one of the first preparatory studies for the EuP directive and was thereby expected to be influenced, but they don't think it will have any impact on their products.

Those companies providing products with a good environmental performance mentioned that they want even stronger legislation, since they will benefit from that. They are already fulfilling higher environmental demands, for example regarding energy use of material content, and see that it is a disadvantage for them on the market if/when their competitors can provide worse products at a very low price. One of the examples of that is very cheap taps coming from China. These products often have very high lead content that can be dangerous to the users, and are banned in Denmark. In addition they do not help the user save any water or energy. For many buyers it is not so obvious that the tap can save a lot of use cost by providing functions to save water and energy and they focus on price.

To make "proper" legislation, it was also very clear from most of the companies, that it must be fair. For example the harmonization between countries and long-term planning were mentioned as important for development of legislation.

How important is demand on higher profit?

Most of the companies did not mention higher profit as the main incentive of product development. Still they told us that naturally there is a cost limit in both the production and the product development, one they strive not to exceed.

How do the owners impact on product development?

The main answers to this question were that the owners want a long-term profit from the company. Some of the owners point out ethical and/or environmental goals for the company in more general terms, but very seldom point out any specific regulations or goals for the product development.

Environment and product development

The companies in the study were asked how environmental issues impact their product development. One answer was that they take environment into consideration when it gives some kind of advantage, such as fulfilling customer needs better, giving a lower production cost, or provides some benefit for the user, such as a lower life cycle cost or a longer life. Interesting is that many companies did not say that product development provides these economic good solutions as "environmentally driven" although the result is a product with lower environmental impact. The environmental "label" or projects called environmentally driven, are projects providing a better environmental performance without any other

advantage and/or projects driven by legislation, such as banned substances.

The answers can be gathered into some groups depending on where the environmental issues belong. Important for this chapter is that some important things, mentioned above and also important for environment, will not be mentioned another time.

Legislation

Legislation regarding environmental issues is more and more frequent, such as RoHS, WEEE which has already influenced the product development for electronic products. Legislation often does not take the full life cycle into consideration, but focuses on specific substances. The standby-regulations coming from EuP are also thought to have an impact in the future product development.

Customer demand

Many of the companies have questions on specific issues, such as energy consumption, certain material content or other things from their customers, having an impact on their product development.

The demands coming from customers depend very much on customer type. In some cases, there are professional buyers, who have a better knowledge, and who can ask the “right” questions, in other case the customers does not have any knowledge to use for asking questions.

Professional buyers and their demands can also have an impact. Some of the companies, such as Gustafsberg, find that their customers often do not really understand the benefit from an energy efficient product, for example. In public procurement, the legislation “public procurement acts” have a huge impact and if the buyers do not know how to handle life cycle cost (LCC) and other environmental issues, they do not know how to set buying demands, and are forced by the legislation to focus on price as the main indicator. Even other buyers, such as large building companies, are quite often focused on price only. Some companies in the study think there is a need to include the user or the one who pays for the operation over time in the buying process, in order to let life cycle costing and energy efficiency have an impact on the buying decision.

Internal demand

For example in Tikkurila, the surface treatment company, the employees prefer to work with water borne systems rather than solvent based, also having an impact on the product development

Some companies also find that they can decrease the production cost by decreasing the use of energy and material in the production, meaning that environmentally sound changes become cost-driven. In a few companies, there is a will or determination among the employees to work

with environmentally sound products and there some impact on the product development can be seen.

Environmental management system

In some companies, the products and their environmental impact is an important environmental aspect, forcing product development to take the environmental impact into consideration. Some of the companies have key indicators for their environmental aspects, which force the development of environmentally better products. An example is the number of environmentally better products sold, compared to number not environmentally better ones from the product portfolio. One other example is a company where the packaging material has been pointed out as an important environmental aspect, and that has driven the product development into lower packaging needs.

Some of the environmental aspects are also connected to cost aspects (such as energy consumption) and is therefore double as interesting to handle in the product development.

Future demands

The focus on Global Warming is mentioned as one thing, which will probably have a large impact on both coming legislation, but also on future customer needs. Companies in the transport sector mention that lighter products will probably become even more demanded in the future. Energy efficiency, economy, lightness are words to describe the future from one company.

Public procurement

Public procurement is seen as a potent tool for creating a market for environmentally better products. A problem described by some of the companies is that public procurement is far too often focused only on price and not on environment and/or life cycle cost. There is a need to educate the public buyers in how to treat environmental demands within the public procurement acts. It is also important that the public buyers have a closer relation with the users of the products, in order to take the use phase into consideration. Some of the companies in the study have seen large problems in selling environmentally sound products to public organizations due to the buyers focus on price, claiming that the regulations force them to.

Technology procurement competition (teknikupphandling) was mentioned as a good tool. One interesting view was that it not only created a market but also helped the environmentally interested persons to persuade their superiors that environmental issues are of importance, and that there are customers wanting environmentally better products. The impact on the internal awareness for environmental issues was mentioned as important as the impact on the market.

Environmental profile of the products

The companies were asked about which stages in the life cycle or which components of their product have the highest impact. As can be seen from the product range covered by the study, there are products of all kinds, even though many of them are told by the companies to have the highest impact during use (energy use and/or emissions). It is interesting though that for some products having the highest impact during use (at least from the intuition of us as experts in ecodesign), the idea was that the most important factor is the substances in the components, and the end of life process. These answers came from companies NOT very experienced in ecodesign.

Some of the companies in the study consider themselves as providing good products from an ecodesign point of view. They have for example improved the energy efficiency of the products (Gustafsberg, Fagerhult, Volvo, CALE) or changed to environmentally better materials (Ludvig Svensson, Uponor, Tikkurila)

Coffee Queen told us that the high voltage legislation and the demand for recycling are not possible to fulfill at the same time, since the high voltage directive say that you need very specific tools to open a high voltage device, which makes it difficult for the recycler to take it apart!

Do you work with ecodesign?

Some of the companies did not even know the word! Most of the companies though said that they do work with ecodesign, even if it is not very formalized, but more focused on one or some main environmental issues, such as energy efficiency, lightness, substances.

The answer to question about reason to work with ecodesign had many separate answers for example:

- Legislation and customer demand, one of our core values since 1972
- Customer demand and that the wife of the owner wanted it
- Earn money
- Keep market shares

Some of the companies did very recently start with ecodesign, while others have worked with it for several years.

The reason to start with ecodesign depends very much on the people involved. Some companies started on initiative from the environmental management system (ISO 14000). Some other companies started as a result of customer demands and some was initiated by research projects in cooperation with external experts.

Education and staff

Some companies in the study (the larger ones) have well educated internal experts taking care of ecodesign issues, while other (smaller ones still

very interested in ecodesign) use the ordinary development staff for ecodesign purposes. Internal education in ecodesign is used in some of the companies, where some have had a two-day course by an external expert for all people involved in product development. Other companies have shorter internal courses (2 hours) with internal experts for the development staff, describing the most important environmental issues for the company. Some of the companies in the study do not have any education in ecodesign at all.

Tools and methodology for ecodesign

The companies developing environmentally better products often use the ordinary product development process to develop the environmental improvements. If they focus on energy efficiency, they do a lot of testing and development to reach energy efficient products. If they focus on certain substances, they use material knowledge to obtain that. Some of the companies have tried Life Cycle Assessment (LCA) once in cooperation with external experts, and have used the result from that to decide which are the most important things to focus (such as energy efficiency), but they found the methodology too difficult to use for a continuous testing.

Only one company in the study use a lot of tools and methodologies for ecodesign, such as Life Cycle Assessment (LCA), EIA (Environmental impact analysis, based on FMEA) Checklists, List of banned substances (grey and black lists) and Design for Recycling (DfR). Experiences from that company is that LCA is impossible to carry out in time to have an impact on the development of the products (* AJ comment depending on that a full LCA needed very much detailed information only available when the development is already done. For simpler versions of LCA, there is a possibility to use more generic data, giving a rougher result, but possible to use even at concept phase of the development, and thereby also having an impact on the development of the new products). Still they find the LCA very useful for marketing and also to gain knowledge for coming development projects.

Tools missing

The companies were all asked if they have any ideas about a tool to use for ecodesign which they miss on the market today. Interesting is that most of the companies, both small and large, and from all kinds of industries, answered that they want a tool simple and quick enough to be used by ordinary development staff. Even the companies having environmental experts wanted such a tool!

Some of the companies also asked for a tool for calculation CO₂ emissions from the product during its life cycle.

Marketing of environmentally better products

Some of the companies see themselves as providing the market with environmentally better products. The products were more energy efficient, giving less emissions, or using less hazardous materials.

- Gustafsberg provide a tap, called Nordic, which help the user to minimize the use of hot water, thereby saving water and energy during use.
- Volvo provide trucks with very low emissions and fuel consumption
- Fagerhult provide a light fitting with energy efficient light tubes and a sensor which measure the surround light (from outside) and person presence, and make the light fitting give exactly the right amount of light at every moment, saving a lot of energy during use compared to ordinary light fittings.
- Coffee Queen provide a coffee machine with a thermos instead of a hot plate, saving a lot of energy during use
- Uponor provides a Swan-marked compost container
- Tikkurila provides surface treatment products with less environmental impact than ordinary products
- Regin provides equipment helping house keepers to decrease the energy use
- Modulsystem provides van racking systems with lower weight, helping decreasing the fuel consumption for the vans using the equipment
- Ludvig Svensson provides environmentally friendly (ökotex certified) cotton products
- CALE provides sun-powered parking ticket machines.

Most of the companies think that their environmentally better products are welcome on the market, even if they find that public procurement does not really open up for buying energy efficient equipment or environmentally better products. Regulations on energy declarations for buildings help energy efficient equipment. Some companies used environment as an argument for the products, while some used other things, such as CALE, mostly talking about other benefits, such as no need to dig up the ground for the cables for the equipment.

One thing to keep in mind is also that even if the company provides a range of environmentally better products, it does not necessarily mean that these products are sold to all the customers. It is not enough to have the product on your shelf, it is also important that the customers buy them. Tikkurila for example mention that the Finnish paint market is quite old fashioned, and don't like new things, why they have difficulties in selling the environmentally better products! There is a need for customer education or information!

Technology procurement competition (teknikupphandlingen) was mentioned as helping the environmental interested persons to argue with

their superiors that environmental issues are of importance, and that there are customers wanting environmentally better products. That gave an internal demand for environmentally better products, providing internal support for ecodesign activities.

Voluntary agreement and eco-labelling

Interesting in this perspective is that several companies that have the possibility to certify their product with the Swan hasn't done this. The reason has in every case been the same: it's too expensive and the criteria are set far too low. Within the interviews, eco-labelling was very seldom mentioned at all. Some companies described experience from eco-labelling. Tikkurila have for example some Swan-marked products in their portfolio, which they consider as their flagships. They find it important due to image reasons, but argue that the cost for the license is very high, and that they feel eco-labelling is punished (by the cost) rather than supported. Håg, the Norwegian company, considered very good at environmental issues prefer EPD (Environmental Product Declaration) rather than the Swan, since they think the Swan-criteria are too weak. They mean that they will not benefit from the Swan since their products are so much better than the criteria, which is not at all described or even supported by the Swan.

Incentives and barriers to ecodesign

The companies were asked if there is something that would make them focus more on ecodesign. The answers were for example

- They could gain from a better overall knowledge regarding environmental issues internally and among customers
- The global warming discussions combined with oil crisis and energy discussions open up for products with low fuel consumption
- More customer demands would make us focus more on environment

The companies were also asked if there is something stopping them from focusing on ecodesign. The answers were for example

- Environmentally better components and materials are more expensive
- Cost for product development
- Technical limitations and lack of safe long-term tested solutions (new solutions available, but they are not yet fully tested to give a safe product).
- The amount of work needed.
- Legislation!
 - One example is the regulations from "boverket" for sanitary fittings saying that a tap in a washstand shall give 12

- liters/minute, while 5 liters is enough, and would give a lower water and energy consumption!
- High voltage regulations say that you must need a special tool to open up high voltage products, making it more difficult to take them apart at the end of life

What do you think the authorities can do to support ecodesign?

The companies were asked this question and given some paper to give their view upon.

Legislation and regulation

The answers were more positive legislation and regulation than expected! It was obvious that companies providing environmentally good products, see stricter legislation as a positive thing, making their competitors work even more to fulfill them. For some issues, such as chemical substances, where the customers can possibly not have enough knowledge to put demands, legislation is seen as the only way to improve the products.

Companies not providing environmentally good products, see legislation as the only reason to improve their products! “Why should we use money and effort to create something which is not asked for by anyone” They think that if a legislation tell them what to do, it is the same for their competitors, and in that case they will not loose on the change, if they do it themselves, they only see the cost, which the competitors don’t have.

One company thinks that the legislation coming now on chemicals (REACH) is not sufficiently evaluated. They think that some of the consequences were not considered at all before the legislation was decided.

One company find that the EU directives are not enough harmonized, making it very difficult to fulfill them and to understand what are the rules in the different countries.

Legislation has to be similar for imported products as for the domestic production. (Chemical substances, which are forbidden to use in production, can for example today follow already finished products into the country from outside, making it cheaper or easier for the producers to produce)

Education

Good knowledge among the customers is considered very important, even if it take some time from the education (of youngsters) until it have some impact on the buying. It is not so easy to educate adults, why the main education has to take place in schools. Still education of buyers would be very helpful

Research and development

Yes, research and development gives a higher degree of knowledge, which can make even better solutions available. Research projects can

also make experts available for the industry, which they cannot keep them selves, for example experts in fields new for the companies. At the same time the cost for research and development can be shared between many companies and /or organizations. Many of the companies also told that their interest of ecodesign started when they participated in some of the implementing projects done, such as the MPU program by NUTEK or similar.

Development of methodology

The companies think that it is very important to help up the use of methodologies already available. Regarding new methodology, they speak about SIMPLE tools for life cycle assessment, simple enough to be used by non-environmental-experts. The tools shall be reliable, robust and simple to use, providing key figures to be used within product development.

Taxes and subsidies

Some companies answer that they want tax reduction and/or subsidies for environmentally better products, while other think the opposite. One mentioned the example with subsidies for heat pumps, where the talk about subsidies totally stopped the market, which before the discussions was having a very high speed (ordvalet är knäppt, jag vet...)

A success story is for the decreased road toll in Germany for vehicles with lower emissions. That created a market for trucks with lower emissions, and made people buy them!

The taxes on fuel and energy have an impact, making it even more important for buyers to buy products using less energy. Some respondents also indicated that the low energy tax for industry make it difficult to sell energy efficient equipment there, since the savings become smaller than for other organizations.

Information

Yes, it is important that people in the society get a better knowledge about the environmental impact from different products, how to buy the right products and and how they shall behave when using them.

Public procurement

Yes, if the public procurement provide a market for environmentally sound products, they will be developed by the companies.

Other

One idea mentioned was to develop a database with products with good environmental performance, which could be used for customers interested in buying the right thing. It could also support development of environmental better products.

Experiences from ecodesign initiatives

Some of the companies have been part of ecodesign initiatives, but most of them not.

Teknikupphandling (kan inget bra engelskt ord nu)

One company, Gustafsberg, was involved in the “technology competition for energy efficient sanitary fittings”. One of the main benefits from that was that it showed to the decision-makers in the company that there was a market for energy efficient products. That on the other hand, made the decision-maker positive to the development project

MPU-programme and similar

Some of the companies, has been part ecodesign initiatives. One example is Fagerhult (Nutek MPU-programme, SVID-project). That helped them start with ecodesign, even if the project itself was not a success. The product and methodologies used in that project, was not further used afterwards.

Energy efficiency project (IVF)

Gustafsberg was part of one project with focus on developing energy efficient products. They think they got good help with the development of the product, and that one main benefit was that there was a person forcing them to continue the development, even if they were busy with other things.

med konkurrenterna inom områden man traditionellt förbättrat och vidareutvecklat.

Baserat på studiens resultat är rekommendationen att låta "best practice" styra lagstiftning. En svag lagstiftning skapar legitimitet åt eftersläntrande företag, samtidigt som den inte uppmuntrar duktiga företag att prestera bättre. För att identifiera vad duktiga företag faktiskt kan göra är det viktigt för myndigheter att ha kontakter med individuella företag snarare än med branschföreningar eftersom de senare representerar snittet eller eftersläntrarna snarare än toppen. Det är också viktigt att miljökritier implementeras tydligare och dessutom efterlevs i offentlig upphandling. Så länge offentliga organisationer inte köper bästa möjliga produkter ur ett miljöperspektiv elimineras stora viktiga marknader för miljöprodukter. Om pris är viktigare än miljöprestanda sänder man från offentligt håll dessutom en tydlig signal om vad som faktiskt räknas.

För att ytterligare stärka möjligheterna för företag att använda ekodesign på en oberäknelig marknad kan *stöd till forskning, utveckling och marknadsföring bli framgångsfaktorer*. För att detta ska bli framgångsrikt är det dock *viktigt att stödet är flexibelt och långsiktigt*. Istället för att i detalj stipulera vad företag ska utveckla utifrån ett myndighetsperspektiv, bör ramarna vara vidare. I gengäld bör kraven för stöd inkludera sannolikheten för huruvida företaget kommer att lyckas inte bara med utvecklingen utan med hela kommersialiseringen av den utvecklade produkten.

Slutligen finns ett *behov av mer lättanvända verktyg för ekodesign* och dess ingående processer. Detta är inte ett hinder idag. Allt som kan göra kunskapen om ekodesign mer tillgänglig och arbetet med det enklare kommer att vara positivt för att skapa en ökad användning av ekodesign.