

# Interpretations of corporate environmental policy: Challenges for environmental communication and action

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## Abstract

That products give rise to environmental impact during all stages of their life cycle, from raw material extraction to waste handling, is something that is increasingly recognised in society. Expressions stating an ambition to include a life cycle perspective in the environmental work of the industry have also spread to corporate environmental policies. In this research we are interested in how such ambitions are put into practice in industry.

Life cycle related environmental work is not only a matter for the environmental department. Actions taken in, for example, product development, sourcing and marketing may all influence the environmental impact of a product in a life cycle perspective. By interviewing environmental managers as well as representatives from operative business units in two companies (Stora Enso and SCA) we found considerable differences in interpretations of the life cycle concept and the environmental policies within the organisations. This is despite the fact that both companies have life cycle related product environmental work as a central part in their environmental policies and more than ten years of continuous engagements with, for example, life cycle assessments (LCA).

The paper examines the relations between life cycle ambitions expressed in the companies' environmental policies, how these are understood in various operative business units, and what is actually done to improve the environmental performance of the products in a life cycle perspective. The results show examples of diverging interpretations of the life cycle concept and the environmental policies and a fragmented understanding throughout the business process. It leads to an analysis of the role of the environmental policy and a discussion about challenges for product related environmental communication and action.

# Introduction

Today, it is possible to find a number of corporate environmental policies expressing an ambition to work with environmental issues in a life cycle perspective: "*Successful business requires a solid product life cycle-based environmental performance*" (Nokia 2005) and "*We are committed to reducing the environmental load in all stages throughout the entire life cycle of products and services, recognizing that responsibility for a product rests with its manufacture*" (Konica Minolta 2003) are but some examples.

From a societal point a view, this can be seen as a favourable trend away from focusing internal sites and processes. Many policy initiatives, notably more recent ones, aim to reduce the impact of products. Examples include the EUP (energy using products) directive or product take back schemes. There is also an ongoing discussion in the European Union about introducing an "Integrated Product Policy" (IPP), an integrated policy approach aimed to be "based upon life cycle thinking" (Commission of the European Communities 2003). In the general public, there are also indications of such 'life cycle logic' being referred to as the 'correct' way of viewing environmental aspects of products (Heiskanen 2002).

There are, however, many possible challenges to overcome before notions of the life cycle in corporate environmental policies result in actual application of life cycle thinking in business. Research on environmental policy implementation in general shows that there is a gap between policy statements and actual implementation of stated ambitions (James, Ghobadian et al. 1999). The practice of life cycle thinking as such is also far from unproblematic. Among the major challenges are that a product chain stretches across actors, nations and markets. A company that wants to make improvements from a life cycle perspective needs to evaluate and possibly even influence other actors to make changes in their processes.

In this research we are interested in how ambitions of life cycle work expressed in corporate environmental policies are put into practice in industry. For this, field studies identifying life cycle work have been made in two companies. The companies both belong to the same industry sector, have notions of the life cycle in their environmental policy, and long experience in life cycle related work.

## Theoretical perspectives of environmental policies and life cycle work

The theoretical basis for this paper is based on two bodies of literature: the role of corporate environmental policies for the environmental actions taken, and implementation of life cycle ambitions in general in industry.

## The role of corporate environmental policies

In the environmental management literature, great emphasis is put on the role of business environmental policies for environmental actions taken in industry. For example Brophy (1998, p 90) argues that: *"An organization's environmental policy forms the backbone and skeletal framework from which all other environmental components are hung ... if the policy is flawed then all environmental systems could be weakened and prevented from functioning effectively. The importance on an organization's environmental policy therefore cannot be overstated."*

A corporate environmental policy is part of the requirements for the environmental management system ISO 14 0001. In defining the concept of the environmental policy in this standard, the role of the environmental policy for setting objectives and targets are put forward (ISO 14001 1996). Another feature of the corporate environmental policy, often emphasised in the environmental management literature, is its role in informing employees of their responsibilities. The environmental policy should be detailed and specific enough to help employees define their future actions (see e.g. Brophy 1998).

The examples given above on the role of corporate environmental policies denote to an operational role for the environmental policy; as the basis for actions taken at both strategic and operative level. However, although the link between corporate environmental policy and environmental actions is clearly stated in the literature, empirical research report that there is often a gap between policy formulation and actual implementation in industry (see James, Ghobadian et al. 1999).

## Implementing life cycle ambitions

The principle of a product's life cycle is the basic concept for considering environmental impact by following a product during its whole 'lifetime', from 'cradle to grave'. It is based on the idea that a product gives rise to environmental impact throughout all phases in its life cycle, from raw material extraction through production, transportation and use to waste handling. Companies that aim to reduce the environmental impact from their products need to address all these stages in the life cycle. Such consideration of the life cycle implications of company activities are sometimes referred to as 'life cycle thinking' (LCT) (Baumann and Tillman 2004).

Application of LCT in industry may result in various actions. A typical example is the environmental department making life cycle assessment (LCA) studies. Life cycle related environmental work is however not a matter for the environmental department only. It has been argued that, when focusing products instead of the more traditional focus on processes, more emphasis needs to be put on various internal functions as well as external relations (Schmidt, Møller Christensen et al. 2001). Actions taken in, for example, product development, sourcing and marketing may all influence the environmental impact of a product in a life cycle perspective. In the literature, it is often considered necessary for LCT to be integrated in the business process (e.g. Pedersen 2001), along with having continuous support from top management (e.g. Saur 2003). Accordingly, ambitions to reduce the environmental impact of

products in a life cycle perspective need to be a matter of the whole organisation. But how is life cycle thinking translated when it comes to the operative functions of the company? Does it ever take off from the environmental departments and environmental policies of a firm?

## Research design

Two large enterprises in the Swedish forest products industry were chosen for our study on how expressed ambitions of life cycle work in industry are put into practice; Stora Enso and SCA. The reasons for choosing these two companies were several. The forest products industry is one of the most important industries in Sweden, in terms of both economic and environmental impact. They were also early adopters of the LCA methodology, and the chosen companies have notions of the life cycle in their environmental policies since several years. The selected companies further have each more than 10 years of experience with LCA work, continuous exchange of information for e.g. LCA studies and environmental education given by the LCA people.

## Data collection

This study is mainly based on data collected through interviews with representatives from the two companies. The interviewees were chosen in two steps. We wanted to interview employees that do not themselves carry out LCA studies, but who may consider, or come in contact with, environmental considerations in a life cycle perspective. These people were found by "snowballing", starting from people that the LCA-practitioners themselves identified as colleagues with which they had had recent or repeated contact with regarding life cycle related issues. Identified interviewees represented functional departments relevant for the business process in each company: marketing, research and development and purchasing (notably this list did not include production managers). In addition, interviews were made with environmental managers at both central and division levels, with special attention put to involvement in environmental policy and strategy.

17 persons were interviewed for the study, 9 at SCA and 8 at Stora Enso, categorized in four different functions: environmental managers and engineers (5), purchasing managers (2), research and product developers (6) and market and sales managers (4). The interviews were semi-structured, outlined as shown in Table 1.

Table 1. Guide for the semi-structured interviews

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The role of the interviewee at the company
In what way the interviewee comes into contact or carry out environmental work
Associations/translations of life cycle related concepts
In what way the interviewee comes into contact or carry out life cycle related work
Awareness and implications of the company's environmental policy
Reflections and comments

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The interviews were tape recorded and transcribed (all interviews but one where notes were taken). The results are mainly based on these interviews with some additional data of each company collected through environmental policies, reports and brochures.

Some preliminary results of the study have previously been presented in Rex and Baumann (2005). In this paper, results from the study will be presented with special attention paid to the linkages between companies' business environmental policies and the actions and interpretations by the employees.

## Company policies and practices

In this section, results from the study will be presented. The accounts given start with a short overview of each company and their environmental policies of today. This is followed by thoughts and intentions with the environmental policies, life cycle activities carried out, impact of the policy on employees' actions, and images and interpretations of the life cycle. Quotes given have been translated to English by the author.

### Life cycle concepts in business environmental policies

Stora Enso and SCA are two companies in the Swedish forest products industry, both being multi-national, large size enterprises with about 40 000 employees worldwide. The main products of Stora Enso are graphic and office papers, newsprint, packaging boards and wood products, and of SCA, absorbent hygiene products (personal care and tissue), packaging solutions, publication papers and wood products. Both Stora Enso and SCA are known in Sweden as companies having long experience with LCA work, with continuous engagement in life cycle related work since the early 1990s (for an account of this work, see Rex and Baumann 2004). Notions of the product life cycle have been included in policy statements of the companies for many years. Current formulations in the environmental policies are found in Figure 1.

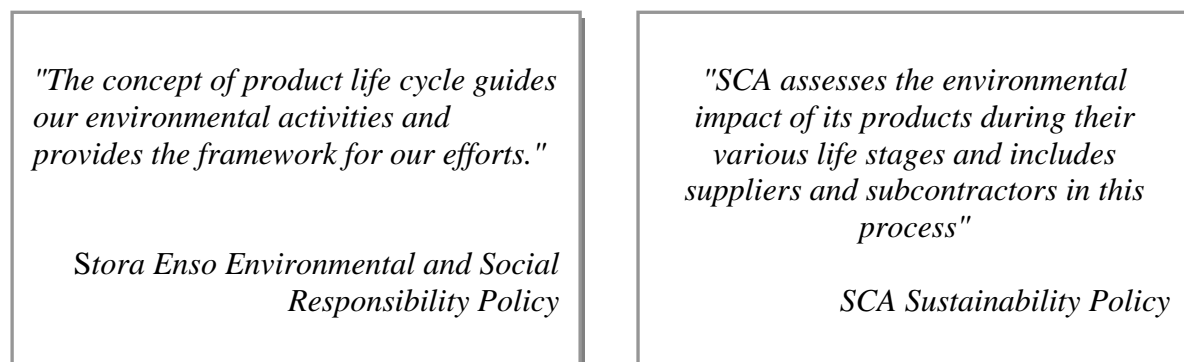


Figure 1. Notions of the life cycle in environmental policies of Stora Enso (2005) and SCA (2006).

## Stora Enso Environmental and Social Responsibility Policy

The Stora Enso Environmental and Social Responsibility policy dates back to 1999, after the merger of the companies Stora (Swedish) and Enso (Finnish) in 1998. As part of this merger, it was also necessary to decide on a common statement regarding environmental issues.

*"It was representatives from both sides that, so to speak, sat down and tried to write down the ambitions of the new company."*

*Environmental Manager, Central Level*

The ambitions included, among else, a life cycle perspective of company actions. One of the aims with including this in the environmental policy formulation was to highlight the role of Stora Enso as part of a larger product chain.

*"We wanted to describe that we had a broader perspective than the one ending with the factory gate."*

*Environmental Affairs, part of committee preparing the policy formulation*

With the policy, internal as well as external stakeholders expressed a desire to get the meaning of the policy clarified. This was done by the set up of a number of environmental principles and a corporate action plan with environmental targets. The first version of the group environmental targets was approved by the end of 2004, and included targets on emissions, energy and fibre acceptability (percent of traceable fibres). The action plan is updated yearly, aiming at pointing out the most important issues for Stora Enso to work with.

According to the vice president environment, there are no group environmental targets directly linked to the notion of the 'principle of the product life cycle' in the policy. Nevertheless, it is seen as important to break down the life cycle work into more tangible pieces:

*You have to break down this life cycle thinking into smaller pieces of a puzzle. As long as you have the framework clear. ... It is a pretty philosophical and academic field that has to be made more concrete.*

*Environmental Manager, Central Level*

Examples of recent actions taken in a life cycle perspective identified by the environmental manager at central level are: improved environmental performance of transports, implementation of a supplier evaluation system including questions of environmental management, and socially and ecologically acceptable fibre acquisition.

## SCA Sustainability Policy

As for Stora Enso, the sustainability policy of SCA is at corporate level seen as a way to express the environmental ambitions of the company:

*"When you measure the environmental impact of SCA, you will realize, of course, that how we act in purchasing also have an impact on the environmental performance, and that we have to recognise our responsibility for that part as well. " ... "[The environmental policy is] very much to express SCA's ambition around environmental issues" ... "It should provide guidance during a long period of time"*

*Environmental Manager, Central Level*

The target audience for the policy is both internal and external, including employees, finance, government, NGO and customers. The policy should be seen as a "point of reference" for all environmental actions taken within the company.

*"I think that if you would ask all our employees to tell you exactly what's in the environmental policy, probably not that very many would be able to do so offhand."... "it is, so to speak, a document to return to if you wonder where SCA stands regarding environmental matters"*

*Environmental Manager, Central Level*

The environmental policy is not systematically translated into objectives and follow-up. According to the vice president environment, there are no environmental targets at group level stemming from the notion of the life cycle in the policy. The usefulness of having this kind of targets at group level is questioned as for today. Instead, the policy in itself should be considered a statement that it is important for the company to take this wider perspective. The aggregation of product environmental information at corporate level is however seen as relevant to investigate for possible future implementation, not least because life cycle related issues are increasingly discussed in public policy.

At division level, there are some targets and guidelines with direct linkages to the stated life cycle ambitions. The division of personal care products is the most active one regarding life cycle related work. Notions of life cycle activities have accompanied the environmental policy of this division since the early years of 1990, and are nowadays considered an integrated and taken for granted part of the strategic environmental directions:

*"It has been there for such a long time that we did not really think about it. It was a matter of course because we have been working with it for... ...I wonder if it is not more than 10 years... so it was nothing to even think about really, it just should be there."*

*Environmental Affairs, part of the committee preparing the strategic directions*

Personal care is the only division identified where the notion of the life cycle has been made concrete in objectives and follow up, with the environmental department following-up on the number of LCA studies made and their results (see Rex and Baumann 2004).

## Life cycle activities

With life cycle activities, we mean activities taken that assess or improve the environmental impact of a product in a life cycle perspective. These activities can be carried out more or less consciously with regard to the life cycle. One example of a life cycle activity is to make life cycle assessment (LCA) studies. In this research, we were interested in identifying life cycle work also other than LCA studies, and carried out in departments also other than the environmental ones.

As "life cycle activities" cannot be considered a well known concept in industry, we asked about the respondent's tasks and responsibilities in general, and what they did that bear on environmental issues. The respondents were also, by the end of the interview, asked to identify activities or considerations done related to a life cycle perspective. From this, life cycle activities were identified and listed by the researchers. Examples are shown in Table 2. (The list should not be considered a comprehensive list of actions taken within the companies.)

Table 2. Examples of life cycle activities mentioned by respondents from various units.

<b>Sales and market managers</b>	<b>Research and product developers</b>	<b>Purchasing managers</b>	<b>Environmental engineers/managers</b>
Source reduction/reduce product weight	Reduce spillage	Evaluate purchased products	Evaluate purchased products
More efficient material	Source reduction/reduce product weight	Forest certification	Collaboration with customers
Reduce and reuse of packaging	Less material use per product	Supplier evaluation	Transports and logistics
Fibre traceability	More efficient material	Reduce transport distances	Supplier evaluation and communication
Forest certification	Customer advices (waste handling)	Recyclability	Fibre traceability
Reduce spillage	Renewable material		Forest certification
Ecocycling	More efficient transports		Reduce product weight
Reduce energy use	Order LCA studies		Efficient pallet use
Customer advices	Reduce energy use		Customer communication
Less material use per product			
Efficient pallet use			

As seen from Table 2, many examples of life cycle activities were found in all units studied. The life cycle activities identified mainly belonged to one of the following categories: material reduction in design (less spillages etc), more efficient transportation and logistics, more efficient materials (less material per function), supplier evaluation and requirements on purchased products and material, and customer communication and collaboration for reduced environmental impact. Life cycle activities from most of these categories were brought up by all departments and functions. Although some trends exist, the various life cycle activities identified could not clearly be linked to any specific function. However, some expressions seemed to be more used in one company than the other. "Source reduction" was a central expression used at Stora Enso, while at SCA, the focused actions by the employees were on "material efficiency" and "efficient pallet use".

It should be noted that the selection of what is considered to be a life cycle activity or not was made by the researchers. In fact, most of the work listed above was not spontaneously associated by the interviewees as important in a life cycle perspective. In some cases it was not even associated to environmental improvement but to other improvements, often cost reduction, but also product performance and logistics:



*"No, I can't spontaneously think of any [activity having a life cycle perspective] ... We are optimising for economical reasons. And this matter with [recycling of] Y is a practical issue."*

*Market Manager*

*"It was not really stated in the brief but just happened. We saw that we could compress them [the products] and then we could have less packaging and what followed from that was that we earned money on the transports."*

*Product Developer*

*"But if you consider that the entire China will buy these kinds of products then there will all of a sudden be huge amounts of them. And I think that's a little scary. ... well, that all these X [products] will be laying around all over. Will there be enough space for them?"*

*Product Developer*

## Internal implications of life cycle statements in corporate policy

Environmental managers aside, there was generally low awareness among the interviewees about the content of the environmental policy of the company. Some respondents were not sure where to find it and many of the respondents seemed totally unfamiliar with the notion of the life cycle in the policy. The lack of objectives and follow up from the policy regarding product related environmental issues was occasionally brought up by the respondents as a disadvantage:

*"This long term [environmental issue] that is not really important, or should I rather say really urgent, because indeed it is important, it often ends up pretty far down the list, unfortunately. That is, if you don't include it in the objectives."*

*Market Manager*

*"There are too few goals at product level, in my opinion. So, I consider it as my task to introduce some more tangible [targets] concerning products."*

*Environmental Affairs*

When confronted with the policy, most respondents failed to see any connection between the notion of the life cycle and their own work. Instead, life cycle activities were seen as being somebody else's business, as being too abstract or in other ways not directly applicable to their own work. Examples are given in Figure 2.

**Environmental engineer, (E)**

I: So, you do not consider the production [phase] of the products [that you use]?

E: No, I don't.

I: Is there any other person doing this?

E: If so, it has to be the purchasing department working with this kind of issues.

**Purchasing manager in the same company, (P)**

I: In your environmental policy, it says that the concept of product life cycle guides your environmental activities

P: That might be true

I: What does that mean to your work?

P: "the concept of product life cycle..."  
(Reads the policy). Well, that is a good question. What does that mean? They must have been thinking downstream [in the product chain]. From the gate of our factory and downstream. ... I wonder how they were thinking. But I believe it is downstream and not upstream.

**Environmental Affairs, (A)**

A: I will have to spread the message about this internally in the organisation as a whole. That could be the product development department, for example ... I really have to tell them that this exist [the environmental policy] and that they should follow it in their work.

**Product developer in the same company, (PD)**

P: There was a man here who gave a presentation [about environmental issues and strategies] a while ago. I don't know exactly what it was all about, but it was about how you regard various environmental issues. ... The strategic part of it.

I: When he talked about the more strategic part, did you then feel that this is how to implement it in my own work. That you could do something?

P: I guess it was at such a high and strategic level and looking so far ahead, that I don't know directly if I could use the things that he said. I don't think so. More than to incorporate the way of thinking. It should so to speak permeate the work I do, in some way.

**Sales Manager (S)**

S: Life cycle thinking implies a step back taking a little more global view that we often cannot handle because we cannot manage the customers to do it. ... So I see life cycle thinking as a little more comprehensive. And perhaps not exactly what I normally work with.

I: Who may work with it then?

S: Well, it could be the environmental department or maybe even the customers that perhaps may have a more open view. ... This [formulation in the policy] about all stages of the life cycle, it has to be [aimed at] product development. ... they need to be the ones handling it.

Figure 2. Extracts from interview transcripts, exemplifying an often observed phenomena of employees not being able to relate the notion of the life cycle to their own every day work. (I=Interviewer).

## Recognition and images of the life cycle concept

Hardly any of the respondents that did not work with environmental issues on a daily basis were familiar with the expression 'life cycle thinking'. The concept was more known of among environmental personnel, but not even in this category all respondents said that they had heard about life cycle thinking.

Although the concept of life cycle thinking was not widely recognised, all respondents had some associations to a product's 'life cycle', and were able to suggest an explanation for it. Some employees explained the life cycle as following the environmental impact from a product through the various stages in the product chain, from 'cradle to grave'. However, many of the respondents had other (sometimes parallel) interpretations of what is the life cycle, or life cycle thinking. Examples are given in Table 3. Some of the main groups of interpretations are further explained below.

Table 3. Examples of interviewees' interpretations of 'the life cycle', or 'life cycle thinking'

<b>Sales and market managers</b>	<b>Research and product developers</b>	<b>Purchasing managers</b>	<b>Environmental engineers/managers</b>
Cradle to grave LCA Sustainable development All parts of the product should be recycled Recycled raw material Environmental comparison of different systems fulfilling a certain function Material use per product Only use-phase	Cradle to grave LCA To look forward in the value chain Renewable products To reduce energy use T reuse and recycle Ecocycling Only use-phase Less resource-intensive The internal product development process	Cradle to grave From factory gate and forward Purchasing of energy and transports LCA To increase attention to product environmental issues	Cradle to grave Product chain LCA Less resource-intensive Continuous improvement That products have environmental impacts From production to recycling A philosophy

Besides cradle to grave, life cycle thinking was most often seen as a synonym to carrying out life cycle assessment studies. This was especially the case with people that had been working for a long time in the companies with, for example, marketing or purchasing.

*I: If I say life cycle, what do you think about?*

*PM: To be honest, I think of it as being a very difficult and complex tool*

*Purchasing Manager*

Another interpretation of the life cycle was to associate it to recycling and eco-cycles. Some people, mainly product developers, associated life cycle thinking to a compulsory take back and recycling of the product. There were also ideas that the raw material used had to be made from recycled material.

*"... you shouldn't give up until all parts that you have added to the product are well collected and returned to the eco-cycle."*

*Market Manager*

Yet another kind of interpretation of the life cycle was that the product should be made from renewable raw material. This interpretation was, for example, found among people working in research and marketing.

*"You can look upon it in two ways. Either you see it as that we only use trees that come from [sustainable forestry] that will be replanted and that's where we are today. That work is handled in a good way. Then you can take it further to include chemicals and other materials. That this should come from renewable sources."*

*Market Manager*

A product has various forms of life cycles. The physical life cycle as is referred to in life cycle thinking follows one specific product from its cradle to its grave. This was however only one of the life cycles the interviewees associated to. Other interpretations of the 'life cycle' by the interviewees were the economical life of one single product (including only the use phase), the time that a product exist on the market and the process of developing, producing and launching a product within the company.

Also following one specific product from its cradle to its grave is not without confusion. The respondents were sometimes confused with which product that the life cycle referred to. In the case of packaging for example, there was some confusion if the product to study was the packaging itself or the packaged product.

The examples given above account for the major types of spontaneous translations of life cycle thinking made by the interviewees. It shows that life cycle thinking can be interpreted in many ways. The various images of the life cycle are not wrong, but represent different and limited parts of the life cycle concept. Various interpretations found are illustrated in Figure 3.

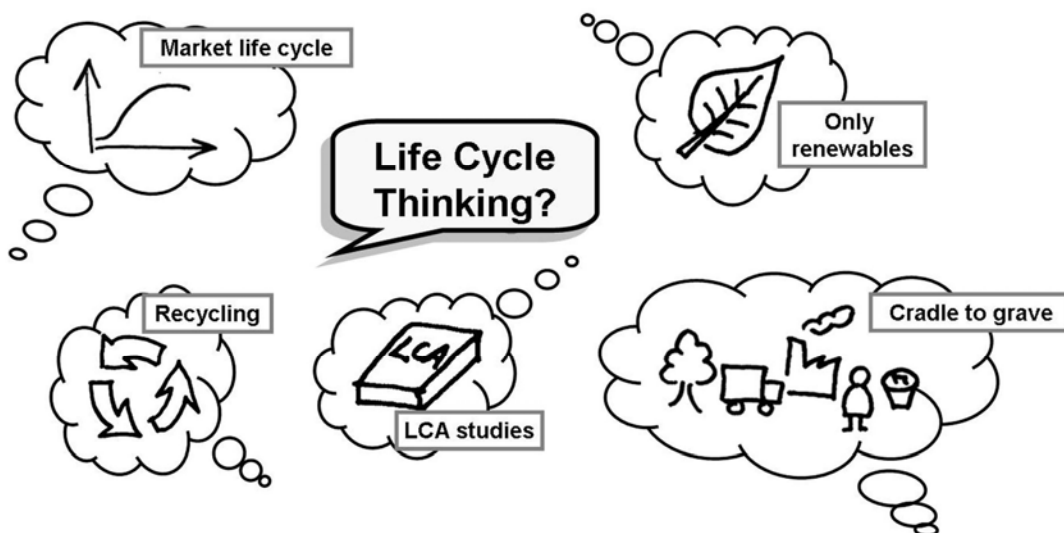


Figure 3. Examples of various interpretations found of 'life cycle thinking' (Rex and Baumann 2005)

Although examples are given above on where in the organisation the various translations of the life cycle was found, it should be noted that it was not possible to denote any specific interpretations to a certain department or function. Interpretations differed both across and within departments and functions. Following a basic business process within the companies, from marketing, through research, development and purchasing to sales and consumer communication, the images and meanings of the life cycle shifted markedly among members in the same business process. It should also be noted that the divergent interpretations of the life cycle also had an impact on what the respondent spontaneously saw as being the application of such way of thinking:

*I: Have you heard about any life cycle concept?*

*PD: No, no I have not*

*I: Nowadays companies and industries are talking about life cycle thinking. ... What do you think that is?*

*PD: Perhaps that it is, like, should go in a circle, that you should be able to reuse and this big eco-circle.*

*I: What would that mean to Z [the type of product you develop]*

*PD: Maybe it would mean that you should compost it*

*Product developer*

## Analysis and discussion

The results from the study are interesting to analyse in various respects. Before going into details on the role and implementation of the corporate environmental policy, some conclusions are made on the findings related to the various translations of the life cycle concept.

### Multiple translations of the concept of product life cycle

The results from the interviews show that there are multiple translations of the concept of the life cycle in the organisations studied. Apart from life cycle thinking as thinking in terms of the 'cradle to grave' of a product, there were also many other interpretations. These other interpretations were not 'wrong', but represent different and limited parts of the life cycle concept. The finding of the divergent translations challenges a more or less implicit assumption among many promoters of the life cycle concept seeing it a 'self-explanatory' expression. The concept of the product's life cycle has for example been praised for its "enormous educational potential" (SETAC-Europe Working Group on Life Cycle Assessment and Conceptually Related Programmes 1997), as well as having a kind of 'intuitive' logic (Bengtsson 2000; Baumann and Tillman 2004). Based on the result of our study, however, we recommend caution with seeing the concept as self-explanatory. A general understanding of life cycle thinking in industry cannot be taken for granted.

Although this conclusion is based on a limited number of interviews in two companies, there are reasons to believe that it will be valid also in a more general sense. Our study was designed to search for people experienced in life cycle activities. The chosen companies are known for their active and long lasting engagement in life cycle assessment studies, and for having their own LCA practitioners offer education to the employees. The interviewees were specifically chosen for having had recent or repeated contact with the LCA practitioners in life cycle related matters. Hence, there are reasons to believe that the informants in our study are relatively well experienced in life cycle matters. Yet they had very divergent spontaneous translation of the life cycle concept.

The finding of the divergent interpretations of the life cycle has implications for those aiming to boost life cycle considerations in industry. It indicates that ambitions such as "life cycle thinking needs to become second nature for all those who come in contact with products" (Commission of the European Communities 2003) also will be an educational challenge, along with the complications outlined in the introduction of this paper.

## Failure to connect to the policy

The results of the interview study show that many of the respondents were not familiar with the content of the environmental policy, some not even knew where to find it. This is possibly not very surprising results in companies having more than 40 000 employees worldwide. What might be a more important observation to analyse is the many respondents failing to connect their own work with the life cycle ambitions expressed in the environmental policies. The existence of such a gap between environmental policy statements in general and implementation has been recognised also by other researchers (James, Ghobadian et al. 1999). Thompson (1997, in James, Ghobadian et al. 1999) explains this gap with a lack of congruence between organisational context, values and resources. In our specific application, that of a life cycle perspective, we could point to internal communicative challenges as one barrier to policy implementation. The respondents' failed to link life cycle work to his or her own tasks and responsibilities at least partly because of an incomplete understanding of the concept of the product life cycle. In fact, because of the only limited parts of the life cycle included, the interpretations sometimes even prevented the respondents to do the connection to their own work. However, also employees having a decent interpretation in the first run failed to link the concept to their own work and responsibilities.

## The role of business environmental policies

According to the literature, the business environmental policy has several roles significant for the environmental actions taken: being the very framework, a basis for targets and a direction for employees. These suggested roles of the policy was only partly recognised and applied in the companies studied. The environmental policies were at central level seen as having the role of communicating an environmental *ambition*, internally and externally. They were however not

seen as as operative as suggested by the literature, at least not when it comes to life cycle related work.

One example is that none of the companies used the policy formulation in question as a basis for corporate environmental objectives or targets (as suggested, for example, by the ISO standard). An argument given for the lack of targets and objectives was that this might not be relevant at central level. However, also at a local level hardly any targets were found to advance the life cycle ambitions stated in the environmental policy, (the few exceptions being a matter of the environmental department). The lack of product environmental objectives and targets were put forward by some of the respondents as a barrier to prioritising this kind of work.

Another indication of the less operative interpretation of the policy is the usefulness of the policy as guiding the actions of the employees. This role of the policy is much emphasised in the environmental management literature. However, statements such that employees probably won't know what's in the policy and that you have to make the expressions more concrete witness about managers not being too optimistic about the usefulness of the policy as providing guidance for the every day work of the employees.

## Are the companies successful in their ambitions?

Both companies agreed on that the policy was intended to signal the importance of having a life cycle perspective on the companies' actions in terms of looking wider than the processes directly controlled by the company. Whether or not the companies have been successful in implementing this ambition is a multi-faceted issue.

In our interviews, we looked for activities that the respondents identified as relevant in their work and which may reduce the environmental impact in a life cycle perspective (this last classification was made by the researchers). Such 'life cycle activities' were easily identified in all operative departments studied. Material reduction in design, measures taken for more efficient material (hence needing less material per product), and reduced amount of transports needed were central parts in the every day work of many respondents. Evaluation and demand on suppliers and purchased products as well as customer communications may, depending on their nature, be other examples of life cycle activities mentioned by the respondents.

The many life cycle activities identified at various departments signal that the companies indeed look wider than the processes controlled by the company. It is not clear whether this work stem from an active and conscious strategy to reduce the environmental impact in a life cycle perspective, or whether this happened to co-develop with other aims and objectives within the company. An observation from the interviews was that the respondents did not seem to associate the identified life cycle activities with environmental improvements. The work was not foremost seen as aimed towards reducing the environmental impact, but linked to other aims of the company. Many of the life cycle activities most focused on were, for example, motivated by cost reductions.

Regardless of the primary intentions of the activities, the above observation points to a need for reflecting upon the implications of different framings of an activity and what impact this will have on peoples' actions. Life cycle activities carried out 'unconsciously' with regard to the environment could in one respect be considered a very good integration of environmental ambitions. However, there may also be a risk in people not recognising the environmental aims and ambitions of the company, hence not being able to, or perceive the importance of, contributing to this work. Moreover, as long as the life cycle ambitions are only 'implicit' and not translated into objectives and targets, they will not be as visible in case of trade-offs between various objectives.

A somewhat related reflection from the interviews is that of a delicate balance between the 'means and ends' given an ambition to work with life cycle related issues in industry. Stora Enso, for example, recognises that the concept of the product life cycle is too 'academic' for the employees and needs to be made more concrete. The various interpretations found of the life cycle also supports that the concept need further explanation. However, with the environmental managers doing this translation and communicating the 'means' of the work, there seem to be a risk in employees losing sight of the 'ends'. Let's take the supplier evaluation system as an example. The environmental manager at central level in one of the companies specifically pointed out supplier evaluation as an important life cycle activity of the company. Such a system has also been implemented in the company. The purchasing manager however, failed to see the link between the supplier evaluation and the life cycle expressions in the policy.

It is worth discussing whether it is important or not that all employees themselves understand the overall environmental ambitions of the company. In fact, this may require an extensive communicative effort while still being the environmental managers having most competence in initiating and prioritising environmental actions, for example. The answer lay probably within whether the aim with the life cycle ambition is to implement some specific actions or whether it is to be something that should permeate all actions taken and enhance initiatives and communication across departments regarding these kinds of issues. This latter view seems often to be the one suggested in the literature on life cycle thinking and life cycle management.

## Concluding remarks

By studying how life cycle ambitions stated in corporate environmental policies are interpreted and put into practice in industry we have been able to identify several challenges for product environmental communication and action: There was no shared understanding of the concept of the product life cycle, neither within, nor across departments and functions. Many of the employees, also those understanding the life cycle concept, failed to see any link between life cycle ambitions of the company and their own every day tasks and responsibilities. Moreover, many life cycle activities carried out were not associated to improvements in a life cycle perspective, but rather to cost reduction. These observations, along with an unawareness of the content of the environmental policy and a lack of objectives and targets stemming from the



notion of the life cycle, were identified as barriers to implementing the policy ambitions as part of the every day work of operative units of the company.

The life cycle concept is subject to multiple translations. We see that there are at least three translations necessary for the concept to become an operative and integrated part in the business process.

- Awareness and understanding of the concept of product life cycle in operative units of the company.
- Translation of what this concept mean in the every day work of each unit.
- Communication across departments.

Although it may seem like a communicative expression, the concept of the product life cycle is not self-explanatory and needs to be further explained. This conclusion should be kept in mind for all those aiming to boost life cycle considerations in industry; policymakers, researchers and environmental managers alike. This may be an extensive pedagogical challenge. The studied companies, for example, have both more than 40 000 employees and it should be kept in mind that they have already been working with education on environmental issues (including life cycle related work) for many years.

To implement the ambition in operative units, the concept of the product life cycle needs to be translated into every day work of the employees. A thorough discussion of the meaning of the product life cycle and possible implications for various business units may help the employees in this process. The translation can also be done by the environmental and strategic managers, for example, resulting in directives of undertaking certain measures.

The way chosen to translate the concept of the product life cycle into implications for every day work in operative units of the company will influence the ability for the third translation: communication across departments. Already-made translations into specific actions might become a barrier for active and conscious engagement by the employees, as the ends and overall ambition may be lost along the way. For employees to aim for the same objective, and help each other across functions and departments, the various images, expressions and objectives used need to communicate. For a corporate wide ambition to reduce the environmental impact in a life cycle perspective to become a conscious, shared and active part of the everyday work of all relevant business units, both the concept of the product life cycle and its implications needs to be understood and made common.

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