Green procurement: A matter of organisational change in Elsam

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Summary

Environmental communication in organisations has changed over time. Previously, it was mainly information on local environmental impacts aimed at neighbours and local authorities. Today, environmental communication addresses international stakeholders and includes both environmental and social impacts. Especially large organisations have changed both what they communicate and who they address. With an increased number of stakeholders distributed on a global scale, a discussion has evolved around how to address the stakeholders and the necessity for targeted environmental communication.

Numerous tools for environmental communication have been developed over the years, and in the work in the innovation consortium CEMIP (A Danish abbreviation for "Centre for effective communication in product chains") a number of tools are developed and applied in the participating organisations (Elsam, Vestas, Coloplast, Hartmann and Junckers). However, it can be questioned whether the focus should be changed from tools to social relations, as companies keep facing challenges in the implementation of the tools for green procurement.

In this thesis it is stressed that it is important, but not sufficient on its own, to develop tools to address green procurement; the conditions for implementation of the tools in an organisational context are also important. Focus is on analysing the implementation of green procurement in an organisation; thereby delimitation is made to focus on the internal stakeholders.

The thesis is motivated by the following research question:

How is implementation of green procurement influenced and facilitated by organisational subcultures?

The research question is answered by addressing the following sub issues:

- How can organisational subcultures in green procurement be understood?
- What are the similarities and differences in subcultures and green procurement practices in Elsam?
- How do organisational subcultures influence green procurement in Elsam?
- How can environmental practices be improved to facilitate the implementation of green procurement in Elsam?

The theoretical framework

This thesis has primarily an inductive approach and the theoretical framework is designed and applied as an interpretation tool. The theoretical framework is developed to analyse subcultures related to green procurement in Elsam. Three levels are in play in the analysis: The lifeworlds of the respondents, the subcultures in the department and the interaction between these subcultures.

A social constructivist approach has been applied in order to analyse how the purchasers and environmental coordinators perceive green procurement in Elsam. The concept of culture is applied to address the social constructs whereas the concept lifeworld is applied to address the individual constructs of the respondents. The lifeworlds of the actors are communicated by the individual and either corroborated within a given subculture or questioned in the interaction with other subcultures. Through corroboration collective meaning structures are established in the subcultures and this is what constitutes them as subcultures.

As the analyses progressed it became clear that the theoretical framework was not suited for analysing the interaction and translation processes between the subcultures without having two sets of comparable data collected over time. Translation processes focussing on boundary objects and brokers are therefore introduced as a means of analysing the translation processes occurring between the departments in Elsam.

The case study

The qualitative case study examines the lifeworlds of the actors involved in green procurement in Elsam. 14 purchasers and 10 environmental coordinators distributed throughout the organisation were interviewed. Besides this the empirical work is supplemented with stays at the central environmental department.

Three power plants are included in the analyses and they were selected with the intention of being as different as possible, especially focusing on their level of employee participation in the environmental work and their focus on external environmental issues versus occupational health and safety. Besides this, the central environmental department, the central purchasing department and the project department have been analysed as well.

The subcultures in the departments are subject to the same policies and procedures but the practices in the departments differ. The environmental policy is mainly seen as a strategic tool of relevance for the central departments whereas the power plants do not consider the policy when they prioritise their environmental efforts. As the policies are of limited relevance for green procurement, the subcultures in the departments become even more influential for their practices.

In Elsam the central environmental department, in collaboration with the other departments, has developed a green procurement procedure. The procedure was intended to be applied in all departments in Elsam but so far only the power plants have implemented the procedure. The central departments (Project Departments, Waste and Energy and to some extent also the Central Purchasing Department) have developed alternatives to the procedure. Consequently, the tools and practices in the green procurement differ from department to department and the goal of developing one common tool for green procurement in Elsam, namely a questionnaire for suppliers, has failed.

Only a few suppliers have been rejected based on the environmental assessments. The interaction between the suppliers and the purchasers related to green procurement is based on information rather than dialogue. The purchasers are not motivated for assessing the suppliers as they do not think that their efforts lead to changes in the selection of suppliers or will improve the practices of the suppliers. Thereby a self-reinforcing effect occurs: The demands set for the suppliers do not lead to any real changes and therefore the purchasers are not motivated to set new demands or in other ways implement green procurement practices.

The communicative practices in the departments also differ. Two forums are of distinct relevance for the communication about green procurement in Elsam; the environmental coordinator group (AMSG) and the purchasing group. In these groups the local coordinators and the purchasers communicate with their colleagues in other power plants. The communication between the central and local departments is less frequent and it is based on information and dialogue more than on actual collaboration. The internal level of interaction determines the purchasers' access to technical environmental knowledge and thereby the conditions for setting relevant environmental demands in the procurement process that actually leads to improvements. Another difference is the support the purchasers receive for implementing green procurement; some are supported by both the local management and the environmental coordinators and some have the opposite experience.

Recommendations for changes

The challenges identified in the case analysis form the basis for a number of recommendations presented in figure 1.

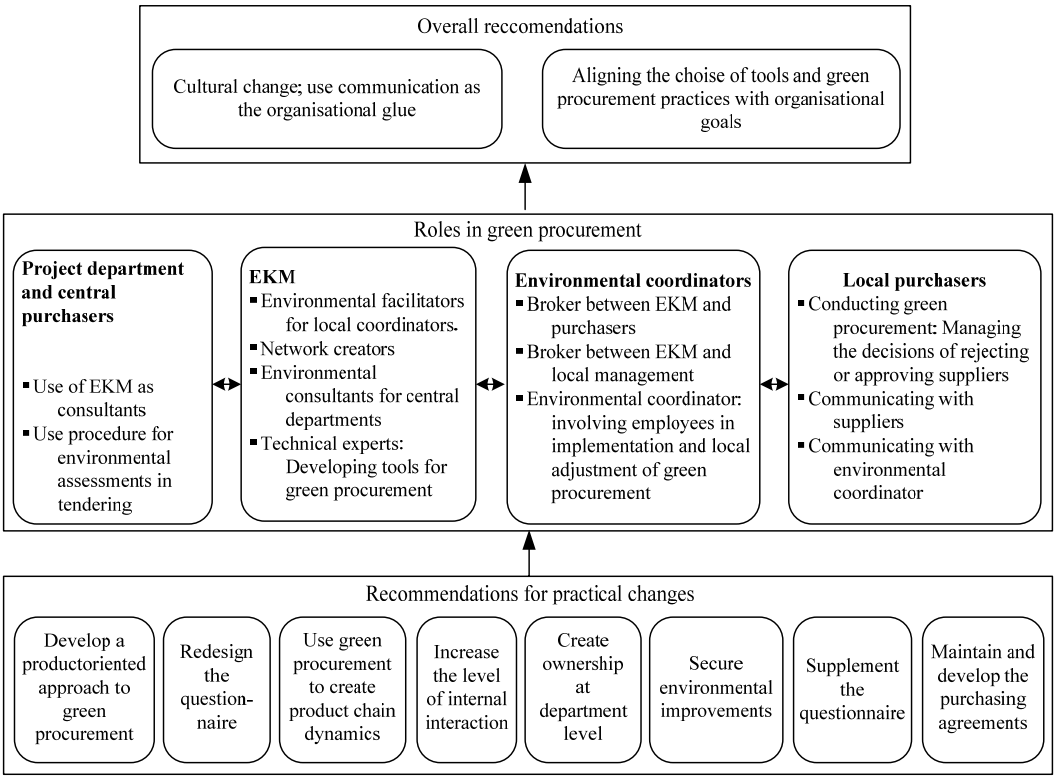

Figure 1 Overview of recommendations for facilitating the implementation of green procurement in Elsam. (EKM is the central environmental department.)

The challenges for green procurement in Elsam have their point of departure in the existing practices and artefacts. The analysis reveals a need for more flexibility in the artefacts that the purchasers apply in their practices, namely the procedures and questionnaire. Focusing on consensus in the creation of the questionnaire for suppliers, and insisting that the questionnaire is applied in all departments of the organisation has created barriers for the green procurement practices. In the bottom of figure 1 the specific recommendations for the current procurement practices are presented.

The recommendations for changes in the practices and artefacts form a fundament for recommending developments in the environmental roles connected to green procurement, presented in the middle of the figure. The environmental coordinators work as brokers to secure coordination and alignment between the perspectives of the central environmental department, the purchasers and the local management at the power plants. The brokers should have enough legitimacy to influence the development of green procurement practices and address conflicting interests.

Based on the suggested changes in the green procurement practices and the changes in the roles in the organisation two overall recommendations are developed:

1. *Change the culture to emphasise communication as the organisational glue.* The purpose of this recommendation is to shift focus from artefacts such as tools, procedures and policies to communication. This means, among other things, that EKM should have a more communicative role and that their position in the organisational structure should be reconsidered.

2. Align the tools and green procurement practices with company goals. To align the tools with company goals, it is necessary to distribute the technical competencies in the organisation. This can be done either by placing more technical competences locally or securing that there is easier access to these competencies.

The environmental efforts of Elsam have developed from focussing on the production to a focus on the products in a life cycle perspective. This has created challenges as new competencies and new environmental roles need to be addressed in the organisation. Environmentally proactive organisations around the world face similar challenges as their environmental efforts develop in a similar manner.

The climate debate, product oriented regulation and the increasing focus on CSR all call for supply chain management. Some companies see this as a potential for establishing a closer collaboration with the suppliers, and using them as partners that not only provide products but also knowledge and technology.

For companies to meet the challenges an environmental toolbox is not enough; environmental communication is needed to support both the internal and external coordination of environmental initiatives and knowledge exchange. This is necessary to be able to choose the right set of tools, implement them in a concrete context and thereby benefit from them in a way that goes beyond the symbolic values of applying the tools.

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Preface

The beginning of my time as a Ph.D. student was a turbulent travel through different research areas and various ideas. I was never in doubt that I would focus on life cycle management, and my main interest is the social interactions that are related to the implementation of the environmental communication and assessment tools.

When writing my masters thesis I started out as a life cycle technician and ended up with a much less technical focus, and this journey continued through my work as a Ph.D. student.

Participating in the LCM conferences in Copenhagen, 2003, Barcelona, 2005, and Zürich, 2007, has inspired me to focus on implementation of communication tools, as there is an abundance of research on developing methods and tools but limited focus on their implementation.

My supervisor, Arne Remmen, has accompanied me from the beginning of this journey and later on Jette E. Holgaard was also associated. A special thanks to Arne for challenging my ideas and taking a step back from time to time to see the larger picture of my work. Thanks to Jette for making me feel that you always believe in me, and for your tireless reading of drafts of chapters.

My research has been a part of the innovation consortium CEMIP -Centre for Effective Environmental Communication in Product Chains- with participants from companies as well as research institutions and a consultancy firm. I am grateful for having such a broad platform for my research. Best regards to the CEMIP working group: Egon, Kirsten, Satu, Susse, Kim, Kristian, Klaus, Charlotte, Erik and Mikkel. It has been a pleasure to develop and challenge ideas with you, and to establish personal relationships along the way.

Thanks to all the employees in Elsam who contributed in my endeavour to understand the actual practices in Elsam; you have all been open and interested in participating in interviews as well as providing materials for me. A special thanks to Egon Raun for supporting my work and commenting on my ideas; without having you as a main entrance to the organisation I cannot imagine how I would have managed.

I would like to thank Poul for supporting me in some turbulent years of my life, both personal and professional. Together with my family and friends you have been a great support. Thanks for always believing in me, and for telling everybody that my PhD focuses on energy.

Thanks to all the colleagues in the Division of Technology, Environment and Society; you each have your specific interests and particular experiences that have motivated my work and make this division a good workplace. Special thanks go to Henrik Riisgaard for listening to my ideas and critically challenging them and thereby helping me to develop both the argumentation and the content of the report, and for company when working evenings and weekends.

Most of all, thanks to mom and dad for supporting me in my studies. Dad, without you challenging me to develop a logical thought process, I would never have become an engineer and never initiated my academic career.

Aalborg, December 2008

Mette Mosgaard

1 History and background for environmental communication

The purpose of this chapter is to introduce the background for environmental communication as it is perceived today. This is done through answering the following questions: How have the perceptions of environmental problems changed over time? What is environmental communication and how is it linked to the perception of environmental problems? And who are the relevant stakeholders for the environmental communication?

The chapter describes the complexity of environmental communication through an illustration of five aspects:

- The perception of environmental problems has progressed from a local to a global aspect that encompasses both environmental and social aspects. (Section 1.1)
- There is a variety of sustainability indicators to consider. (Section 1.2)
- There are several principles (codes of conduct) to apply in the environmental communication. (Section 1.2)
- There is a variety of stakeholders with different interests to address related to global supply chains. (Section 1.3)
- Sustainability issues include both tangible and intangible value drivers for organisations. (Section 1.3)

Together these five aspects sketch the field of environmental communication today, both related to the content and the means of communication. The aspects show that the two main challenges for organisations are to develop strategies for their environmental communication and to implement tools that fit these strategies. Focus is on the conceptual, historical development in the chapter and therefore it is not described how for example changes in political focus have influenced practices within companies.

1.1 The perception and prevention of environmental problems

The development in the perception of environmental problems and corresponding pollution prevention strategies are presented with the point of departure in a Danish context. The purpose is to show that the perception of environmental problems has changed from a local to a global focus that encompasses both environmental and social aspects. This is important for environmental communication in organisations as it describes what the organisations are communicating about.

1.1.1 Environmental perception: from dilution to sustainable products

The perception of environmental problems has changed since the 1960 where the regulating authorities mainly saw environmental problems as local issues. This view rested on an assumption that the earth could cope with the pollution; it was mainly a question of diluting the emissions in order to distribute the pollution and avoid damages to the local environment. As the environmental impacts became more visible in the 1970s new initiatives were taken in the regulation of the organisations that focused on reducing emissions. Therefore, a filter strategy with end of pipe solutions was implemented, with the authorities setting the emission limits. The filter strategy often moved the problem from one source to another e.g. from wastewater to sludge that has to be deposited. (Remmen, 2001)

During the 1980s it became apparent that it is costly to apply end of pipe solutions and that the environmental problems often were moved from one place to another. (Colby, 1991) Therefore, the focus changed gradually towards cleaner technologies and pollution prevention. In the 1980s pollution prevention focused on reducing the amount of resources used in the production and emissions from the production. Often the organisations could pick low hanging fruits by implementing cleaner technologies and "good environmental housekeeping". This saved resources and gave economic benefits. (Remmen, 2001)

In figure 2 the development in perception of environmental issues from 1960 to the present is illustrated.

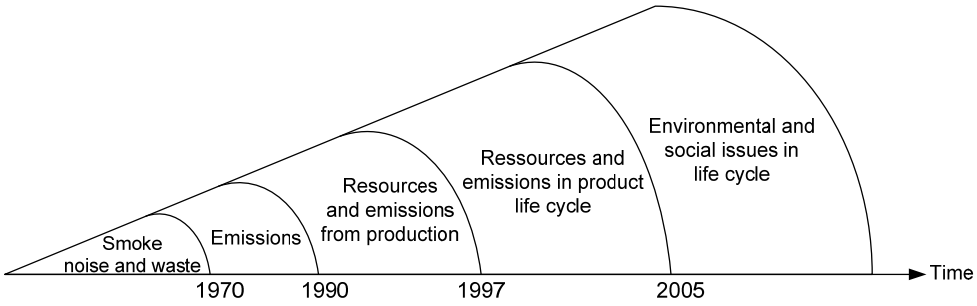

Figure 2 The development in the perception of environmental issues. The illustration shows the development in concepts, the practices may lack behind.

One weakness in the implementation of cleaner technologies was that the improvements were seen as single projects and "one shot" innovations in the organisations. (Remmen 2001).

Around 1995 the cornerstone in pollution prevention became environmental management either based on ISO 14001, EMAS or simpler models developed in the individual organisations. Implementation of environmental management changed the focus in pollution prevention from single projects to continuous improvements in the environmental efforts in the organisations. The main emphasis in the environmental work was still inside the organisation's own fence, focusing on the production processes.

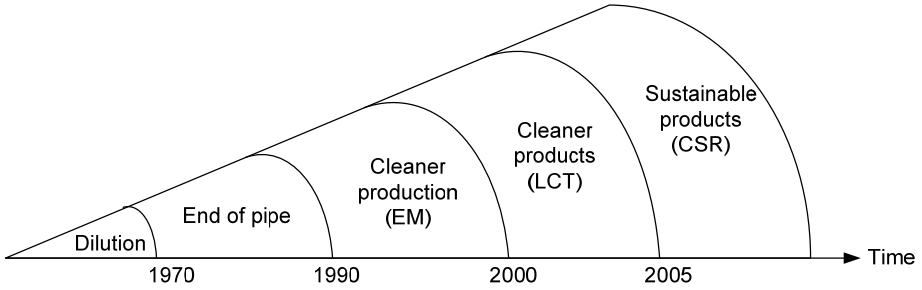

Figure 3 The organisational view on environmental issues. The illustration shows the development in concepts, the practices may lack behind.

By the end of the 1990s the focus in regulation shifted as it was realised that it is not sufficient to only address the production sites. The shift lead towards a product oriented view addressing the reduction of resource consumption and other environmental impacts from the production and use of products. This view includes the entire lifecycle of the products instead of just focusing on the production sites in the specific organisations. The response from the proactive organisations was to implement life-cycle thinking in their environmental practices and tools in order to identify the improvement potentials in the product life cycles.

The next big turning point in the perception of environmental issues was inclusion of social aspects; and thereby all three aspects of sustainable development were included. Sustainable development is actually a concept from the Brundtland Report dating back to 1987:

"*Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs."* (Brundtland, 1987)

It took some years before organisations began to integrate the social aspects of sustainability in their environmental initiatives, with some exceptions like Novo Nordisk and The World Business Council for Sustainable Development that were proactive. An example of this is the use of the concept of triple bottom line, which captures the expanded spectrum of values and criteria for measuring organizational success including economic, environmental and social aspects.

In 1999 Global Compact was introduced by the UN, setting sustainability on the agenda for organisations and their operations through the concept of Corporate Social Responsibility (CSR). Besides the environmental and economic considerations, CSR also takes social aspects such as human rights, labour rights and anti-corruption into consideration.

CSR as a concept has existed for many years, but Global Compact promoted CSR as an ethical and moral responsibility for organisations. Thereby the stakeholder relations changed from focussing on organisation-authority interactions to a broader stakeholder concept.

As the perception of pollution prevention was developed, the regulation changed as well from command and control regulation, setting emission limits and demands for waste management, to voluntary approaches including environmental management systems and CSR. Along this process, the number of relevant stakeholders has increased too. This is described further in section 1.3.

The historical changes describe how proactive organisations perceive environmental issues and how they respond to them in their environmental efforts. More resistant organisations have not reached the same level as the proactive ones; some organisations primarily see environmental work from a command and control approach and their level of pollution prevention closely follows the regulation from the authorities. It means that they to a limited degree include life cycle considerations and CSR.

1.2 Environmental communication – from regulation to voluntary approaches

The purpose of this section is to show that environmental communication has emerged and developed along with the perception of environmental problems described in the previous section. The focus is describing how organisations communicate about environmental issues.

1.2.1 Definition of environmental communication

Environmental communication is defined in various ways including differences in both content, level of interaction and actors involved. The definitions reflect the perception of environmental issues described in a previous section, but also relate to different levels of interaction in the communication process. This is illustrated in figure 4.

In the first version of EMAS (Environmental Management and Audit Scheme), from 1993, the focus in environmental communication is information (reporting).

In ISO 14001, from 1996, there is a demand for establishing procedures to control the significant environmental aspects of the goods and services provided by the suppliers. This leads to the development of supplier evaluation schemes and questionnaires and thereby a higher level of interaction in environmental communication.

The standards in the ISO 14020 series (Environmental labelling) do not define environmental communication as such, but their content reveals an increasing interest in environmental communication. The focus is labelling, and thereby the implicit understanding of environmental communication relates to information about the impact from the life cycle of the products. The first version of the ISO 14020 standards is published between 1998 and 2000.

In 2006 a broader standard (seen from an environmental communication point of view) is published. ISO 14063 (2006) defines environmental communication as:

"A process that an organisation conducts to provide and obtain information, and to engage in dialogue with internal and external interested parties to encourage shared understanding of environmental issues, aspects and performance."

This definition is more dialogue based than the narrow focus on labelling (provide information) in the ISO 14020 standards.

Outside the field of the standards there are examples of views on environmental communication that relate to a network view rather than an organizational view. In an organizational view no actors are placed in the centre of the network as all stakeholders have the same level. An example is Cox (2006) who includes aspects like NGOs, lobbying authorities and the media as important actors in public participation.

Cox (2006) uses the following definition:

"*Environmental communication means the pragmatic and constitutive vehicle for our understanding of the environment as well as our relationship to the natural world; it is the symbolic medium that we use in constructing environmental problems and negotiating society's different responses to them*."

The idea of seeing communication as a symbolic action is interesting as it implies that communication is not a one way process but that the "target group" is taking part in the process and that the interactions are important. The market or the target group as such sets the agenda based on their interests. (Højbjerg, 2002)

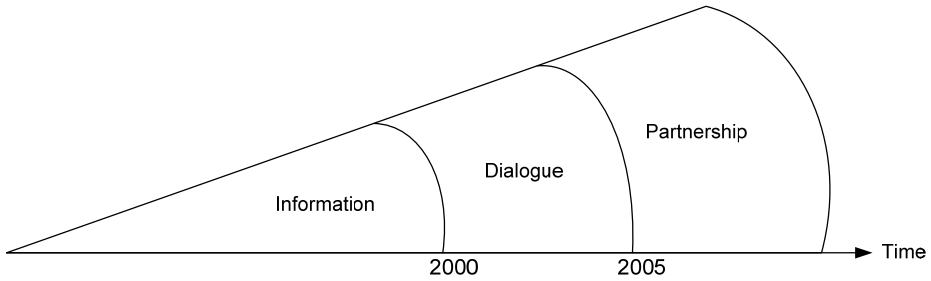

Figure 4 Level of interaction in the environmental communication between the organisation and its stakeholders. The illustration shows the development in concepts, the practices may lack behind.

A narrower definition of environmental communication is applied, as the focus in this thesis is communication between organisations and their stakeholders. The network view is found to be important but the organisation is seen as the centre of the network and focus is on the relation to this centre. This leads to the following definition:

Definition of environmental communication

Environmental communication are the processes that an organisation conducts to engage in collaboration with the network of internal and external stakeholders to encourage the sharing of information, dialogue and establishment of partnerships related to the organisation's environmental and social impacts.

Globalisation is one of the reasons why network interactions become still more important in environmental communication. As product chains become globalised the magnitude of people affected by the operation of the organisation increases, and therefore the number of relevant stakeholders and the need for communication increases as well.

The process of developing ISO 26000 (Standard on social responsibility) is an example of a formalised multi-stakeholder network view. The following stakeholders are included in the process; industrial representatives, governmental agencies, consumer organisations, labour unions, NGOs, researchers and others.

1.2.2 The history of environmental communication

The field of environmental communication is only a few decades old, and is still in rapid development and constantly being reshaped. In the third volume of "Yearbook of environmental communication" published in 2006 Stephen Depoe notes that the year 2006 marks the 10th anniversary of the founding of the Environmental Communication Commission within the National Communication Association. 2006 was also the year of the 15th anniversary of the first Conference on Communication and Environment. (Depoe, 2006)

The Conference of Communication and Environment has been held every second year since 1991 and the field of environmental communication has expanded. Some of the key elements are presented in the table below. It is not a complete list of relevant materials related to environmental communication, but of key elements in an emerging field.

Historic overview of environmental communication initiatives

- 1991: The first conference on Communication and Environment was held in Utah (and since then every second year).
- The environmental communication network was established after the conference in 1991, and over the years, more materials have been added to the web site.
- 1993: The EU Eco-Management and Audit Scheme (EMAS) was published with demands for environmental reporting.
- 1999: The Global Reporting Initiative (GRI) published sustainable reporting guidelines, revised in 2002 and 2007.
- 2004: The first volume of the yearbook of environmental communication was published, second and third volume in 2005 and 2006.
- 2006: ISO 14063 "Environmental management - Environmental communication - Guidelines and examples" was published.
- 2007: The Environmental Communication Yearbook became the new journal: Environmental Communication: A Journal of Nature and Culture. Publishing two volumes in 2007.

(Environmental communication network, 2008) (Routledge, 2008) (GRI, 2008)

Environmental communication has become still more applied in an organisational context in the latest years. The communication relates both organisational values and performance. This is due to increased interest from the general public, stakeholders in the product chain, governments and others. (Environmental communication network, 2008)

In a Danish context, similar changes can be noticed with the Danish EPA as the prime mover. A list of initiatives introduced between 1995 and 2002 follows below.

Examples of environmental communication initiatives in Denmark

- 1995: A Danish law with demands for publishing "Green Accounts" was enacted. (Addressing specific polluting industries)
- 1996: Local authorities have to implement Local Agenda 21 initiatives including dialogue with organisations and citizens.
- 1997: The Danish EPA publishes "Market oriented environmental communication" a handbook for the textile and clothing industry.
- 2000: The Danish EPA publishes a list of handbooks addressing written environmental communication and dialogue with different stakeholders.
- 2001 The law concerning green accounts was modified. (One of the changes was that the green accounts are to be made easy to read and comprehend for non-experts)
- 2002: Regulatory demands for environmental information in public annual accounts.

(The Danish EPA, 2008)

In both international and Danish development in environmental communication the level of interaction has extended from information over collaboration to partnerships. The focus has changed as well; previously the focus in environmental communication was related to environmental issues, today the broader concept of sustainability is included in the concept of environmental communication (a more appropriate term could be sustainable communication). Thereby both economic and social factors are included and linked to environmental factors.

The broadening of the elements included in environmental communication combined with globalisation of the product chains mean that the number of relevant stakeholders increases significantly (ISO 14063). Creation of principles for communication occurs simultaneously with a need for defining concepts that are broadly accepted and understood by different stakeholders. This leads to the development of environmental communication standards. Standards are developed as a means to define concepts and create coherence about the content of environmental communication and the framework for the communication but they also establish a methodology for the communication process. The most well-known and corporately applied standards are ISO 14063 and GRI.
In the following paragraphs the two standards are presented with the purpose of showing the methodology for environmental communication and the principles that are applied. Thereby the potentials and limitations in relation to the environmental communication in organisations are described. ISO 14063 is chosen because it has a broad focus on environmental communication whereas GRI focuses on reporting and goes more into depth with demands for communication. The similarities between the standards are primarily the multi-stakeholder approach and the principles for communicating e.g. transparency.

1.2.3 Global Reporting Initiative

The GRI is a voluntary framework for reporting on sustainable development. It is an independent organisation initiated in 1997 with the aim of creating a reporting standard within the field of sustainable reporting that would replace national or sector-specific guidelines to facilitate comparison between reporting organisations. It includes a “Sustainability Reporting Framework” with “Sustainability Reporting Guidelines” to support organisations in communicating their (sustainability) performance.

One of the complex aspects of using GRI is the sustainability indicators, the so-called performance indicators. There are close to 100 performance indicators to consider within these categories: economic performance, environmental performance, social performance and integrated indicators. The amount and type of indicators show that sustainability has a wide span.

Examples of GRI performance indicators:

- Percentage of recycled input materials.
- Direct energy consumption by primary energy source.
- Description of significant impacts of activities, products, and services on biodiversity in protected areas and areas of high biodiversity value outside protected areas.
- Percentage and total number of significant investment agreements that include human rights clauses or that have undergone human rights screening.
- Life cycle stages in which health and safety impacts of products and services are assessed for improvement, and percentage of significant products and services categories subject to such procedures.

(GRI, 2002)

The principles for reporting are another aspect that makes the communication of sustainability complex. The 11 principles in GRI can be seen as goals towards which a reporter should strive. The first two overall principles are: *transparency* and meaningful disclosure of processes, procedures and assumptions essential to credibility and *inclusiveness* meaning to systematically include stakeholders to help focus and enhance the quality of the report.

The next three principles are related to deciding what information to report: *completeness*, *relevance* and *sustainability context*. Three principles are related to the reliability of the reported information: *accuracy*, *neutrality* and *comparability*. Two principles address how and who to communicate with, namely c*larity* that ensures that the report is accessible and understandable to as many stakeholders as possible and *timeliness* to ensure regular reporting.

One of the advantages of GRI is that organisations secure that stakeholders have a comparable framework that facilitates the understanding of the disclosed information.

The GRI sustainability reporting guidelines address the concept of stakeholders frequently throughout the report both related to the principles and indicators presented above. In the sustainability reporting guidelines it is explained how the guidelines are related to stakeholder dialogue. The primary goal of reporting is to contribute to the ongoing stakeholder dialogue, as reports have little value if they fail to inform the relevant stakeholders and support dialogue that influence the behaviour of both the stakeholders and the reporting organisation. GRI collaborated with Global Compact to facilitate coherence between politics, performance and reporting.

Another initiative related to environmental communication is the development of ISO 14063. GRI is a guideline for reporting whereas ISO 14063 is a guideline for environmental communication.

1.2.4 ISO 14063

A formalisation of the concept of environmental communication is made through the development of a standard. Going from environmental reporting to environmental communication is also an important development as environmental communication is a broader concept than environmental reporting. This can be illustrated by the definition of environmental communication in the ISO 1436 standard:

"*Process that an organisation conducts to provide and obtain information and to engage in dialogue with internal and external interested parties to encourage a shared understanding on environmental issues, aspects and performance*" (ISO 14063)

Environmental communication can be ad hoc or planned, and may require different levels of interaction between the organisation and its stakeholders. The definition seems ambitious as it states that the communication "encourages a shared understanding on environmental issues, aspects and performance". Creating shared understandings calls for a high degree of social interaction in the communication processes especially if the creation of the shared understanding includes taking into account the opinions of all interested parties, and not forcing concepts on each other (giving codes of conduct).

ISO 14063 is an environmental communication guidance standard. It does not prescribe how an organisation should communicate but gives guidance on the issues to be considered when developing an environmental communication program. (ISO 14063) The intention behind the guidance standard is to assist organisations in the process of developing their environmental communication strategy.

In ISO 14063 the development of a communication strategy consists of three phases: finding the objective, identifying interested parties and considering resource issues. After the development of the strategy the environmental communication activities can begin following the model of Plan-Do–Check-Act, which serves as the overall framework just as in the other standards of the ISO 14000 series. Thereby the communication processes is systemised.

The phases in the systemised process:

- Planning scope and target groups: analysing the context for the communication including the existing environmental communication, identifying the interested parties and understanding their interests and setting targets for the environmental communication.
- Selecting approaches and tools: define responsibilities and involvement, tracking input from interested parties and planning for crises and emergencies.
- Performing the communication including collecting and evaluating data, conducting communication activities and record and respond to feedback.
- Evaluating includes reviewing and assessing the effectiveness of the environmental communication.
- Conducting management review. The review should include assessing opportunities for improvement and need for changes in environmental communication.

The principles in ISO 14063 include:

- Transparency: making the processes, procedures, methods, data sources and assumptions available for interested parties.
- Credibility: be honest and fair and provide information which is truthful, accurate, substantive and not misleading
- Appropriateness: making the environmental communication relevant to interested parties and use formats, language and media that meets their interests.
- Responsiveness: respond to the queries and concerns of interested parties.
- Clarity: ensure that approaches and language of the communication are understandable to the interested parties.

(ISO 14063)

The process of identifying the interested parties (stakeholders) should include both those that have already expressed an interest in the organisational activities and those that the organisation wishes to communicate with. This view on stakeholders is broad. The standard also points out that stakeholders may have conflicting interests which leads to an interesting aspect outside the scope of the standard, namely solutions on how to address conflicting interests between the stakeholders.

In the standard a long list of examples of stakeholders is given, and they can be applied as inspiration for identifying the relevant stakeholders of the organisation. However, stakeholders should be prioritised according to how they relate to the specific context of the organisations and not the scope of the standard. (ISO 14063) Neither GRI nor ISO 14063 addresses the concepts of power relations between stakeholders, which is one of the aspects important for this prioritization.

Principles for environmental communication and corporate governance

The principles for environmental communication and the involvement of the stakeholders are known from other areas as well. Corporate governance is one example of this; it is a field in economics, which studies the issues developed through the separation of ownership and control. Corporate governance is a set of processes, policies, laws and institutions affecting the way in which an organisation is administered. Corporate governance also includes the stakeholders involved and the goals for which the organisation is governed. Some of the principles in corporate governance are: rights and equitable treatment of shareholders, integrity and ethical behaviour, disclosure and transparency. (Dignam and Lowry, 2006)

The similarities between corporate governance, and thereby long term economic considerations related to the different stakeholders are closely linked to environmental communication, but the type of stakeholders and the broader scope in environmental communication, focusing on sustainability rather than economics, are some of the main differences.

1.2.5 Perception of environmental communication

As a summary of section 1.2, figure 5 illustrates the development in the perception of environmental communication.

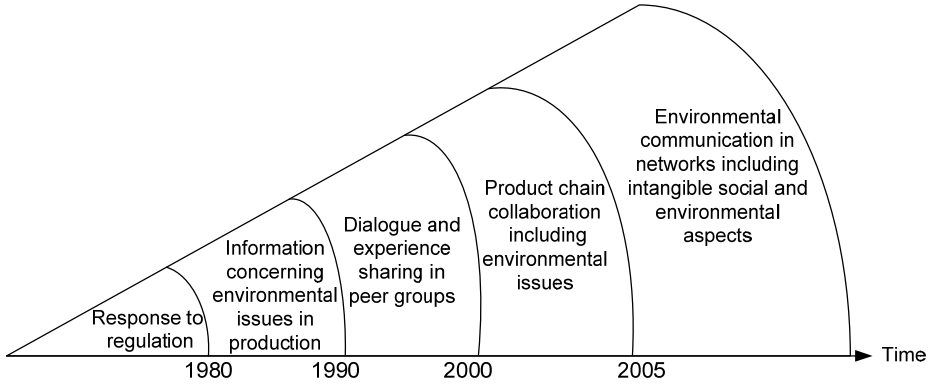

Figure 5. Environmental communication in a historical perspective. The illustration shows the development in concepts, the actual practices in companies may lack behind.

An example of the elements included in figure 5 is in the publication of the GRI guidelines in 1999 that focuses on reporting. ISO 14063 was published in 2006 and has a broader scope, defining environmental communication as a means to encourage the development of shared understanding between an organisation and its stakeholders. Both standards address environmental as well as social aspects.

ISO and GRI apply broad concepts of stakeholders and include those that have shown interest for the communication as well as those that have not shown interest but that the organisation finds to be of relevance anyhow. Both the standard and the reporting guidelines emphasise that the environmental stakeholders are important, as they are the receivers of the environmental communication. In the following section stakeholder theory is briefly introduced and examples of environmental stakeholders are given.

1.3 Stakeholders

The term stakeholder is used frequently in the previous sections. The purpose of this section is to show that the view on stakeholders has developed in recent years, which is important for environmental communication. Therefore this section addresses the target groups for environmental communication and why the organisations communicate with them.

1.3.1 Stakeholder theory at a glance

In the traditional view of organisations, the share- or stockholders are the owners of the organisation, and the organisation puts their needs first (to increase value for them). Stakeholder theory argues that there are other parties involved, e.g. authorities, political groups, trade associations, employees, potential customers, and the public at large.

A stakeholder is any group or individual who can affect or is affected by the organisation. A stakeholder is someone that has something at stake e.g. ownership, rights (legal or moral) or interests. The stakes are related to the past, the present or future corporate activities. The individuals and groups are “holders” if they have legitimate interests in important aspects of the corporate activity. The interests are of essential value for the holder. (Post, Lawrence and Weber, 2002)

There is increasing focus on stakeholder commitment and how this affects the intangible value creation, with potential direct influence on the financial bottom line. The cooperation with stakeholders can lead to for example product innovation, cost efficiency improvements and reputation gains. These aspects will also affect financial factors in the long run. (Kundt and Tuncer, 2006)

The stakeholder view has modified the traditional view of the organisation which focuses on the owners of the organisation and their economic interest. Traditionally, the focus was to convert the inputs of investors, employees, and suppliers into saleable outputs. This input-output approach only deals with the supply chain and addresses the wishes of four parties: investors, employees, suppliers, and customers. Stakeholder theory on the other hand argues that other relevant parties exists as well for example authorities, political groups, trade unions, future employees, future customers, and the general public. (Freeman, 1984)

R. Edward Freeman (1984) was one of the first to address stakeholder theory. He focuses on identification of the groups of stakeholders of an organisation. He both describes and recommends methods for management to pay attention to the interests of those groups. Freeman conceptualized stakeholders as an aggregation of groups or individuals, who affect or are affected by the organisation's activities. (Freeman, 1984)

Later in his work Freeman extends the stakeholder view of the organisation and describes organisations as an aggregation of stakeholders with specific and legitimate interests and intrinsic value (Werhane and Freeman, 1999). This normative base of the theory including the "*identification of moral or philosophical guidelines for the operation and management of the corporation*" is the core of the theory (Donaldson and Preston, 1995).

Stakeholder theory is an instrumental theory of the organisation that integrates the resource-based view and the market-based view and adding a socio-political level. The resource-based view of the organisation is a management school of thought arguing that the ability to compete and the profitability of the organisation come from the resources of the organisation. The market-based view is based on the competitive success of organisations; how they succeed in developing the sales markets and market barriers against potential competitors. The normative view of the organisation is applied to define the specific stakeholders of an organisation as well as examine the conditions under which these parties should be treated as stakeholders. (Donaldson and Preston, 1995) Donaldson and Preston argue that the empirical evidence relating to the instrumental theory is inadequate and that there is a lack of empirical support to the instrumental power of stakeholders. (Donaldson and Preston, 1995)

In his early work, Freeman (1984) presented the interaction between the organisation and its stakeholders as a wheel where the stakeholders are situated at the end of the spokes. Later it has been argued by for example Key (1999) that the stakeholder perspective on organisations is rather a network of interactions. In the network perspective the relationship between the organisation and its stakeholders is no longer a single relationship (stakeholder-organisation). The relationships are more complex and consist of both stakeholder-stakeholder and stakeholder-organisation relationships (Key, 1999).

To sum up, there are three main points in the history of stakeholder theory:

- Focus on shareholders.
- Including all stakeholders with legitimate interests focusing on organisation to stakeholder relationships.
- A network approach including both stakeholder – stakeholder and stakeholder - organisation relationships.

The network approach corresponds with the approach in CSR as it focuses on the relationship between organisation and society. (Key, 1999) Including network aspects in stakeholder theory reduces the differences in the concepts of stakeholder theory and CSR.

1.3.2 Environmental stakeholders

Organisations implement environmental communication because stakeholders show interest in environmental issues or because the organisations find that there are potential future stakeholders to address. Several groups of stakeholders can be relevant for the organisations and their communication about environmental issues including both internal (organisational) and external stakeholders. The arguments for addressing the environmental stakeholders are plenty, for example it reduces the risks of causing environmental hazards, reduces the risk of image problems due to negative publicity in the media and facilitates a reduction of the impacts both economically, socially and environmentally associated with the operation of the organisation. The stakeholders also have conflicting interests. An example is that shareholders focus on profit whereas the local authorities focus on reduction of environmental and social impacts. Organisations need to find strategies to address these conflicting interests both in communicating with the stakeholders but also in prioritising environmental and social initiatives in the organisation and its operations.

Figure 6 illustrates the different categories of stakeholders related to the organisation and its environmental affairs. The lines illustrate the possible communication channels between the organisation and its stakeholders. It is seldom relevant for an organisation to address all stakeholders, and it is also costly, therefore it is necessary to prioritise.

The stakeholders are split into two main categories namely the market stakeholders and the non-market stakeholders. The market stakeholders are associated with the product chain. The market stakeholders are those who engage in economic transactions with the organisation and its purpose of providing society with goods and services. (Post, Lawrence and Weber, 2002) In figure 6 the market stakeholders are represented by four groups: the supply chain, the organisational (internal) stakeholders, the customer chain and the investors.

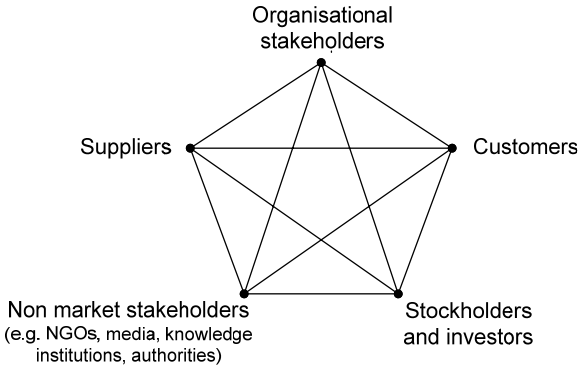

Figure 6 The stakeholders of the organisation. The nodes represent several stakeholders. The lines illustrate environmental communication processes.

The non-market stakeholders are people or groups who do not engage in direct economic transactions with the organisation but none the less are affected by or can affect its practices. Examples of non-market stakeholders are: local communities, the general public, authorities, the media, NGOs and organisations.

1.3.3 Market stakeholders

Table 1 shows the interests of the market stakeholders and their means for addressing them.

	Interests	Means for addressing interests
Suppliers	▪ Receive orders for goods ▪ Be paid for the delivered supplies	▪ Refusing to meet orders ▪ Supplying to competitors
Organisational stakeholders	▪ Maintain stable employment ▪ Receive fair wage ▪ Safe working environment	▪ Union bargaining power ▪ Work actions or strikes ▪ Publicity
Customers	▪ Receive safe, reliable products ▪ Get quality for the money spent	▪ Choosing competitors ▪ Boycotting organisations
Retailers	▪ Get quality goods in due time and at reasonable cost ▪ Offer reliable products	▪ Buying from other suppliers ▪ Boycotting organisations
Stockholders	▪ Receive return on investments	▪ Exercising voting rights ▪ Exercising rights to inspect books and records
Investors	▪ Receive repayment of loans ▪ Collect debts and interest	▪ Calling in loans ▪ Utilizing legal authorities to repossess or take over property

Table 1: Market stakeholders and examples of their interests and means for addressing the interests. (Inspired by Post, Lawrence and Weber, 2002)

In the following some examples are given of how market stakeholders can express their environmental interests and act on them.

Suppliers collaborate with their customers about e.g. development of products with less environmental impact. This can contribute to gaining positive long-lasting relations between the supplier and the organisation (Andersen and Mosgaard, 2002).

The organisational stakeholders are of relevance as conflicts can arise when different departments in an organisation have different interests and are involved in planning and implementation of environmental communication. If the purchasing and sales departments do not perceive environmental issues as important it might be difficult to implement e.g. green procurement or green marketing.

Because of development in the media coverage and the globalisation in general the *customers* have easy access to information about organisations and their operations. Therefore customers are able to identify and respond to environmental issues in the organisation's supply chain to a much greater extent than they have in the past.

When organisations communicate with customers, rating organisations and authorities they hope to gain some advantage related to competitors, by showing how they are reducing their environmental impact. Two approaches to communication with the consumers are:

- To market the product as representing a niche in the product group with reduced environmental impacts.
- To have specific environmental characteristics that is seen as a duty characteristic for the product type.

In other words, the organisations try to match their own values with the values of the customer. Another perspective is that the organisations create trust and common awareness of environmental issues in the product chain by communicating and establishing value based collaboration. (ISO 14063)

The stakeholder groups have different interests and means for influencing the organisation's environmental performance. The organisation is able to communicate relevant environmental issues to the stakeholders and collaborate with them to improve the environmental performance of the organisation.

1.3.4 Non-market stakeholders

Table 2 shows the interests of the non market stakeholders and their means for addressing them.

	Interests	Means for addressing interests
Communities	▪ Employ local residents ▪ Protect local environment ▪ Development of the local area	▪ Refusing additional credit ▪ Restricting operating licenses and permits ▪ Lobbying government
NGOs	▪ Monitor practices and policies to ensure that the organisation conforms to certain sustainability standards.	▪ Gaining broad public support ▪ Lobbying government for regulation of the organisation
Media	▪ Keep the public informed on sustainability issues ▪ Monitor organisational practices	▪ Publicising events that affect the public (The popular story)
Knowledge institutions	▪ Provide research and information	▪ Using resources to assist in organisation development
Governments	▪ Promote economic development ▪ Encourage social improvements ▪ Raise revenues through taxes	▪ Adopting regulations and laws ▪ Issuing licenses and permits
The General Public	▪ Protect social values ▪ Minimise risks	▪ Pressing government to act ▪ Criticise or support individual organisations

Table 2 Non-market stakeholders and their interests and means for addressing the interests. (Inspired by Post, Lawrence and Weber, 2002)

In the following some examples of non market environmental stakeholders and their interests are given.

The NGOs are active in the field of corporate environmental efforts and play an important role in the supply chain considerations as they gain local experience in the place they operate and apply this experience in the evaluation of organisational policies and practices. For example, when news about the use of child labour or problematic health and safety issues in the supply chains appear in the European media it is often local NGOs that have identified the problems.

The media is a communication line for other stakeholders, especially the non-market stakeholders like authorities and NGOs. The environmental issues they address are related to the interest of the other stakeholders and the general public. They also have the potential to inform about environmental achievements in organisations e.g. when they are awarded for their environmental reports or develop new technologies with reduced environmental impact.

An example of the media as an important stakeholder is given below. The example is from one of the CEMIP organisations (CEMIP is an innovation consortium introduced in section 2.2. See annex II for an introduction to the companies).

The authorities are interested in protecting the local environment and the health and safety of the local residents. They can influence the organisation through the regulation of emissions, waste, wastewater and operating conditions.

Example: Junckers and illegal foresting

An environmental organisation criticised several producers of wooden floors, including Junckers, because they were using merbau from Indonesia in their production. The merbau was claimed to be illegally forested. The environmental organisation contacted the Danish media and the story was in the evening news.

Junckers immediately visited their supplier in Malaysia to investigate the claims. Junckers made a checklist of the environmental demands that they normally have for their suppliers and added the elements that the environmental organisation had examined. The checklist was sent to the supplier in advance so that he could prepare for the audit. One of the problems related to merbau is that it comes from numerous sub-suppliers and it is difficult to manage a control of them all.

After the site visit the relevant stakeholders, namely environmental NGOs, local authorities and sub-suppliers participated in a meeting to discuss how to handle these issues in the future. The information from the audit and the meeting were collected in an audit report.

A new meeting with all relevant organisations was held and the output from this meeting was an action plan to secure the documentation for the legality of the wood. All the interested parties agreed upon the action plan.

(Inspired by Schmidt, Mosgaard et al., 2007)

In the example above Junckers reacted in order to minimize the negative publicity (in the media). Junckers chose to include both market and non-market stakeholders in the process to facilitate a result acceptable to all relevant stakeholders, thereby reducing the risk for future problems.

1.3.5 Development of stakeholder approach in environmental communication

The intangible aspects in environmental communication can influence the organisations performance in the long run; the intangible aspects are for example brand reputation, competitive advantages and trust in the product chain relationships. It can be difficult for organisations both to identify their sustainability priorities prior to engaging with stakeholders and to address the stakeholders with the right communication tools.

The market stakeholders have primary interest in the monetary, product and information flows essential for running an organisation and producing products and services. (Post, Lawrence and Weber, 2002). The information flow includes elements that are disassociated with the environmental interests of the specific stakeholders, i.e. information necessary for producing products and services.

Communication about environmental affairs is also a way of reaching the expectations of powerful stakeholders. GRI and ISO 14063 do not address the concepts of power relations in the product chain and related to other stakeholders, which are central elements in stakeholder theory. This is not a part of the scope of the standards. The stakeholders may have conflicting interests which have to be considered in the development of communication strategies.

As the perception of environmental issues have developed over time (Figure 2, page 4) the number of stakeholders and types of stakeholder relations have changed as well, this is illustrated in figure 7.

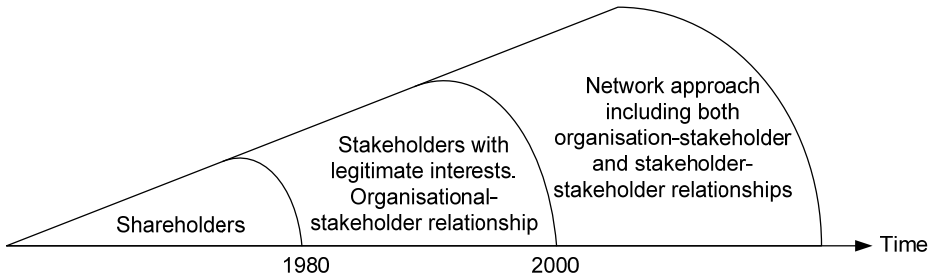

Figure 7 The development in stakeholders for environmental communication and the type of interaction with the stakeholders. The illustration shows the development in concepts, the practice may lack behind.

In the historical development of environmental stakeholders, the types of stakeholders to address have broadened from stockholders to environmental and social stakeholders and the types of interaction have gone from organisation – stakeholder interaction to a network approach addressing stakeholder-stakeholder interactions and the coalitions the stakeholders are likely to form. The types of aspects that are addressed have also changed from measurable environmental impacts to more intangible aspects.

1.4 Environmental communication; who, what, how and why

Through the chapter the following dimensions related to environmental communication in organisations have been outlined:

- How the perception of environmental problems has developed over time, related to environmental communication. This illustrated **what** organisations are communicating about, from a narrow approach focusing on local environmental impacts to a broader focus on global environmental and social aspects.
- The next step was to identify **how** companies communicate, going from information on specific local emissions to developing partnerships in the product chain and collaborating about both social and environmental issues. To cope with this challenge, standards prescribing principles for communicating (codes of conduct) have been developed (GRI and ISO 14063) and a variety of sustainability indicators to comply with have been developed in order to systemise the communication (GRI)
- The development in **how** the organisations communicate has also changed in the sense that instead of describing input-output aspects, as is the case with the green accounts, they now focus on the actual developments and improvements that have been made.
- The development in environmental perception has also changed **what** the organisations include in the communication and who they address going from information on local environmental impacts aimed at the regulating authorities to addressing global stakeholder networks relating both environmental and social impacts.
- The final step was to elaborate on **who** the environmental stakeholders are and why the organisations communicate with them. This development has gone from shareholders with primarily economic considerations to networks of stakeholders with both legitimate environmental and social interests.

In figure 8 is illustrated the dimensions listed above. Going from the centre of the circle to the circumference illustrates the historical development.

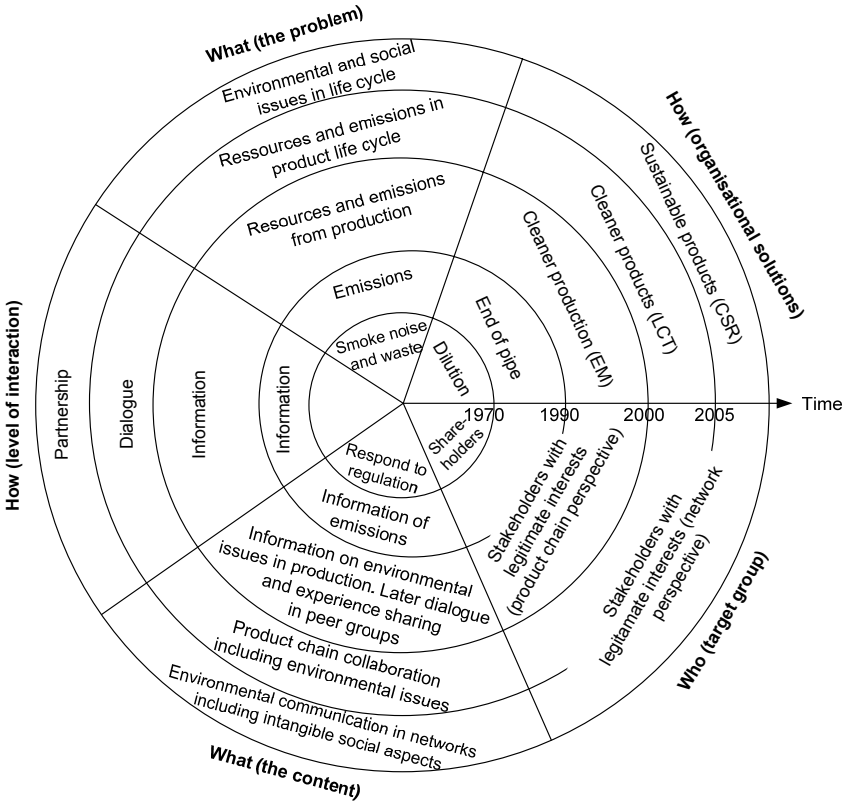

Figure 8. Historical development in concepts relating to environmental communication. The illustration shows the development in concept; the practice may lack behind and vary from organisation to organisation.

Figure 8 shows that a historical development where the complexity of environmental communication increases related to the elements presented in this chapter.

The findings in this chapter lead to the following considerations:

- It is necessary to develop strategies for and systemise the process of environmental communication to reduce the complexity as there are numerous potential stakeholders to consider and sustainability indicators to address. Therefore it is also necessary to determine the level of ambition for the organisational communication as a part of the strategy (Strategic level).
- There is a need for communication tools that can be applied in each specific case of environmental communication suitable for the specific purpose and target group. (Operational level)

This chapter relates to the strategic level of environmental communication in the next section the focus changes to the operational level of environmental communication namely the tools for environmental communication, focusing on how the diversity in stakeholders and interests lead to the development of different environmental tools with different purposes.

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2 CEMIP and tools for environmental communication

The first purpose of this chapter is presenting some of the communication tools that organisations apply, in order to address their different environmental stakeholders. The tools are categorised according to the level of interaction that they require and the target group.

The second purpose is to introduce results of the work in CEMIP. CEMIP (a Danish abbreviation for "Centre for Effective Environmental Communication in Product Chains") is a Danish innovation consortium that has worked with the communication with stakeholders in a case-oriented approach. This thesis is a part of the CEMIP work.

2.1 Tools for environmental communication

Communication tools are often applied in the environmental communication between organisations and their stakeholders. The tools make the environmental communication operational as they address specific stakeholders and their specific interests (see section 1.2). The tools have different purposes, require different levels of interaction and have different target groups as illustrated in figure 9.

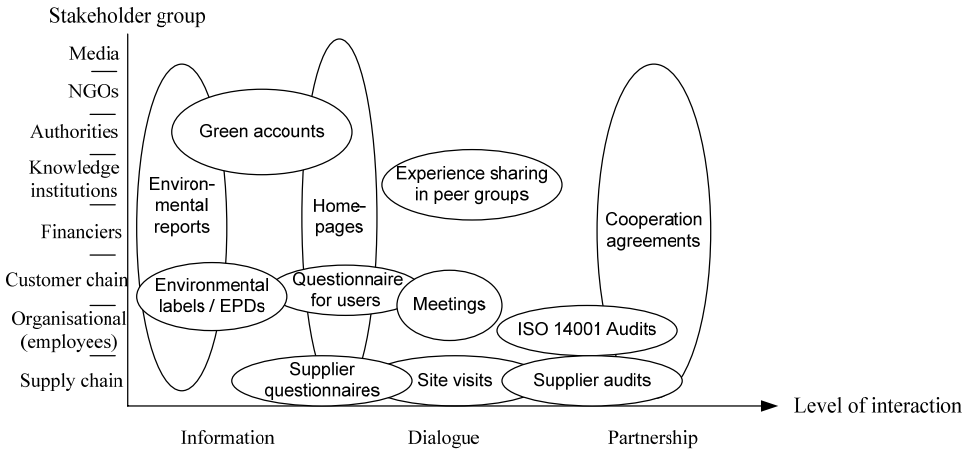

Figure 9 Different organisational communication tools related to the stakeholders and the level of interaction in the communication processes. The figure is based on the stakeholders presented in section 1.3.

Some communication tools mainly have the purpose of informing the stakeholders about environmental impacts and initiatives in the organisation, this goes especially for environmental reports, green accounts and environmental labels. The Global Reporting Initiative (GRI) focuses, as the name implies, on reporting and thereby information tools. Organisations make environmental reports with different purposes; some because they are obliged to if they have an EMAS registration and some in order to meet the expectations of the stakeholders. Green accounts are, in a Danish context, mainly made in order to comply with regulatory demands.

The dialogue based communication tools related to the suppliers are applied in order to secure liability in environmental information in the product chain. The organisation makes site visits at the suppliers, if they find it necessary, and asks the suppliers for environmental information either related to the products they buy or to the environmental policies of the suppliers.

In ISO 14063 the definition of environmental communication includes development of shared understanding. The level of interaction that facilitates this is somewhere in-between dialogue and partnerships and can be accomplished through, for example, audits and ongoing collaboration. It is primarily a question of developing a code of conduct, if the development of shared understanding is based on the organisation telling its stakeholders how to understand the communication. Another tool that is based on dialogue is sharing experiences in peer groups, this can also lead to shared understanding and even development of new ideas. CEMIP is an example of applying the latter approach.

Less environmental communication tools are available for the creation of partnerships. Supplier audits that, if necessary, are followed with action plans to improve the environmental performance call for collaboration but not necessarily partnership. In eco-design processes, where technologies are developed and partnerships established, cooperation agreements are one of the possible tools.

Both ISO14063 and GRI focuses on principles for communication and systems for developing and implementing communication strategies. Only to a limited degree do they discuss the implementation of different communication tools related to the goals for communication. These aspects are not included in the scope of the standards but are none the less important for the environmental communication strategies, to lead to changes in the practices of the organisations.

After identifying an appropriate tool and determining to put it to use in an organisational context the implementation and including the relevant departments in the environmental communication processes become important. The implementation of the tool demands action from the organisational (internal) stakeholders as it is context dependent.

GRI and ISO are developed as general standards. Therefore the context dependent implementation issues are not included but have to be addressed by the individual organisation.

It is essential that environmental communication is efficient; that it actually leads to changes in the practices and thereby reduces the environmental impacts from the products.

The three aspects of selecting and developing communication tools, implementing them in an organisational context and making sure that the tools are efficient are some of the key elements in the work done by CEMIP; this thesis is one of the contributions.

2.2 CEMIP

CEMIP (Danish abbreviation for "Centre for Effective Environmental Communication in Product Chains") is an innovation consortium that, through collaboration, have developed and gained experience about environmental communication tools. CEMIP is partly financed by the Danish Agency for Science, Technology and Innovation and partly financed by the organisations involved.

The organisations that participated in CEMIP are: The Hartmann group, Coloplast, Elsam (now DONG energy), Junckers Industries and Vestas Wind Systems. Other participants included Aalborg University, Copenhagen Business School and FORCE Technology (project manager). The operational level of the collaboration is a working group that consists of members of all the organisations in CEMIP.

The working group in CEMIP gathers every 2-3 month in order to discuss different communication tools, develop new ones and exchange experience with environmental communication. Between the meetings the organisations work on developing testing and implementing the communication tools.

The keyword for CEMIP is "how". CEMIP focuses on how to develop and implement environmental communication tools and this leads to the development of a number of tools and examples for the appliance of the tools. Besides this recommendations are made and background knowledge relating to environmental communication processes in organisations is gained. A Danish introduction to CEMIP can be found at www.CEMIP.dk.

The purpose of CEMIP was originally stated as:

> To exploit the business potential in environmentally sound products implemented through improved and targeted communication in the product chains, with specific focus on market oriented communication and dialogue with suppliers.

The purpose focuses on the supply chain and specifically on the market oriented communication and the dialogue with suppliers.

In CEMIP the following illustration was developed to show the focus areas:

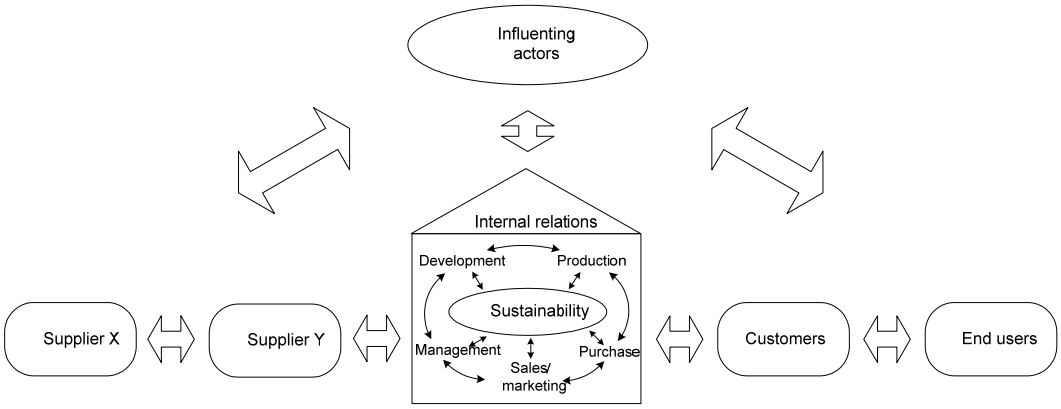

Figure 10 Stakeholders and their interactions with the organisation. An illustration applied in the CEMIP work. (Schmidt, Mosgaard et al., 2007)

The stakeholder approach applied in CEMIP is primarily dealing with organisation to stakeholder interactions and to a less degree stakeholder-stakeholder interactions (the network interactions).

2.2.1 The CEMIP organisations

This section describes the organisations in CEMIP, their status in environmental work, their wishes for the CEMIP project, and the results of the project. Firstly a presentation of the organisational expectation for the CEMIP project is given and afterwards the main results of the CEMIP project are presented.

In the CEMIP project the participating organisations invested a half to one full man-year in the project. This lead to a selection of organisations that were proactive within the environmental field, as they had sufficient resources to participate. This also secured that the organisations had a proactive approach to environmental work and specifically environmental communication.

As stated earlier Coloplast, Vestas Wind Systems, Elsam, Junckers and the Hartmann group are the organisations included in the project. In a Danish context these organisations are large both in relation to the number of employees and their turnover. See Appendix I for an introduction to the companies.

The five organisations are certified according to ISO 14001 and OHSAS 18001. Besides the traditional work with environmental management systems they have also addressed the stakeholders in the product chain. Especially Hartmann, Coloplast and Vestas have focused on environmental communication related to the consumers. All five organisations make environmental assessments of their suppliers but employ different approaches ranging from simple questionnaires to supplier audits. Both Hartmann and Coloplast had joined Global Compact before the CEMIP project started up, and therefore they have an interest in securing that the focus in CEMIP is on sustainability rather than a narrow environmental focus.

Communication with suppliers is the area that has most focus in CEMIP. This is due to several factors. First of all the organisations are interested in risk minimisation related to the suppliers and therefore find use of this focus area from the beginning. Secondly the organisations need information from the suppliers in order to fulfil their own environmental policies, as environmental demands for suppliers are a part of the demands for the ISO 14001 certification. Thirdly they need data from the suppliers to develop life cycle assessments. Finally control with suppliers and setting demands is a tool for identifying unnecessary environmental impacts in the product chain, also including those related to social impacts and thereby the more intangible factors. The latter approach is especially important for the organisations in order to secure that they comply with the principles in Global Compact but also to minimise the risk of getting a negative image in the general public through negative stories in the media.

2.2.2 The organisations' expectations of CEMIP

In the beginning of the CEMIP project interviews with the participating organisations are conducted individually. The interviews have the purpose of identifying the wishes and expectations from the organisations related to the project. The table below shows the expectations and wishes to the work in CEMIP. The table illustrates important challenges for environmental communication in proactive organisations.

	Internally in CEMIP	Communication with suppliers	Communication with customers	Communication with other stakeholders
Junckers	▪ Exchange experiences. ▪ Get and give inspiration.	▪ Motivating sharing of data. ▪ Promote FSC and PEFC. (Environmental labels on wood)	▪ Product oriented marketing. ▪ Match information to customer groups.	▪ Dialog with those that develop checklists for construction of buildings.
Hartmann	▪ Exchange experiences.	▪ Tools that include sustainability issues based on dialogue.	▪ Develop the existing tools.	▪ Communication with investors (rating organisations, investors).
Coloplast	▪ Exchange experiences.	▪ Tools that include both environmental and sustainability issues.	▪ Tools for sales department. (And internal implementation)	▪ Demonstrate value creation from environmental communication.
Elsam	▪ Exchange experiences (Focus: homepages).	▪ Tools for supplier evaluation including how to secure data quality.	▪ Not specified	▪ Communication with stakeholders. ▪ Secure internal under-standing of sustainability.
Vestas	▪ Exchange experiences.	▪ Motivating collaboration ▪ Environmental and health and safety audits.	▪ Develop environmental product declarations.	▪ Active use of ”positive stories” ▪ Renewing environmental reports.

Table 3 Expectations for CEMIP. Based on Schmidt, Mosgaard et al. (2007)

The communication in product chains is of importance for most of the organisations and is an area they want to develop further. Some of them also pointed out that the internal communication processes were important to address, but this was not prioritised in the beginning of the project.

In the next section some of the communication tools that have been developed and/or tested through the CEMIP collaboration are presented. They illustrate how the agenda for the work in CEMIP were modified through the project.

2.2.3 Results of the CEMIP project

More than 20 tools for environmental communication and a number of examples of the appliance of the tools are developed in the CEMIP working group. Some are applied in the environmental communication in several organisations; some are only tested in one organisation. In this section some of the tools are presented. (At the enclosed CD is the “CEMIP handbook” introducing the tools developed –The handbook is in Danish)

CEMIP focuses on communication tools that organisations develop and implement and not the tools that they respond to (as suppliers). Therefore supplier evaluations are only included as something the organisations send to their suppliers and not something they receive from their customers. This distinction has been made to secure that the tools in play are those the organisations are actually in control of. However; the work in CEMIP is definitely inspired by tools from other organisations and stakeholders such as questionnaires and homepages from other organisations and publications from the Danish EPA.

An illustration of some of the main environmental communication tools in CEMIP is given in figure 11, reflecting the different levels of interaction and stakeholder groups.

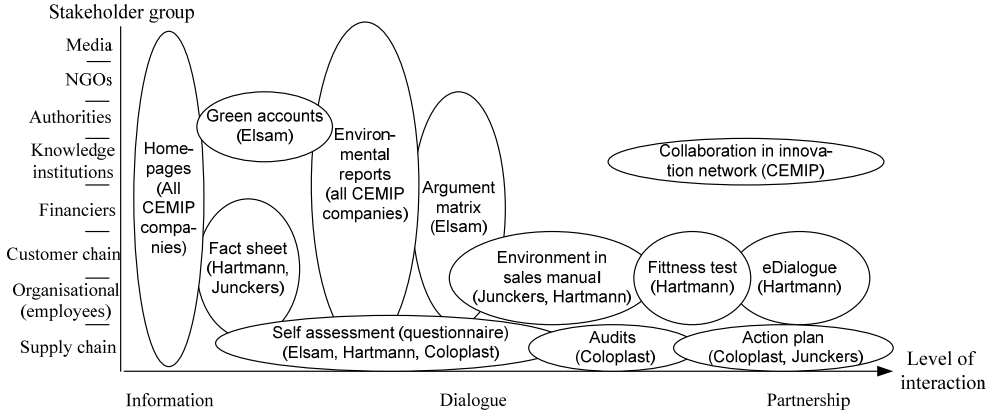

Figure 11: Communication tools developed and/or tested in the CEMIP project. The level of interaction and stakeholders involved illustrates the actual implementation, even though there are possibilities for a broader application of the tools.

As illustrated with the tools above, the main focus in CEMIP is environmental communication in the product chain and this follows the expectations of the organisations presented in section 2.2.2.

Homepages are one of the information tools that are addressed in CEMIP. It is striking that organisations often put their environmental reports on the homepage without taking advantage of the possibilities for streamlining the information in relation to the relevant stakeholders. Another information tool that is applied is the green accounts. The experience is that generally the number of stakeholders is limited and they do not respond directly to the information. Therefore the green accounts have been simplified so that they are focused on compliance with the regulative demands.

In CEMIP a STEP-wise approach to stakeholder dialogue was developed, where the suppliers are categorised according to the risk associated with them (Se Appendix II). For the suppliers assessed to have a high risk site visits are made. Potentially this can lead to actual audits and action plans for improvements. The assessment of risk of the suppliers is based on several parameters; the geographical location of the supplier and the history of risks in that region, the size of the supplier (measured in amounts of goods purchased from them) and the experiences with the supplier.

There are differences in the frequency of the appliance of the questionnaire. Some organisations only make one assessment of the supplier and thereafter they use the supplier freely in the purchasing processes. Some evaluate their suppliers on a regular basis to identify whether they are improving their environmental performance. Finally some organisations make environmental assessments of each new product they decide to purchase.

An area that gains attention in CEMIP is communication with customers. The point of departure is to identify how the environmental department can support sales and marketing in incorporating environmental issues in their external communication with customers. The focus is creating environmental arguments and facts with a customer related approach. Fitness tests that clarify the similarities and differences between the organisational policies and practices and the customers' policies and practices is one of the tools applied. Another tool that focuses on the creation of shared understanding is e-dialogue. The purpose of the tool is to show that it is feasible in a life cycle perspective to choose the products from Hartmann compared to plastic packaging. It also calculates the taxes on the different packaging. For further description of the tools see Schmidt, Mosgaard et al (2007).

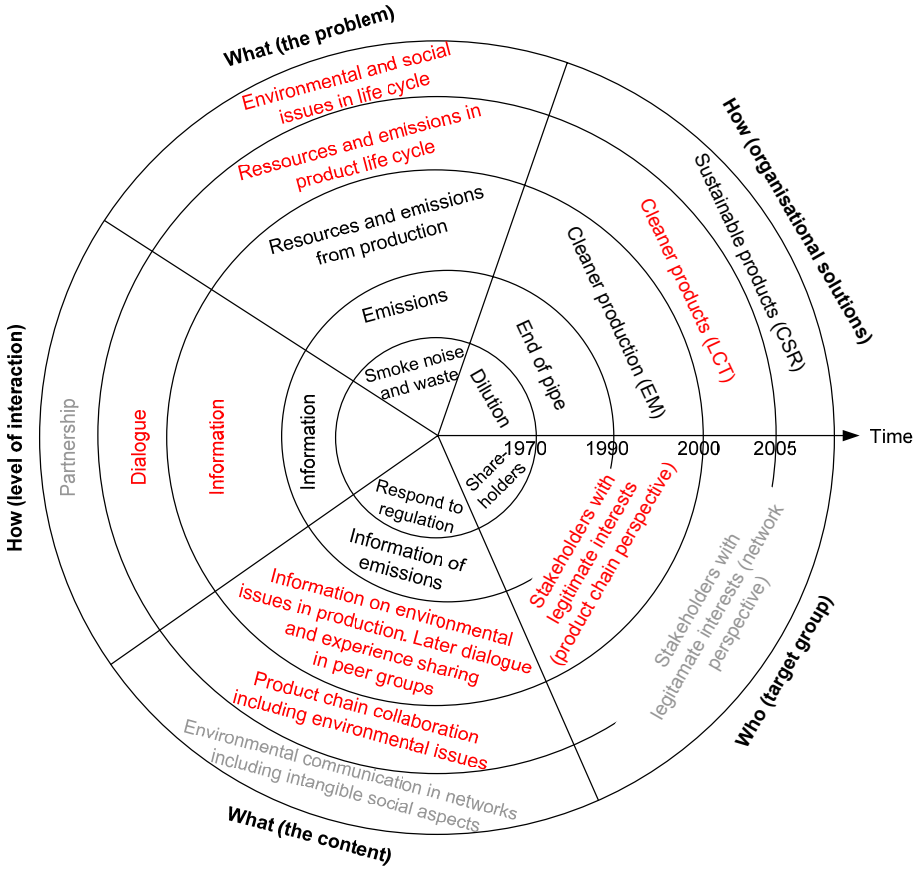

Figure 12 The approach to environmental communication in CEMIP. The elements written in red are the focus areas in CEMIP and the grey are those not included.

In CEMIP the perception of environmental issues includes both social and environmental aspects and has its basis in CSR. None the less the development was limited to dialogue based tools, with a modest focus on partnerships. Likewise the network aspects of stakeholder interactions are not addressed. This shows how the concepts and the perception of environmental issues are more proactive than the tools developed; the practices lack behind the concepts applied.

The way the organisations handle the environmental communication in the supply chain differs significantly, but the internal implementation has been especially important for the results of applying the tools. This is discussed in the following section.

2.2.4 Implementation of communication tools

During the project demand for addressing the implementation of the communication tools increases as developing the tools does not lead to environmental improvements by themselves. The implementation of the tools, and thereby the social acceptance of the tools in the organisation is also important.

Together with the development of the external communication tools follows a process of internal communication in the organisation. The content of the tools should suit the practices in the departments where they are applied. Therefore collaboration with the internal stakeholders is important. During the work in CEMIP the importance of the internal collaboration became still more apparent, but the main focus was still the development of tools.

Some initiatives were applied in order to identify and influence the motivation and attitudes towards environmental issues in the organisations and to secure the implementation of the communication tools. There were three main categories of initiatives:

- Analysis that examines the motivations for and attitudes towards environmental issues.
- Workshops that show the employees the importance of environmental issues.
- Training in applying the communication tools in the working practice.

2.3 From tool to implementation

In the operational level of environmental communication a variety of communication tools are available. Among other factors the appropriate tool is selected based on the intended level of interaction associated with the communication and the stakeholders that are the intended target groups.

Through the work in CEMIP a number of different tools have been developed and tested. In CEMIP the environmental communication with suppliers is the issue that gained most focus. This is both due to the fact, that most of the CEMIP organisations work with this, but also that there is differences in the applied tools. All the CEMIP organisations experienced difficulties in the implementation of the tool in the purchasing departments.

CEMIP only to a limited degree addresses the issues of implementing the tools in an organisational context. However it was repeatedly discussed that the implementation often is difficult and dependent on the different cultures and practices in the departments.

This leaves an open aspect. It has been recognised through CEMIP that the implementation of the tools are important, but it has not been the core focus of the work in CEMIP.

Therefore it is found to be important to deal with the organisational implementation of an environmental communication tool in this thesis, namely green procurement, and develop a theoretical framework that can be applied in understanding the cultural aspects in the organisation and how they affect the implementation processes.

A tool may be general and applicable in several organisations but the implementation of the tool is individual, which is at least what is taken for granted in the work in CEMIP. Maybe there are some common aspects / understandings that can be shared with others? In order to identify this, it is necessary to go into detail with the preconditions for the implementation of the tools, and that is what is dealt with in the following chapters.

References for chapter 2

Schmidt, Mosgaard et al (2007): CEMIP håndbogen; The CEMIP handbook with a presentation of the tools that are developed and tested in the CEMIP group. 2007. Published at www.cemip.dk.

3 Research question

Environmental communication in organisations has changed over time. Previously, it was mainly information on local environmental impacts aimed at neighbours and local authorities. Today, environmental communication addresses international stakeholders and includes both environmental and social impacts. Thereby organisations have changed what stakeholders they address as well as what they communicate to them. Choices therefore need to be made related to how organisations cope with environmental communication: What stakeholders should be addressed? What communication tools should be applied? The selection of communication tools depends on, for example, the intended level of interaction and the environmental issues addressed.

A number of tools for communication in product chains were developed and tested in the CEMIP project. CEMIP only addressed the issues of implementing the tools in an organisational context to a limited degree. However it was repeatedly discussed in the CEMIP group that implementation is often difficult and depends on the different cultures and practices in the departments.

During the implementation of communication tools for supplier evaluation in the CEMIP companies, the following questions were raised by the environmental coordinators: What are the conditions that lead to differences in the implementation process? Are the policies, procedures and work instructions clear and understandable? Are the communication lines clear? Do the employees know how to apply the tool? Do the purchasers value green procurement? Is there a social acceptance of the environmental issues? Does the green procurement lead to any real changes in the practices of the suppliers?

In this thesis, the implementation of green procurement in an organisation is analysed. The definition of green procurement follows the definition made by the European environmental agency:

"*Taking environmental aspects into consideration in public and institutional procurement*." (European Environmental Agency, 1998)

In regard to this definition two specifications are made; the aspects addressed include both environmental and social impacts, and the considerations in public and institutional procurement includes all levels of communication from information to establishment of partnerships.

As the analysis focuses on the internal implementation of green procurement only the internal stakeholders are included. This delimitation calls for organisational theory whereas a focus on external stakeholders could be addressed by using stakeholder theory.

Some of the companies in the CEMIP project faced challenges in applying tools for green procurement in the purchasing department, but this was not the main area of interests as the focus was the development of tools. Elsam, as a specific case, faced various challenges in the implementation of green procurement in different departments of the organisation.

The considerations above lead to the research question that forms the basis for the analyses:

Research Question

How is implementation of green procurement influenced and facilitated by organisational subcultures?

The research question is answered by addressing following sub issues:

1. How can organisational subcultures in green procurement be understood?
2. What are the similarities and differences in subcultures and in green procurement practices in Elsam?
3. How do organisational subcultures influence green procurement in Elsam?
4. How can environmental practices facilitate the implementation of green procurement in Elsam?

A theoretical framework is developed in chapter 5 that addresses the first sub issue. The case analysis in chapter 8-12 shows the similarities and differences in subcultures related to green procurement in Elsam; thereby they address the second sub issue. A synthesis of the results from the case analysis and recommendations for changes in Elsam in chapter 13 addresses both sub issue 3 and 4.

References for chapter 3

European Environmental Agency (1998) Life Cycle Assessment (LCA) - A guide to approaches, experiences and information sources. ISBN: 92-9167-079-0 available at http://reports.eea.europa.eu/GH-07-97-595-EN-C/en accessed 10th of November, 2008.

4 Method

Research can be defined as "Production of new knowledge through a methodological consciousness approach" (Kvale, 1997). In order to reach trustworthy results the methods have to fit the research questions.

In section 4.1.3 it is argued that qualitative methods are chosen for the case study. Many research methods and techniques are available within the field of qualitative research, and the task is to make them appropriate for the concrete research design (Lincoln and Denzin, 2000). In the research process a number of methodical choices are made. They are presented in this chapter in order to communicate the quality and credibility of the method, specifically in relation to the case study design.

4.1 Design of study

The purpose of this section is to present the design of the study related to selection of case, actors included in the study, data collection methods and design of the interview guides.

The thesis is a case study of the Danish energy producer Elsam. Ideally the entire research process should be considered before starting the casework and interview process, as the choices of theory and methods determine the analyses that can be made. The process has not been chronological, as some of the theoretical considerations were not investigated from the beginning. The interaction process between empirical and theoretical considerations is described in figure 13.

The theory relating to organisational reality was included in the development of the interview guide. As the process of data analysis was progressing, it was realised that a supplementary theoretical approach, namely including boundary interactions between subcultures especially with focus on brokering, could be beneficial for the analysis as it introduces a more process oriented view to understand the development of practices in the organisation. This is presented in chapter 5.

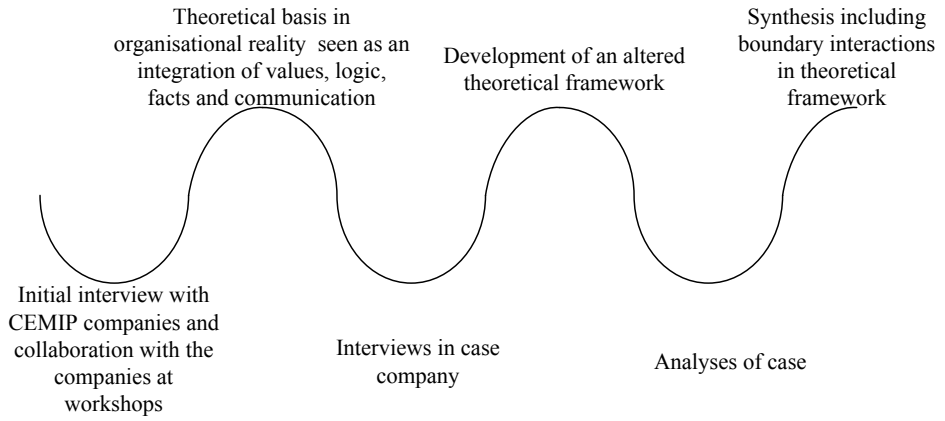

Figure 13 The interaction process between empirical and theoretical considerations.

This thesis has a primarily inductive approach taking an empirical point of departure, whereas the theoretical framework mainly has been designed and applied as an interpretation tool. The methodology described in this chapter shows how the empirical data is collected and how the data is analysed.

4.1.1 Selection of case

As a part of the initiation of the innovation consortium, CEMIP, open interviews were conducted with the contact persons from the five companies included in the consortium. These interviews were intended to identify their wishes to the consortium. The interviews formed the basis for the collaboration with Elsam; they were interested in collaboration concerning environmental supplier evaluations.

In this respect there was no strategic selection between huge numbers of possible case companies for the study but the case almost chose itself, having in mind that the collaboration would not have continued if I hadn't found the case interesting. The case has some characteristics that are influential for the type of conclusions that can be drawn from the results of the case study.

First of all this is not a random selection but an information-oriented selection. Flyvbjerg (2001) describes the purpose of this type of case selection, as a way to maximise the utility of a single case. The case is selected because of expectations about their information content related to environmental communication and especially communication in the supply chain.

4.1.2 Criteria for selection of case organisation

Based on the findings in the work in CEMIP I had a wish to focus on implementation of environmental communication strategies and tools and the following interaction between the different departments in an organisation. Therefore an organisation that works with environmental communication in product chains is preferable, but also an organisation that experienced some problems in the implementation of the environmental communication tools, as this could lead to interesting investigations of the challenges they face.

- In order to get easy access to the organisation it is preferable that the organisation is motivated for the collaboration.
- The organisation should be interested in an investigation of the implementation of environmental communication tools and strategies.

Elsam fits these criteria and is therefore chosen as the case. Elsam is introduced in chapter 5. An interesting aspect about this case is that it actually consists of a lot of different cases in one, facing some of the same challenges. The organisation has some overall policies and procedures that both central and local power plants should comply with. There are interplay between "the environmental experts" and the purchasers at several levels. The most dominant interplays in the internal communication process relating to supplier evaluations are:

- The project purchasers and the central environmental department
- The "central purchasers" and the central environmental department
- The local purchasers and the local environmental coordinators.

Choosing an organisation where the policies, procedures and tools are similar for all departments makes it possible to consider how the differences in subcultures influence the actual implementation process. Examples of elements that are similar for the different purchasing departments are: The environmental policies, the environmental procedures and the questionnaires for the suppliers, the organisational management systems and the education of the purchasers.

To initiate the collaboration with the organisation several meetings were held with people from the central environmental department (EKM). EKM are responsible for the development of the environmental supplier evaluations. This also gave an insight to the implementation process, from their perspective, and an insight to the organisational structure in the organisation as such.

4.1.3 Qualitative versus quantitative research

This section introduces the arguments for choosing a qualitative rather than quantitative approach in the case study. Table 4 shows some of the main differences between qualitative research and research based on quantitative methods.

Qualitative research	Quantitative research
Answers questions of the type: what, how and why.	Answers questions of the type: how many and how much.
Anchored in interpretation	Anchored in calculations
Based on comprehension	Based on explanation
Is process oriented	Is based on situations / status

Table 4 Differences in qualitative research and quantitative research. Inspired by Denzin and Lincoln (1997).

Qualitative research is associated with an emphasis on qualities, specifically processes and meanings that are not measured in terms of quantity or amount. Qualitative research emphasises the social constructed nature of reality related to the relationship between the object being studied and the researcher. Qualitative research deals with how social experiences are created and why. Quantitative research on the other hand focuses on the measurement and analysis of quantitative issues. (Denzin and Lincoln, 2001)

Quantitative research includes issues like generation of numeric models, theories of numerical causal relationships, experimental control and manipulation of variables, and analysis of numerical data. (Denzin and Lincoln, 2001)

In social science quantitative research is sometimes contrasted with qualitative research. Qualitative research is the analysis and interpretation of e.g. observations and interviews with the purpose of finding underlying meanings and patterns of relationships. Qualitative research helps to gain a general sense of phenomena. For instance, in the social sciences qualitative research methods are often used to gain better understanding of such things as intentionality and meaning. (Denzin and Lincoln, 2001)

Table 5 shows the data collection methods applied in the different parts of the study.

Part of thesis	Chapters	Main data sources
Introduction	1- 3	▪ Theoretical publications ▪ Scientific Articles ▪ Experiences from CEMIP
Analytical perspective	4 - 5	▪ Theoretical publications
Case analyses	6- 12	▪ Qualitative interview ▪ Procedures ▪ Case-specific documents ▪ Stay at the organisation
Conclusion and perspectives	13-14	▪ Results from previous chapters ▪ Scientific Articles ▪ Text books

Table 5 Summary of the data collection methods used for different parts of the thesis.

The primary purpose with the interviews is to collect data about the different actors in the implementation of environmental supplier evaluations. The task is to investigate how they perceive their own role in the environmental communication with suppliers and how their perception of environmental efforts in the organisation differs according to their professional backgrounds and experiences.

Qualitative research can be described as a method that in one way or another are used in order to describe selected persons lifeworlds with the purpose of interpreting the meaning, both by registration and interpretation of what is said and how. (Kvale, 1997). This makes it reasonable to use qualitative methods in the research. The term lifeworld denotes the social realities of the actors involved. The concept of lifeworld is described further in chapter 5.

Understanding how the persons that conduct the implementation of green procurement interpret their project and their role in it is the subject of the thesis.

4.1.4 The qualitative nature of the case study

One argument for choosing a qualitative study is the interest in examining the meanings of the actors involved, rather than outcomes of the green procurement. A quantitative approach would have been feasible if the focus was identifying the number of supplier evaluations being made, or the number of purchasers using the supplier evaluations.

Another argument for using qualitative methods is a wish to examine how the purchasers and environmental coordinators make sense of their practices in the environmental effort of the organisation. Understanding this calls for an inductive approach.

This study focuses on the meanings, understandings and processes that are associated with the implementation of supplier evaluation schemes. Therefore a qualitative approach is chosen.

Quantitative research methods could have supplemented the study in relation to examining elements like the number of purchasers that are using the environmental supplier evaluations and the amount of products that are bought from environmentally approved suppliers. These “how many” and “how much” questions are not included in the study.

4.1.5 The employees included in the study

Groups of employees interviewed in the study:

Group of employee	Situated	Number of respondents
Central environmental employee	Fredericia	3
Employee from central purchasing department	Fredericia and Endstedværket	2 (out of 2)
Environmental employee at power plant	Nordjyllandsværket, Enstedværket, Herningværket, Skærbækværket, Studstrupværket, Grenaa power plant,	7
Purchasers from power plants	Enstedværket, Herningværket, Nordjyllandsværket, Esbjergværket, Skærbækværket, Måbjergværket, Studstrupværket	10
Project managers (purchases for projects)	Elsam Engineering (Skærbæk)	3

Table 5 Employees included in the study and the departments they are situated in.

In the case analyses it is mainly the central departments and three of the power plants which are addressed. The three power plants analysed are chosen to be as different as possible, especially focusing on their level of employee participation in the environmental work and their focus on external environmental versus occupational health and safety. The delimitation from analysing the rest of the power plants is argued by the fact that the amount of new insights decreases with each additional plant analysed and analysing three plants with different characteristics seems appropriate. The interviews from the other power pants are none the less used as inspiration especially in the synthesis and recommendations.

4.1.6 Considerations relating to the interviews

The considerations related to the qualitative interviews made are presented in the following. In the actual interview process it was useful to apply different types of interviews as the interviews often followed another pattern than expected. Recognising this can be beneficial for the interview process, and therefore having different tools in the interview toolbox was necessary. After table 6 is described how the different types of interview were combined in the interview process performed. The interviews were varying between semi-structured interview, narrative interview and discursive interview.

Structured interviews were not selected as a method in this study. The structured interview is characterised by having predetermined questions that are asked in a predetermined order and with predetermined response categories and thereby not facilitating the respondent to explain his working life and experiences with his own words. It would instead let the respondent consider and respond according to the researchers' terms and understandings. (Inspired by Denzin and Lincoln, 2000)

Type	Description
Semi structured interview	The interviewer has prepared a number of themes that the interview is based upon. There are a number of main questions and a suggestion for the order of the questions. When the respondent is guided to talk about the relevant topics the order of the questions is not that important, nor the exact formulation of the questions. The interviewer is still managing the interview as it is his job to make sure that the relevant topics are included in the interview. The interview is recorded for transcript.
Narrative interview	In the narrative interview the interviewer seeks to get the respondent to tell his story relating to specific situations he participated in. The story is to be as coherent as possible. The interviewer does not follow a classic question – answer schedule. As the respondent often expects the "usual" practice it is necessary to explain this. Another important task for the interviewer is to show during the interview that he wants to hear the story. The interviewer only intervenes with questions that facilitate the storytelling. The advantage of this kind of interview is that the respondent tells his own story in stead of being forced to reflect upon the questions asked and thereby having a theoretical or analytical approach to the story. The story often includes context related aspects that are difficult to find in a structured or semi-structured interview. Narrative interviews are an excellent source in order to get insights of the respondents' lifeworld.
Discursive interview	In a discursive interview the interviewer has the role of an expert / theorist. This can be beneficial related to some aspects of an interview. It is difficult to avoid that some parts of the interview becomes discursive as the respondent often knows that the interviewer has a theoretical background (and agenda) and will seek to meet this in his answers. This is facilitated by the fact that the interviewer might apply theoretical frames in the interview. Likewise does the respondent reflect upon their own theoretical knowledge when they respond.

Table 6 The different types of qualitative interview applied. (Denzin and Lincoln, 2000 and Jensen, 2000)

4.1.7 Using the different types of interview

The interviews were all planned as semi-structured interviews with duration of a bit more than an hour. In reality the interviews ended up being a mix of semi-structured, narrative and discursive interviews with duration of between one hour and three hours. The interviews had a structure that facilitated that the respondent started up by telling how they work and how this relates to the environmental supplier evaluations, therefore the interviews often started with narrative elements. The same was the case in other parts of the interviews that invited for narratives. The discursive elements are placed in the end of the interviews where the respondents are asked, for example, to reflect upon the differences in organisational subcultures in the organisation, and in this process the theory was presented to the respondents. The respondents also seem to seek those reflections that are not only a description of their daily work, but give more insight into the issues they do not consider being daily practice.

4.1.8 Planning the interview

Most of the interviews were conducted when visiting the head office in Elsam and the different power plants. Some of the interviews however were made over the telephone and they were more of a character of semi-structured interview than the others. The contact to the respondents was made through a central environmental employee in Elsam. He also helped in the process of identifying the respondents for the interviews.

4.1.9 Interview guides

The interview guides were redesigned for each category of employees, in order to fit their knowledge and working tasks. In the following the "total list" of aspects are presented and afterwards is given an overview of the aspects included for each group of employees.

Elements included in the interviews.

- Introduction: The background for the present job in Elsam, education, previous work experiences.
- The job: Organisational structure, content of daily practices, assignments related to environmental supplier assessments.
- The concept "environment": Understanding of the concept of "environment", Elsam and environmental issues, environmental issues in Elsam related to daily practices. Environmental efforts in Elsam: Explaining the most important efforts and their background, how are they initiated etc.
- Values in environmental communication with suppliers: The communication process, values related to the communication and other environmental aspects.

- The logic behind the environmental communication: Why does Elsam communicate with suppliers, what are the effects of the communication, changes in the communication historically. Implementation of the environmental assessment schemes: The process, experiences, drivers, barriers, results.
- Communication with suppliers besides the environmental issues: Communication methods, procurement criteria and frequency of communication. Implementation of environmental communication with suppliers of service: The process, experiences, drivers, barriers, results.
- Implementation of environmental demands for suppliers in larger construction projects: The process, experiences, drivers, barriers, results.
- Ongoing communication with suppliers on environmental issues in large construction projects: Environmental issues as a part of the specification of requirements for the project, environmental issues in tendering.
- Environmental demands in project planning: Types of environmental communication, product chain perspectives, demands for life cycle impacts versus process demands.
- Sources for information on environmental issues: Internally in the organisation an externally e.g. participation in networks.
- Internal communication processes: Communication between environmental and purchasing departments both local and central.
- The advantages and disadvantages of long traditions for collaboration versus new employees: Frequency of communication, barriers for communication.
- Coordination between central demands for procurement versus local demands: The local criteria for environmental supplier evaluations and how they are developed.
- The organisational structure with an external central environmental department: The consequences by the organisational decoupling of the central environmental department.
- The language related to environmental issues: Associations between Elsam and the term “environment”, visibility of environmental issues in the organisation.
- Supply chain perspectives: types of demands in a life cycle perspective, appropriateness of demands.
- Environmental communication with external stakeholders besides suppliers: Communication with local authorities etc.
- Changes in the environmental communication: Practical and organisational possibilities for improvements / changes in the communication processes.
- Open question: Things that the respondent would like to add as supplement or discuss.

In table 7 are presented the aspects included in the different interviews.

Elements in the interview	Central environmental coordinators	Local environmental coordinators	Local purchasers	Central purchasers	Project managers (project purchasers)
Introduction.	X	X	X	X	X
The job position	X	X	X	X	X
The concept “environment”.	X	X	X	X	X
Environmental efforts in Elsam.	X	X	X	X	X
Values in green procurement.	X	X	X	X	X
The logic behind the environmental communication.	X	X	X	X	X
Implementation of environmental assessment schemes.	X	X	X	X	
Communication with suppliers besides green procurement.					X
Implementation of green procurement for service suppliers.		X	X		
Green procurement and project management.					X
Environmental demands in project planning.					X
Sources for information on environmental issues.	X		X	X	X
Internal communication processes.	X	X	X		X
The advantages and disadvantages of traditions for collaboration between specific actors.	X	X			
Coordination between central demands for procurement versus local demands.		X	X		
The organisational structure with an external central environmental department.	X	X	X		
The language related to environmental issues.	X	X	X	X	X
Supply chain perspectives.	X	X	X	X	X
Environmental communication with external stakeholders besides suppliers.		X	X	X	
Changes in the environmental communication.	X	X	X	X	X
Open question.	X	X	X	X	X

Table 7 Aspects included in interview for each category of employees.

The structure of the interviews were planned so that the narrative elements were placed at the beginning of the interview and the more reflective and discursive elements at the end.

4.1.10 Dilemmas related to qualitative interviews

Three dilemmas related to conducting qualitative interviews are presented below together with an explanation of how they occurred and how they were handled.

	Description	Occurrence in the interviews and reflections
The theoretical dilemma	The theory is necessary in order to develop the questions and control the interview; on the other hand it is important to have in inductive approach to the respondent. (Jensen, 2000)	In the beginning of the interview the focus is on an inductive approach, later on the theory becomes more 'in control'. The respondents begin with explaining their normal practices facilitating reflections later on in the interview. Never the less some of them occasionally asked "what are you trying to figure out by asking that question", then it was necessary to discuss theory as well.
The emotional dilemma	Trust is important to get a good interview, and to get the person to speak freely. Trying to understand the respondents' feelings are important, but it is also important that the interviewer is involved in a sense that restricts the wish to ask specific questions. (Jensen, 2000)	Most of the interviews started up with a cup of coffee and a general discussion of their job, my study and the reason for being there. At the same time it was discussed what the interview would be used for, and what the work in CE-MIP in general is concerned with. This seemed as a good way of building trust, and also showed that I had an open mind. Even though I know some of the central employees well, I did not "choose sides" but tried to be objective when critical issues came up.
The moral dilemma	A well functioning interview has the structure like a conversation (symmetry) on the other hand the interviewer has to secure that the methods and theory is taken care of. It is not a symmetric situation as it primarily is the interviewer that gains from the process. (Jensen, 2000)	Securing that the respondent was aware of the purpose of the interview was important. Explaining that the results of the analysis would be made available for the respondents later on was another way of trying to secure that the respondents also gained from the process. Some of the interviews were more of a discursive character, and later on several of the respondents contacted me in order to discuss similar issues.

Table 8 Dilemmas related to the interview process.

Generally the dilemmas were mainly a problem in the interviews conducted by telephone; it is difficult to gain trust over the phone, the process becomes more structured and less inductive when there is not a cop of coffee on the table and there is limited informal introductions before the interview.

4.2 Transcription of interviews

The interviews were not transcribed from one end to another, instead only the passages with relevance were transcribed, and the process of analysing therefore started already at this stage. This means that the data material became easier to use later on; the amount of text from each interview was limited from about 25 pages to 10-15 and the text was categorised within the main topics of the interview. The total amount of interview-text ended up being more than 250 pages. These are not included as appendix as they are confidential.

4.3 Other data sources

Several types of data are applied in the case study besides the interview; these are presented in the following.

Procedures

The green procurement procedures, both those that are applied centrally and at the power plants, have been beneficial materials in order to fully understand the way the environmental criteria for the suppliers are formulated and evaluated. This has been a beneficial supplement to the oral descriptions, especially when the power plant has different, locally adapted procedures.

Elsam has developed a procedure for managing environmental aspects of larger projects. Some of these aspects relate to the contractors that are involved in the projects. This procedure is beneficial in order to understand how environmental aspects are included in large construction projects. Other procedures from the environmental management system have been applied as inspiration as well.

Environmental reports and green accounts

Each year Elsam publish an environmental report, this gives information about the present activities in the environmental area. The environmental reports and the green accounts from the power plants have been an information source for understanding how Elsam perceives the overall environmental impacts and target areas both locally and centrally. Together with the environmental green accounts from the power plants the environmental reports have been applied in order to understand the overall environmental impacts of the organisation.

Inputs from Egon Raun Hansen

The main contact person in the central environmental department has written a text explaining the history of implementing environmental supplier evaluation in Elsam. This is a starting point for the discussions, being aware that it reflects his perception of the implementation process and is not an objective general description. In this text, however, some of the incentives are described for starting the implementation process, and these are applied as a supplement to the interviews made within that department.

Supplier information and questionnaire

The information sent to the suppliers and the questions differ to some degree from power plant to power plant. They were examined in order to make sure that the questions related to these specific documents were understood correctly by the interviewee. They have also formed the basis for identifying local changes in the demands set for the suppliers.

General information from the organisation

Homepages, brochures and other documents describe the environmental image the organisation is showing to the general public.

4.4 Analysis

As explained in section 4.2 the analysis already begins in the transcription phase. The purpose of the analyses phase is to get an overview of a large quantity of text. As this is a chapter explaining the method applied in the study, this section focuses on explaining how this overview is gained and how the texts afterwards are analysed.

The analysis facilitates a process where the gain from the texts is bigger than just by reading the text.

4.4.1 Categorisation and integrating a new theoretical approach

Categorisation of interview text means that the sequences in the interview relevant for specific issues are identified and categorised together with other paragraphs that deal with the same issue (Kvale, 1997). The two main categories applied have their basis in the theory that formed the basis for the interview guide and other interesting aspects that showed up during the interviews.

Having an inductive approach in the interview facilitated the occurrence of new aspects to be identified. Likewise, several aspects included in the interview guide were not based on the theory but based on discussions with employees in Elsam. The new aspects that showed up in the interview formed the basis for including translation processes in the theoretical framework. This theory was beneficial in order to explain both the interactions between the employees and the background for differences in subcultures at the power plants.

This has lead to a structure in the empirical chapters were the description of the cases are based on the theory relating to social constructivism.

4.5 Verification

In the following is described the verification of the results of the analysis and the collection of data. The verification are split into four aspects; working with the interview text, generalizability, reliability and validity.

4.5.1 Working with the text

Objectivity when working with an interview text is difficult as it is impossible not to have a perspective when reading the text. That perspective is among other things influenced by the theoretical background, and this affects the interpretations of the text. (Kvale, 1997) In other words; there will always be a perceptive subjectivity in the research process. This is also the case when reading through the interview text, different persons with different backgrounds will have different interpretations and might even not agree upon which paragraphs of the text contain interesting aspects. (Dixon, 2000) Talking about credibility of the interviews therefore has to be coupled to the questions that are answered by using the interview text.

One of the interesting perspectives when reading the text is whether the respondents are seen as informants or representatives. The difference is described in table 9 below.

	Respondent as informants	Respondent as representative
Type of information	Information about a certain phenomenon. (Kvale, 1997)	What type of person the respondent can be described as. (Kvale, 1997)
Examples of texts that are useful	Explanations about communication between different actors e.g. environmental coordinators, purchasers and suppliers.	Narrative explanations about the persons view on environmental issues and more specific green procurement.

Table 9 Respondents as informants and representatives. Inspired by Kvale (1997).

Some paragraphs in the interview are useful both in order to describe a phenomenon and characterisations of the person, and some are mainly useful for one of the aspects. The analysis is concerned both with different phenomenon's complex elements (the communication and collaboration between different actors) and describing the types of persons the different actors are in relation to their job.

4.5.2 Generalizability

The choice of case influences the types of generalisations that are possible, as described in section 4.1.1. It has not been the intention to be able to generalise the results directly to a huge number of similar cases in Denmark or abroad. As the case-company has an untraditional organisational structure this might influence the generalizability of the results.

The purpose has been to show what affected the implementation processes and apply these results in order to create recommendations for changes in the case-organisation. That being said the possibility for generalising the results is discussed further in the last chapter in the thesis. Another purpose has been to investigate whether the theoretical framework was developed appropriately in order to make these analyses. The analytical framework can hopefully be beneficial in other studies as well.

4.5.3 Reliability

In qualitative studies the reliability is not concerned with how measurements are made and the accuracy of these measurements, as is the case with quantitative data. In a qualitative study reliability deals with consistency, namely whether the interviewer is consistent in the collection of data. This does not mean that the interviews are identical, as different persons are interviewed differently. (Kvale, 1997)

There are especially two problems that occur when doing interviews: Differences in openness and differences in concreteness. (Jensen, 2000)

When making 23 interviews the balance between openness and concreteness might change. When the same interviewer makes all the interviews the knowledge of the area and the actions increases, therefore it is difficult not to become increasingly more concrete. When conducting the first interviews it is easy to have en inductive approach but later in the row of interviews the questions easily become more concrete.

This has both advantages and disadvantages. The advantage is that it might be possible to go deeper into the subject when the area is well known to you. On the other hand it is important not to focus on getting the last respondent primarily to confirm or invalidate the knowledge already obtained as this hinders an inductive approach. (Fog, 1994)

There is a tendency in the last interviews made not to have as inductive approach as the first interviews. This might have been worsened by the fact that these interviews were conducted by telephone which hindered non verbal communication in the interview process.

4.5.4 Validity

In a qualitative study the concept of validity is connected with whether the method applied is appropriate relating to the investigated field. In section 4.1 is argued that qualitative methods are appropriate in this study.

Another aspect related to validity is whether the respondents can recognise themselves in the analyses made. Therefore the primary analysis of the interview text is sent to the respondents before the quotes are included in the thesis. This leads to a form of triangulation of the results with the purpose to secure the validity. During the study the preliminary results have been presented for the central environmental department in Elsam and the CEMIP companies as another form of triangulation.

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5 Theory of organisational reality

The purpose of this chapter is to develop a theoretical framework for the case analyses. It is chosen to apply the theory of organisational culture and theory of lifeworlds as a representative of the social and the individual parts of the theoretical framework.

This chapter introduces how the concepts of organisational culture have developed since the 1880s. It also shows how social constructivism sees organisational culture as "a root metaphor for organisations" (Smircich, 1983), later renamed "the social construction perspective" (Darmer, 1992). The concept of culture is introduced to understand the social constructs whereas the concept lifeworld is introduced to understand the individual constructs. This leads to the main focus of the chapter, namely to describe how reality in organisational research is conceptualised as an integration of the four dimensions: Facts, logic, value and communication. Afterwards these concepts are modified in order to suit the analysis in this project. The revised concept of lifeworld is seen as an integration of: Practices and artefacts, reasoning, values and communication.

As it mainly addresses the individual constructs the theory has limited focus on the interaction and translation processes between subcultures. Therefore the chapter is rounded off with an introduction to translation processes, focussing on boundary objects and brokers, as a means to analyse the translation processes between the departments in Elsam.

5.1 Organisational culture an introduction

In the past 25 years the concept of organisational culture has obtained a wide acceptance as a way to understand human systems. In the 1980s several books on corporate culture gained wide acceptance, especially in the United States (Hatch, 1997).

As the concept of organisational culture developed in the 1980s, it showed an alternative to the rational views of the organisations as closed, target oriented units with members that behaved rationally and were governed by rules, procedures and formal structures. (Scott, 2003)

The concept of organisational culture included a discussion of what organisations actually are and this lead to different views of cultures and cultural understandings. Smircich (1983) split these different views into two main categories: Culture as a background factor; an organisational variable, and culture as a metaphor for conceptualising organisations. In other words, the duality focuses on culture as something that organisations *have* or something that organisations *are*; does the organisation *have* a culture or *is it* a culture. (Smircich, 1983)

Later, other terms have been applied for the two views, for example, in Schultz (1990) culture as an organisational variable is denoted “the functionalist perspective” and culture as a root metaphor is denoted “the symbolic perspective”.

5.1.1 Culture as a variable –a functionalistic approach

Culture as a variable has its basis in a classic system-oriented understanding of organisations. Culture is an independent variable on equal terms with, for example, structure, technology and goals. Cultures are seen as an organisational variable, either independent or external; imported into the organisation through the membership. The culture is relevant in the patterns of attitude and practices of individual organisational members. Culture is able to predict and thereby cause specific outcomes. The research based on this view mainly focuses on describing differences among cultures and shows the implications for organizational effectiveness (Smircich, 1983) One of the most well known books related to this is “Theory Z” (Ouchi, 1981).

Other authors see culture as an internal variable; organisations are themselves culture producing phenomena. Organisations are seen as a social instrument that has the main products of goods and services but as by-product produces distinctive cultural artefacts such as rituals and legends. The focus is on the social-cultural properties that develop within organisations. (Smircich, 1983) Research within this perception of culture is generally based on the system theory framework. By adding culture to the organisational variables all the irrational, apparently meaningless, events in an organisation are transformed into a rational part of the organisational life. Instead of explaining the irrational-like values, artefacts and subcultures they are a part of understanding organisations. Schein defined culture as:

The culture of a group can be defined as: A pattern of shared basic assumptions that the group learned as it solved its problems of external adaptation and internal integration, that has worked well enough to be considered valid and therefore, to be taught to new members as the correct way to perceive, think, and feel in relation to those problems. (Schein, 1991)

Culture is the social or normative glue that holds an organisation together. There are two main challenges for the culture: integrating new individuals into the culture, and adapting to the external environment. (Smircich, 1983)

What is this social glue made of? The core of the organisational culture is constituted of a social pattern of basic assumptions that manifests itself in the values. In other words, the core of the culture is collective and non conscious and guides the organisational members’ perception and their behaviour. (Christensen, 2003)

Then where does the culture live? This is not addressed because the cultural theory focuses on the social interactions. Therefore culture on the one hand is identified as a phenomenon based on the consciousness but is on the other hand a social structure manifested in the common basic assumptions outside the individual perception.

What makes it possible to have a social cognitive structure? And what is the relationship between the social and the individual level? These questions are not addressed in the cultural variable theory, as culture is analysed as an independent variable decoupled from the individual. The variable approach makes it possible for managers to change the culture and maybe even determine how it should be. If existing, subcultures are a sign of weakness for the culture; the culture is not strong enough. (Christensen, 2003)

The individual acts in relation to many different socio-cultural contexts, both related to the private and working-life. Therefore the organisational context is only one of many contexts. Is it then reasonable to assume that the organisational culture has free access to the individual, and that the employees are freely socialised into the culture? Can it be assumed that managers can determine and change this culture and its values, knowing that the individuals are part of other socio-cultural contexts as well? These questions are dealt with in second of the two main concepts of cultures, as it includes the relations between the individual and the society, and the importance of the individual perceptions. The second concept of cultures is presented in the following section.

5.1.2 Culture as a root metaphor for conceptualising organisations –a symbolic approach

Culture as a root metaphor describes organisations as cultures. This differentiates significantly from the variable approach which describes organisations as expressive forms, manifestations of human consciousness. (Smircich, 1983) The research agenda from this perspective is to explore organisations as subjective experiences and investigate patterns that make organized action possible. (Smircich, 1983)

Seen from a social constructivist point of view organisations are a part of the socially constructed reality that is created in the interaction with other people. Organizational culture is thereby social constructs developed through expressions by the individual members of an organisation. (Christensen, 2003)

As for cultures as variables, the focus in cultures as a root metaphor is on language, symbols, rituals etc. However, they are not just cultural artefacts but a part of the continuous social interaction processes that create and reshape organisations in a dialectic process. As organisational culture is a product of continuous interaction, organisations are not clearly defined and they are changeable. The meanings of the culture are not necessarily shared by all individuals but are manifested in different subcultures. (Smircich, 1983)

As social constructivists are more concerned with the social constructs than the individual, the root metaphor perspective does not stress that the individual is an active creator (Christensen, 2003). This means that organisations are a social phenomenon but culture is discussed independent of the individual actors.

Where the cultural approaches described above deal mainly with social aspects, the lifeworlds concept stresses the individual constructs, and how these constructs are developed through social interaction. On the other hand, lifeworld is also a social matter as the shaping and reshaping of individual constructs is in a dialectic relationship with developments in the social cultural context - a context created within the very same process. With reference to Dixon (1999), the private meaning structures that are made assessable and make sense to organisational members are reflected in the collective meaning structures of the organisation – and the collective meaning structures that are assessable and make sense for the individuals are made private.

5.2 Comparing the two approaches to organisational culture

In table 10 a comparison of some of the characteristics of the two approaches to organisational culture are given. There is focus on the central characteristics for this study.

Characteristics	Organisational culture as a system variable	Organisational culture as a root metaphor
What is culture?	Culture is the social or normative glue that holds the organisation together, a variable.	Culture is something an organisation is. Culture is a process created by the members.
Individual versus social	The individuals are socialised into the organisation.	The individuals are an active creator of the culture. Organisations are subjective social constructs.
Subcultures	Subcultures are a sign of weakness of the culture.	Subcultures express the individual interpretation of meaning structures.
Research focuses on	Values, social ideas, beliefs. These are manifested in myths, stories and specialised language.	The same as for the variable approach, but as a part of the social interaction, creating, recreating and changing the culture

Table 10 Comparison of organisational culture as a variable and as a root metaphor. Based on Smircich (1983).

Deciding what theoretical perspective to apply in the organisational analysis is important; if the culture is an organisational variable it can be changed as easily as, for example, policies. When culture is something organisations are, this might be harder to alter. In both perspectives organisational culture influences the process of implementing new initiatives.

5.3 Choosing approach: Organisational culture as a root metaphor

The first reason for choosing organisational culture as a root metaphor is the acceptance of subcultures, and the focus on ambiguous understandings in the perception of reality where the organisation has more than one culture. This seems appropriate in relation to the case study as the different departments have differences in organisational cultures, or at least this is how the central environmental coordinators perceive it (Raun, 2006). Focus on subcultures and individual perceptions of reality are important, as the study deals with cultural differences that occur in the implementation of supplier evaluations in the different departments. Therefore, the descriptions of organisational cultures have to support the occurrence of differences in cultures in the departments.

The second reason for choosing the root metaphor approach is that external conditions are considered to affect the organisational culture; as individuals are involved in different cultures, both private and professional. Some of these cultures cross the boundaries of the organisation and therefore affect the organisational culture. These cultures that cross the boundaries of the organisation can, for example, be related to private interests, or professional cultures established due to education. (Smircich, 1983) An example: The environmental education of the environmental coordinator influences the subculture in his department and likewise with employees that have a personal/private interest in environmental issues. Therefore, employees do not enter the organisation without cultural affiliation, and that is reflected in the private meaning structures they bring into the organisation. This is important in order to examine differences in subcultures.

The social constructivist approach is applied in the analysis of the individual departments and when dealing with subcultures in the departments.

5.4 Organisational culture and lifeworlds

The purpose of this section is to illustrate the appliance of the concepts of lifeworld, organisational culture and subcultures in this study. In the previous section lifeworld as an individual perspective on organisational life has been mentioned. Lifeworld as a concept is expressing the subjective and individual perception of organisational life. (Christensen, 2003)

The selection between the individual and the social parts of organisational culture builds upon the premise that organisational culture is socially constructed. Reality is on the one hand constructed individually in the lifeworld, but on the other hand created in the social interaction with others. This is because our predecessors have constructed a social reality that we are socialised into. (Christensen, 2003)

The concept of culture provides a framework for understanding the social constructs within an organisation. In the same way lifeworlds are a way to understand the individual perception of organisational life. (Christensen, 2003) Including both the individual and the social level is essential for the analyses and the way the theoretical framework is developed (see section 5.14).

Analysing the lifeworld of individuals only gives an insight in the respondent's individual perceptions of the life in organisations. Understanding the lifeworld of an individual not only makes it possible to understand the practices but also understand why the individual reacts as they do. (Jensen, 2006). Qualitative interviews can be used to describe the practice of the individual. Each interview gives an insight in the individual lifeworld, but not a full insight into the subcultures. At some point most of what you hear is familiar to you, and you have mapped a subculture. Therefore getting insight in several individual lifeworlds gives insight in the subcultures as illustrated below.

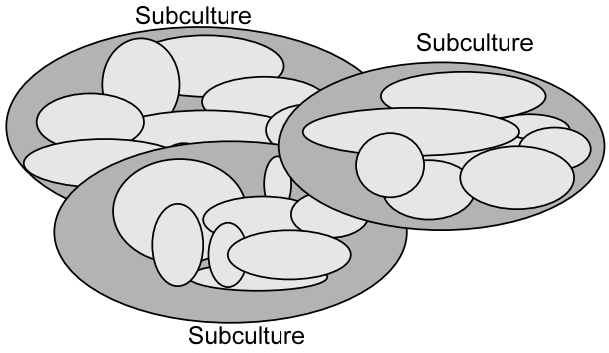

Figure 14 Combining the insights of lifeworlds from different actors in order to understand the subcultures in the organisation.

The small circles in figure 14 illustrate the part of the lifeworlds that are relevant in the organisational context. The organizational culture is not necessarily (and most unlikely) homogeneous, and it can consist of several subcultures. The criteria for a subculture to be organisational are dependent on a close relation to the organisational members. It also needs to be of relevance for the operation of the organisation. The term "of relevance" should be understood as a broad concept including the sharing of meaning structures that are only indirectly relevant for the organisation. For example, some of the employees get an environmental education and through this develops a subculture.

The lifeworlds are individual, but if the actors are a part of the same organisation the lifeworlds have similarities. The more persons that are included, the more accurate the picture of the organisational subcultures becomes. On the other hand, the amount of "new knowledge" reduces as the number of individual actors that are included in the study increases. The similarities in the lifeworlds show the socialised or shared aspects of the organisation; the collective meaning structures.

Through the interviews the practice of the purchasers and the environmental coordinators are described. Some issues are similar from interview to interview and others are different. The purpose of making a number of interviews is that each of them gives new insight to the differences in practices. The advantage of making several interviews concerning a specific topic is that the practices you describe go beyond the information you can get from a single respondent. The collective lifeworlds represent a given culture.

5.5 Lifeworld

The purpose of this sections it to develop a concept of lifeworld that can be applied in the case analyses. Firstly is explained how the concepts of world and reality are related to each other and how the reality is constituted.

5.5.1 Reality and Lifeworld

In 1966 Peter L. Berger and Thomas Luckmann introduced social constructivism as a school of thought in their book "The Social Construction of Reality". Social constructivism explains how a groups and individuals perceive reality. Reality changes over time; it is an ongoing process where people react on their perception and interpretation of reality. A social construction is an idea which is obvious to those who accept it, but others might not accept or understand it. Social constructs are then, in some sense, human choices rather than laws resulting from an essential will.

The reality is created individually, but at the same time created in the interaction with others. (Berger and Luckmann, 1999) Other people (the predecessors) have created an understanding of reality that individuals are socialised into, this is the creation of reality that "social construction" refers to. The everyday creation of reality is based on the social interaction that again is based on the individual lifeworlds. The results of the interaction are recreation and changes of the lifeworlds.

Schultz (1970) has suggested that individuals are subject to the conceptions of time, space and the social. The lifeworld can be perceived as a place of thoughts, structured or dimensioned by time, space and the social interaction. Time is related to the consciousness of a past, a present and a future. There is both continuity but also finality in existence. (Berger and Luckmann, 1999). It is a matter of space as the things that are nearest are those that can be changed through handling things and interacting with other people. The reality is coupled to the relations to others and the experiences of the others; coupled to how well the individual knows the other person. The social aspects are related to space; they are created in the interaction with others. (Berger and Luckmann, 1999)

Reality is based on individual or shared human experience and is the totality of all the experiences including things, structures (actual and conceptual), events (past and present) and phenomena. (Henriksen et al., 2004)

Realities are subjective as they are private constructs. For example, an environmental policy is a given organisational fact but different actors perceive it differently. An environmental employee might see it as a guidance object for his work, while a purchaser might see it as almost meaningless words with no relevance to him. The policy is definitely a part of the world, but interpreted differently in the different realities.

5.5.2 Lifeworlds and organisational change

Analyzing lifeworld, where the data collection is based on interviews, attempts to identify individual characteristics of the respondent. Lifeworlds contain representations of artefacts such as tools that support specific activities, and getting the respondents to explain these artefacts is one of the issues included in the interviews.

When investigating the backgrounds in the lifeworld there are meanings and relations between the things that are done. This meaning can be made clear to others through verbal communication. (Henriksen et. al. 2004) As long as the communication and the practices make sense, the logic will seem appropriate; when the interaction is not successful the logic differs, assuming there is an awareness of the differences in understanding what is communicated.

Following is an example from the case study that illustrates different perceptions related to the lifeworlds of the purchaser and the environmental coordinators. The differences make it difficult to communicate.

Example: Lifeworld of purchasers and environmental coordinators

Some of the purchasers find it hard to understand the benefits in setting environmental demands for the suppliers; they feel that the questionnaires do not lead to any environmental improvements or actual consequences for the supply. Besides this, the environmental assessment relates to the suppliers, and not the products; as e.g. quality and price do. The purchasers therefore feel that they cause inconvenience with the suppliers without purpose.

The environmental department argues that setting these environmental demands is a part of organisational policies, and therefore the purchasers have to do so. The purchasers argue with practices whereas the environmental department argues with policies.

They never come to a consensus but together the two groups develop a questionnaire that is a result of the lowest common denominator they can agree upon. None of them are satisfied with the solution because they argue with different perceptions about setting environmental demands, and both groups feel that the other group got their will.
(Raun, 2006) and (Iversen, 2006)

5.6 Lifeworld as facts, logic, value and communication

There are differences between the world and reality. The world consists of everything: people, information, cities, cars, animals, etc., all the entities. Reality is the knowledge about, awareness of and feelings for the world. Reality consists of the things that are of interest; the things that work for the individual. Reality is based on the things that are integrated in the individually constructed reality; the lifeworld. (Henriksen et al., 2004)

Realities are not only private constructs; if the realities were not shared it would be difficult to communicate with each other. Communicating realities is easier to individuals that share large parts of the reality; this makes it difficult for the environmental department to develop tools for e.g. marketing as it showed to be the case in the CEMIP companies. On the other hand it was easy for the CEMIP working group to share experiences and comprehend each other as the realities were similar. Through the three year period in CEMIP the process became even easier as a shared environmental understanding developed.

Reality is constructed by integrating the four key dimensions: facts, logic, values and communication. (Henriksen et al., 2004) This is illustrated in figure 15.

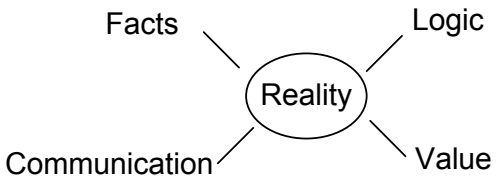

Figure 15 Reality constructed by integrating the four key dimensions: facts, logic, values and communication (Henriksen et al., 2004).

Through practices, possibilities (a part of logic in figure 15) are made into realities. Some possibilities do not become real, but the possibilities make it possible to change reality.

Facts include both artefacts and historical facts (practices). The facts are related to the past and the present but not the future. They do not describe reality but simply show that something has happened. We use logic to figure out future possibilities; the process of turning possibilities into realities is based on the process where reality provides the individual with the ability to think of a future. (Henriksen et al., 2004) Values show what is of importance. Values can be seen as the stable part of reality whereas possibilities are changed easier. Communication is a tool that makes individuals share understandings and create shared constructs; the link that binds realities together. From the individual point of view communication provides access to facts, logic and values through the dialogue with other people, and starts the interpretation process. Communication also makes it possible to create and change the reality. (Henriksen et al. 2004) From another point of view communication is also a way of socialising people into a given culture and existing practices in an organisation, and thereby communication also affects the individual realities.

Facts, logic, value and communication emphasise different features of reality, but they cannot be described in an isolated fashion as they are dependent on one another. Each person or group creates a reality that both complies with and goes against the specific social setting they are a part of; this makes the reality subjective and individual. As mentioned previously similarities exist between the individual realities, for example between different actors in the organisation. (Henriksen et al., 2004)

Organisational changes leads to changes in logic, facts, values and communication. But rather than being perceived as a result or an outcome, organisational changes should be seen as a process of recreating integrated realities. The realities become disconnected from the organisational realities if the actors in the organisation are not capable of being coherent in their facts, logic, values and communication. In the individual level a lack of socialisation results in individual realities being disconnected from the organisational realities. (Henriksen et al., 2004)

5.7 Facts as practices and artefacts

Facts are the material realities, historical facts, of what is done and what is said. Facts are what make experiences more than illusions, and therefore they are a central part of the constitution of reality. Facts do not explain anything; they are merely facts. (Henriksen et al., 2004)

When related to science, facts are objective and seen as a contradiction to human emotional and subjective senses. But facts are more than that; not only are the number of employees in the organisation and the environmental certificate facts, the practices of the actors are also facts.

Facts are related to the past and the present as facts about the future are not known yet. Facts shows that something is happening, but it does not make it possible to identify why and what this means. Facts gives access to the world, and experiences and tradition are used to show the meaning of facts. (Henriksen et al., 2004)

When encountering a fact that does not fit into the well known concepts, the creation of new concepts may occur. Facts that do not fit into the known concepts are called foreign facts. An example of a foreign fact could be environmental demands that are put into purchasing procedures that traditionally focus on quality, function and price.

Historical facts are not defined as anything that has happened in history, but has a more narrow definition. Historical facts are events which influences the actors and that bring about lasting changes in their pattern of thinking and acting. (Henriksen 2004)

Benson (1977) argues that official organisational information is an appropriate place to start getting to know about organisations. The organisational information presents some facts about the organisation, e.g. number of employees, when they were established, what products they produce, their main customer categories and their policies. This information can be found in web-pages, brochures, mission statements and other publicly available sources. These types of facts are interesting as they present the official image of the organisation; the image that the dominant actors, e.g. management and board members, would like to publish. Thereby the picture of the organisation that is based on the official facts reflects the view that the dominant actors want to give of the organisation. (Benson, 1977)

Meeting the actors in the organisation might reveal another image of the facts than the dominant actors want to give. Maybe the brochures are old or no one really takes the policies seriously. This indicates that the facts have to be interpreted in interaction with relation to the actors of the organisation. What were facts from an external point of view might not quantify as fact from an internal perspective. (Benson, 1977)

In Henriksen et al. (2004) it is emphasised that technology is an important bearer of facts and therefore technology is important when dealing with facts. Organisations use all sorts of technology – accounting systems, production technology, communication technology and so on. The actors use and manipulate these technologies and they are an important part of the organisation. The way technology is used to provide facts is not objective, as the interpretation of both facts and technology differ.

Technology can be described as artefacts as it is knowledge of artefacts, their use, their manufacturing and their role in a social context. Practice shows how technology is applied in the social context.

The following section describes how the concept of facts is applied in this thesis.

5.7.1 Appliance of the concepts practices and artefacts

The concept of facts is applied in the case analysis in two ways. The practices revealed through the interviews represent the environmental effort which is the object of investigation. Organisational facts are also revealed in the interviews. Artefacts that the individuals in the organisation perceive to be of importance are included, as they relate to these artefacts when explaining the environmental effort.

The concept of fact is easily associated with generally accepted matters of truth. Thereby the concept practices seem more appropriate in the case analysis as they underpin the practices that construct and reconstruct lifeworlds and culture. The analysis focuses on the practices of the actors in the organisation. Some of these practices are none the less coupled to artefacts as practices can materialise themselves into artefacts, for example by developing green procurement procedures, which again motivates a certain type of practice. Table 11 shows the appliance of facts in the case study.

Type of fact	Example from case study
Artefacts	▪ Environmental management system (policies, procedures, instructions) ▪ Local artefacts at department level ▪ Supplier evaluation schemes ▪ Employees' description of the supplier evaluations (written document)
Practices	▪ Conducting environmental assessments of suppliers ▪ Implementation of the environmental assessment schemes ▪ Collaboration between purchasers and environmental coordinators ▪ Collaboration in the purchasing group

Table 11 The appliance of the concept of facts in the analysis.

Facts can not be considered separately from the other parts of reality (see figure 15). The environmental policies are for example closely linked to values in the organisation.

There is a distinction between systems of facts and lifeworlds, and this is important in the understanding of organisational change. An example of a system of facts is the new purchasing procedures and the changed appliance of supply agreements. in this case the systems are developed in order to assist the practices of the actors. If the systems lead to changes in the lifeworlds of the actors, and thereby lead to new practices, then the system has a purpose. If the systems become decoupled from the lifeworlds and the actual practices of the actors, then the systems are developed and sustained mainly for the sake of themselves. Thereby the systems become decoupled from the organisations and the purpose that it was indented to assist (Henriksen et al., 2004).

5.8 Logic

Logic describes how facts and thereby artefacts and practices are constructed and reconstructed. Through logic possibilities and expectations become a part of reality and can be turned into realities because of the possibility to think of a future. (Henriksen et al., 2004)

Actors use logic to show future possibilities within a changed organisation by transforming facts to possibilities with the use of logic. These possibilities make it possible to create a future that is different from the present. Logic is subjective, as it works through human beings. (Henriksen et al., 2004)

Formal logic is the structure or form of reasoning that is based on abstract conceptualisation; the kind of logic used in scientific and mathematical theories. Informal logic on the other hand is applied in the sort of matter people choose to argue about in their everyday lives, e.g. people arguing about how to deal with global warming or how to handle the new demands from management. In the informal logic, argument is distinguished from the rational reasoning of the formal logic. (Henriksen et al., 2004)

Material logic is embedded in artefacts and formalised procedures, rules and methods. The reasoning behind the argumentation for chosen procedures for supplier evaluation is an example. Material logic, for example, tells you what to do if you want to do a specific job. Logic can be mediated through technological systems that impose actions upon actors through their built-in material logic. (Henriksen et al., 2004)

Social logic is used in interaction with others. Social logic is closely related the organisational culture. Social logic is constructed by the actors in the organisation and their subjective logics. The social logic is influenced by traditions and previous experiences. In an organisation the social logic helps the actors to maintain a sense of and simplify the world – and thereby construct the reality. (Henriksen et al., 2004)

Formal logic	Interactions with concepts / text	Embedded in concepts
Material logic	Interaction with things / materials	Embedded in artefacts
Social logic	Interaction with others	Embedded in practices

Table 12 Three types of logic and their occurrence.

One of the dilemmas of studying logic is that you need your own logic to see another. One way of becoming aware of logics is the dilemma that shows if others relate to a fact in another way than you. In itself logic does not tell about the world, but is essential in order to know about the world. (Henriksen et al., 2004)

5.9 Application of reasoning in the case study

The way the concept of "logic" is applied in this thesis relates to both the *subjective level* and a *process approach.* Therefore the applied term is reasoning.

As described in the previous section "logic" is, in Henriksen et al. (2004), applied as the concept that makes it possible to turn possibilities into realities, because logic makes it possible to think of the future possibilities. The future possibilities are included in the "reasoning" as it prescribes logic and a possible outcome, but at the same time logic also describes reasoning embedded in existing artefacts and present practices.

One way reasoning is investigated is by examining the logic embedded in structural changes in the organisation. Another area of investigation is how these strategies are transformed into possibilities on the local level through reasoning and finally end up in changed practices and new artefacts in the departments. An example is the green procurement procedures; there is a score chart with specific minimum requirements for supplier's. Whether this procedure actually leads to the intended changes in the practice for handling suppliers depends on the reasoning or the interpretation of the possibility for implementing the procedure. The reasoning behind the procedures on a central level is not automatically in line with the reasoning on a local level when implementing the procedures.

The individual/subjective reasoning is examined in the case-study through the interviews with the individual actors, asking them why the practices are carried out as they are and the logic behind interaction and collaboration. The social logic is investigated by comparing the different individual's reasoning and identifying similarities.

	Example from case study
Reasoning	▪ The reasoning applied to explain purposes and practices related to environmental effort and especially supplier evaluations. ▪ The reasoning for choosing specific environmental initiatives in Elsam. ▪ The reasoning behind focusing on supplier evaluations in Elsam both local and central. ▪ The reasoning applied in discussion of environmental issues ▪ The rational reasoning (centrally) that the development of the procedures automatically leads to implementation in practices. ▪ The common understandings amongst the purchasers that trust in the supplier relationships are important. ▪ Differences in the reasoning behind supplier evaluations. ▪ The general perception that environmental demands for supplier do not lead to actual improvements ▪ Logic embedded in artefacts e.g. questionnaires.

Table 13 Examples of the appliance of reasoning in the case study.

5.10 Values

The impacts on behaviour from the values of individuals are an important topic in the social sciences. (Amis et al., 2002). Organizational theorists have raised the awareness of the ways in which values affect organizational life. Schein (1985) and his discussion of values in cultures is one example. However, little emphasis has been put into examining the ways in which values affect the change process. (Amis and Slack, 2002)

Values are defined by Enz (1988) as:

"*the beliefs held by an individual or group regarding means and ends organisations 'ought to' or 'should' identify in the running of the enterprise*" (p. 287).

Values support the way organisations are designed and operated. The orientation of structures and systems in organisations are depending on the values embodied within them. Therefore a revision of the value structure of an organisation can lead to change in the structural design, and change in structures and systems leads to a shift in values. (Amish et al., 2002)

Values describe what ought to be done, what individuals think and how individuals believe that they should treat other people. Values are linked to social relations and show the individual's way of organising their wishes and ambitions. Values are subjective as they are concerned with relations between subjects. (Henriksen et al., 2004)

Some values are objectified and capable of acting as social values shared among the actors. The social values guide groups, organisations or societies. Values are understood through communication with other human beings. Values are not observable like practices and they are not comprehensible like logic, even though they become visible through both practice and logic. (Henriksen et al., 2004)

Values make it possible to transcend individual prejudices, and are central to the investigations of the world. Without values individuals would only be able to see the world as consisting of fact and logic. Values also have delimitations; it would not be possible to disclose anything about the world if the investigations were based solely on values, as the actual practice would be missing. That would lead to an investigation that would not be about the world, but about the investigators values. Therefore the values of the investigator are a part of the investigations as values are a central constituent of reality. (Henriksen et al., 2004)

Values are part of reality, as they shows what is of lasting importance. Possibilities are also a part of reality and can be turned into realities because of the possibility to think of a future. In that sense possibilities are unstable whereas values are a stable part of reality. (Henriksen et al., 2004).

Values are important in the process of social change as the way people act, are based on certain intentions and interests. These intentions and interests are often implicit and taken-for-granted, for example in the daily working practices. Values are connected to how persons act as they are applied in the determination of what is meaningful, true, good or fair. Value includes social norms; what the actors like and dislike. Values provide the basis for choices as they motivate and drive people. Intentions, motives, interests and willpower are some of the places values become evident. (Henriksen et al., 2004)

Related to organisational change, values play a role both in creating the change through the development of new values and in hindering the change processes because people are prisoners of their own values and that makes them resist change. (Henriksen 2004)

An example is environmental enthusiasts; a person is not likely to become an environmental enthusiast without having a personal, environmental interest, but on the other hand the enthusiasm will probably not be expressed if environmental issues are not valued in the organisational culture.

The effect of values as a resistance to change is important. (Bartunek, 1984 in Amis and Slack, 2002). Decisions are not solely based on performance as personal and political reasons for changing or not changing are important as well. While changes may be initiated by events in the environment, the outcomes are shaped by processes within the organisation. The effect of changes depends on whether the value structure in the organisation is generally supportive of, opposed to, or indifferent to the new changes. With a supportive value structure changes are likely to take place, but if the individuals in an organisation have values that oppose the change then resistance is likely. Affecting the individual values is important; this can be done through, for example, education. (Amis and Slack, 2002)

In Amis and Slack. (2002) a study of the organisational change and the role of value is presented. The main conclusions are that, in a change process, the organizational members faced with a forthcoming change will react in a variety of ways. This reaction will, among other factors, depend on how closely the values held by individuals correspond with the changes introduced. If they are compatible, the individuals support the change; if they are not then resistance will be encountered. In the initial stage of change, forced pressures may be effective. But if the alterations are to last they must match the values held by organisation members. Values play an important role in influencing the outcome of a change process. (Amish et al., 2002)

In the table below is presented some of the values that are included in the case-analyses.

Type of value	Examples of values included in the study
Public values	▪ The Essential Energy concept including social, environmental and economical factors. ▪ "As an extension of our business concept and values we will: Encourage suppliers to incorporate environmental and occupational health and safety systems for production and products." (Part of environmental policy)
Local values	▪ The valuation of the environmental policy. ▪ The valuation of green procurement, e.g. – it is not important relative to other environmental initiatives in Elsam. ▪ The attitude towards environmental efforts of the department.

Table 14 Examples of the appliance of the concepts of value in the case study. The values are often materialised in practices and facts.

5.11 Communication

Communication concerns the actors' relation to other human beings and the way actors get access to logic, practice and artefacts as well as values – in other words, realities are socially constructed through communication. The language used depends on the different social structures the actor participates in. Because of this it is necessary to understand people's language in order to understand them at all. (Henriksen et al., 2004)

Communication makes it possible to tell others about the investigations into the world and realities. Communication is connected with the relation between people and is based on dialogue. Communication gives a tool to identify practices, reasoning and values in dialogue with others; it makes it possible to understand how these dimensions are socially embedded in everyday life. Communication is a link between people's realities and binds realities together. This makes it important to get a substantive understanding of organisations as language is a constitutive part of organisations. Communication can also lead to misinterpretations, as parts of other people's lifeworld are not a part of your own. However, it is possible to understanding each other, and thereby we are able to act socially in the world and get access to each others lifeworlds through communication. (Henriksen et al., 2004)

Language and communication are the only way to get access to reality; therefore it is necessary to build the investigation on the study of communication. (Henriksen et al., 2004)

5.11.1 Environmental communication and communication theory

Communication can be defined as "social interaction through messages", where messages should be understood in a broad content as both signs and written and oral messages. (Fiske, 1998)

In general all behaviour taking place in social interactions can be interpreted as communication, as all human behaviour has the possibility of affecting others and is thereby a social interaction. Refusing to communicate by not answering the phone or not responding on an e-mail is also communication as it affects others, and they interpret the lack of response.

Environmental communication in and between companies is based on individual actors as somebody is the sender and somebody receives the communication. In chapter 1, environmental communication is defined as:

"*Environmental communication is the processes that an organisation conducts to engage in collaboration with the network of internal and external stakeholders to encourage the sharing of information, collaboration and establishment of partnerships related to the organisations environmental and social impacts*."

When the sender is an organisation and the receiver is likewise, it is actually individuals who perform the communication. Therefore, communication between representatives of organisations and thereby individuals is central when dealing with environmental communication in product chains. Communication between individuals is a social interaction process, but different schools of communication theory have different points of view on what is actually regarded as social interaction. (Fiske, 1990)

A short introduction to the two primary schools within communication theory, namely the transmission and the semiotic school, is given in Appendix IV. In the following section it is discussed how they can be applied in the understanding of environmental communication.

Both communication schools perceive communication as social interaction. The transmission school defines social interaction as the process by which one person relates to the other or affects the behaviour and the way of thinking of the other. The semiotic school defines social interaction as the process that makes the individual a participant of a specific culture or society. (Fiske, 1990)

How can the two different schools be applied in the analysis of environmental communication? The transmission school focuses on how accurately the message can be transmitted, how precisely the meaning is communicated and how it is received. This seems adequate in order to analyse specific examples of environmental communication between companies. This is applied in the analysis of and work with communication in CEMIP. CEMIP actually focused on how to make communication more effective so that goals related to communication could be reached.

The semiotic school focuses on how communication is a part of the constructions of meanings and cultures. This is important when the individuals act as a part of the subcultures in the organisation (Fiske, 1990). The semiotic school is the focus taken in this thesis as it represents a social constructivist approach.

The organisational culture leads to another difference between the two schools, namely how the message is transformed into comprehension by the receiver. The transmission school focuses on the effectiveness and precision in the communication process, which makes misinterpretations possible to detect. The semiotic school on the other hand, focuses on the cultural differences that can lead to misinterpretations. It calls for a comprehensive insight in the culture to make semiotic analyses of texts, a process that is time consuming. (Hatch, 1997) The case study is focused on the first part, namely the cultural analyses, to get a comprehensive insight into the culture.

The case-analyses focus on the internal communication process. Examining the interaction between the internal stakeholders is a way of examining the sub-cultures.

5.11.2 Environmental communication – a model for understanding

Without going thoroughly into discussions about differences in different communication models and their strengths and weaknesses a model for understanding communication is presented in the following, inspired by Jacobsens communication model (see appendix IV).

The overall question related to communication is how environmental logic and values are diffusing through environmental communication between internal actors. The concept of lifeworld is stressed, as communication is understood as the interactions between different lifeworlds.

The media of the communication is of cause important for the communication but in the theoretical framework this is described as an artefact (See section 5.7). Likewise messages in the communication are presented by the concept of practices; covering what is said and done. Therefore the focus related to communication is on the interactions of the lifeworlds. See figure 16.

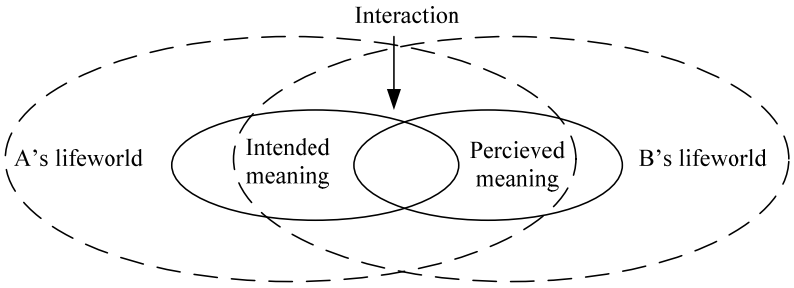

Figure 16 The communication process as applied in the case study.

The parts of the communication process that are not included previously, and therefore have the focus in this section, is the applied code (the rhetoric that couples logic and fact) and the level of interaction in the communication process.

In this thesis the concept of codes are applied to investigate how general messages within environmental communication are coded and decoded. It is the hypothesis that the decoding of environmental concepts by the purchasers and the environmental coordinators influences the implementation of green procurement.

Following is some examples of the ways communication is included in the case-study.

	Examples of how communication is included in the study
Code (The rhetoric or arguments used)	▪ The terms applied when the supplier assessments are explained ▪ The applied terminology related to environmental issues ▪ The terms the actors use to explain the concept of environment ▪ The terms used to emphasis important environmental issues
Proximity (level of interaction)	▪ Ways of getting access to environmental knowledge ▪ How often they meet and discuss environmental issues (frequency) ▪ How often they communicate

Table 15 Examples of the appliance of code and level of interaction related to the communication in the case study.

5.12 Revised model of reality

In section 5.7 - 5.11 parts of the model presented in figure 15 have been altered. The main changes are the following:

- The concept of facts is revised to practice and artefacts to fit the focus areas in this study. This is described in section 5.7
- The term logic is replaced with reasoning as explained in section 5.8.
- Communication is in Henriksen et al. (2004) seen as a separate part. In this thesis, communication is seen as the linkages between values, practices & artefacts and reasoning. Thereby the lifeworld is created and altered (socially constructed).

In figure 17 the changes developed in the previous sections are illustrated. The arrow in the figure to the right, illustrates the communication processes that make the other dimensions constitute reality.

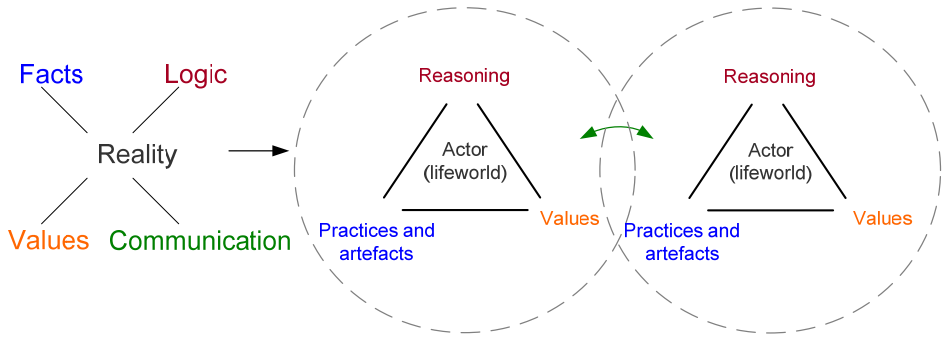

Figure 17 The perception of reality from Henriksen (2004) and the changes made in order to make it appropriate for this thesis.

The lifeworld of the actor is created through communication with others, and in the interpretation of the practices, artefacts, values and reasoning.

5.13 Lifeworlds and subcultures

Some of the questions to be answered in the thesis are: How do individual lifeworlds influence the implementation of green procurement? What are the similarities and differences in the way the actors perceive artefacts & practices, reasoning, logic and values? What is the connection between lifeworlds and subcultures on an analytical level?

In order to communicate as an organisation, a certain degree of coherence between the individual lifeworlds and organisational culture is needed. Differences in individual lifeworlds can be reflected in the green procurement practices.

As described in section 5.5.1, the lifeworlds of individuals have similarities (patterns in the lifeworlds are shared socially), but also differences (subjective/individual). In order to identify the subcultures, and explain the practices, these similarities and differences should be identified. In figure 18 it is illustrated how the lifeworlds of the different actors are communicated and either corroborated within a given subculture or questioned in the interaction with other subcultures. Sometimes several actors in a department are relevant for the environmental communication, and sometimes only a single one. In that case, the individual lifeworld is of cause important for the issue at hand.

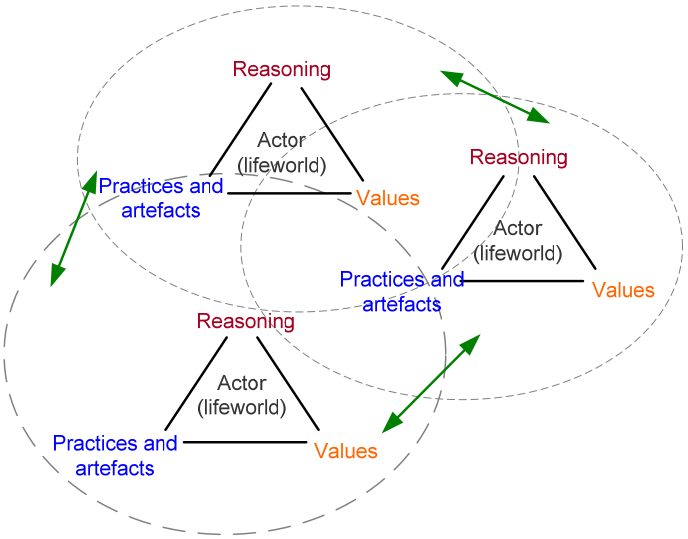

Figure 18 The relation between lifeworlds of different actors. The green arrows indicate communication processes.

There can be both differences and similarities between the subcultures at department level (which is actually what constitutes subcultures). When discussing this, the similarities in practices, values and reasoning are in focus. Identification of differences in subcultures makes it possible to show the difference between the power plants and their way of handling the green procurement.

The relationship between individuals and subcultures is illustrated in figure 19.

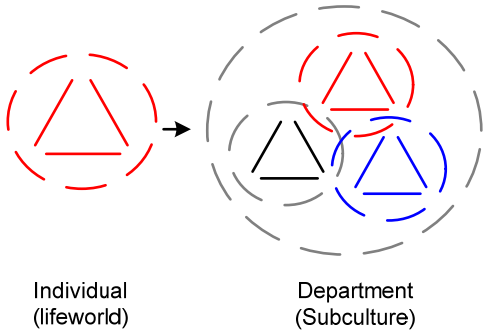

Figure 19 The use of lifeworlds to gain access to subcultures. The arrow indicates the methodical approach, not a theoretical.

The individuals in the subcultures have similarities. The similarities can be described by what Dixon calls collective meaning structures. Collective meaning structures are the part of the individuals meaning which is held jointly by all members of a subculture. The collective meaning structures are created in the dialogue between the employees. In the process where the employees articulate their meaning and discuss it with the others, finding differences and similarities, the employees alter the meaning they hold. (Dixon, 1999)

As an example, a dialogue between the environmental coordinators, where discussions about the practices of applying the questionnaire take place, could have an influence on the meanings that the coordinators hold.

In the organisation learning processes related to new initiatives the integration of new knowledge is followed by a collective interpretation. Collective interpretation is by Dixon (1999) defined as the "*interaction among organisational members in order to reduce the equivocality of information*". The goal with collective interpretation is not to reach consensus but that each of the employees understands the reasoning behind others meanings. Finally, when they understand others meanings they can compare their own meanings leading to a more full understanding. The collective interpretation process is necessary for making decisions to act. The more the collective meaning structures differ, the more difficult it is to create a shared engagement to fulfil the decided actions.

In order for the organisational learning to be initiated new inputs are needed, for example by interaction with people outside the subculture. The interactions between the boundaries of subcultures are introduced in the following section.

5.14 Translation processes – exploring boundaries of subcultures

The theory presented in the previous chapter has limited focus on the interaction and translation processes between subcultures, in other words how subcultures develop in interaction with other subcultures.

This section has the purpose of introducing the concepts that are applied to analyse the interaction between boundaries of subcultures. More explicitly the goal is to investigate the interactions with other departments/subcultures and how this alters the subcultures through organisational learning.

In the following section it is chosen to develop a framework for analysing the interactions and translation processes between departments in Elsam, taking point of departure in brokering. The concepts are based on Etienne Wengers theory of "communities of practice" especially with focus on boundaries of communities of practices and their mutual interaction.

A community of practice is related to the process of social learning that occurs and shared practices that emerge, when people with common goals interact and strive towards those goals (Wenger, 1999). A subculture, as the concept is applied in this thesis, is a group of people with shared meaning structures, more specifically their expressions indicate coherence between their lifeworlds. A subculture is a cultural subgroup in the organisation. They have differences but can also have similarities with the rest of the organisation.

Communities of practices are not addressed in this thesis besides the adoption of the concepts of brokering: brokers and boundary objects, that supplements the theoretical framework in adding translation processes between the subcultures.

5.14.1 Brokering

Subcultures have boundaries that define who are members and who are not. Within an organisation there can be several subcultures and, if their meaning structures differ significantly, translation processes and collective interpretation is needed for the subcultures to collaborate. One way of crossing the boundaries between subcultures is by brokering. For brokering to occur two things are needed; brokers and boundary objects. (Inspired by Wenger, 1999)

A boundary object is shared between subcultures. The boundary object enables the establishment of a common reference point that will enable the interaction between the subcultures to take place. (Inspired by Wenger, 1999)

Wenger (1999) defines brokering as the process that "*introduces elements from one practice to another*". Some individuals in one subculture take on the role of brokers and make connections to other subcultures. Thereby they translate knowledge from one subculture to another. The result of the brokering process is a change in the way each subculture defines its own identity and practice. In the following the concepts of brokers and boundary objects are further introduced.

Brokers

Brokers are outsiders to the subculture but they have the skills to enter them and present new ideas and practices developed in another subculture, and thereby engage in boundary encounters. The goal is that the boundary object is translated into the meaning structures in the subculture through an organisational learning process.

In the work practices one could imagine numerous boundary objects being applied to link the work of different subcultures with environmental focus. These could for example be workshops, staff meetings and newsletters. Developing effective boundary objects is a real skill. (Inspired by Wenger, 1999)

Skilled brokers are necessary for success of the boundary encounter as they need to be on both sides of different communities of practice and assist the exchange process. Brokers have to both facilitate establishment of new connections between the subcultures and enable the interaction and open possibilities for the establishment of what Dixon (1999) calls collective meaning structures which developed through organisational learning processes. (Wenger, 1999)

In the role of brokering, two opposite tendencies have to be avoided: becoming a full member of the "new" subculture and being rejected as an intruder. (Wenger, 1999)

Boundary objects

A boundary object is a common point of reference for interaction between subcultures. The members of the different cultures agree that they are talking about the object, but they are not actually talking about the same thing as they attach different meanings to the object. An example from the case study is environmental policies that employees can relate to but also have different opinions about.

Boundary objects are applied as means of coordination and alignment e.g. aligning practices with policies. Despite the differences in interpretations by different subcultures, boundary objects serve as a means of translation. An example: When purchasers conduct green procurement, green procurement tools can be used to smooth the process of explanation, by examining the content of the tools more deeply.

As a result of the differences in interpretation of the boundary objects they both connect and disconnect the subcultures. They make it possible to coordinate but without actually making consensus between the interpretations and meanings of the different subcultures.

Wenger (1999) presents three categories of boundary objects. The examples given for each category are chosen to fit the terminology of this thesis:

- **Artefacts**: tools, documents, system shared by the subcultures.
- **Common language** that can be shared across subcultures.
- **Shared practices** that facilitate interaction between subcultures.

When a boundary object serves several subcultures, each of them has only a part of the control of the establishment of meanings associated with the object. (Wenger, 1999) An example is a green procurement tool: The environmental department determines the design of the tool but the purchasers determine what it comes to mean to them and how it is implemented.

The design of artefacts for green procurement, e.g. procedures and tools, is often the design of a boundary object. The crucial issue is the relationship between the practices of those that construct the artefacts and those that interpret and integrate them. This calls for communication. (Inspired by Wenger, 1999)

5.15 Conclusion

Reality is constructed by integrating the four key dimensions: facts, logic, values and communication. (Henriksen et al., 2004) In this chapter, parts of the model presented in figure 15, have been altered. The main changes are that the concept of facts is revised to practice and artefacts, the term logic is replaced with reasoning and finally it is stressed that communication is the means to construct and deconstruct the social reality. Thereby the lifeworld is created and altered (socially constructed).

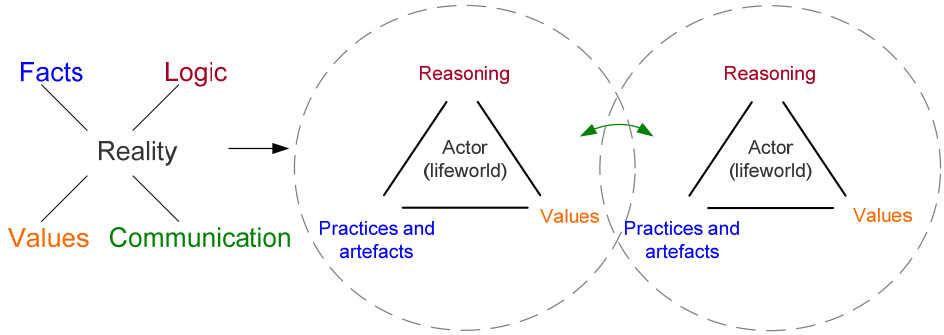

Figure 20 The perception of reality from Henriksen (2004) and the changes made in order to make it appropriate for this thesis.

In this thesis this theory is applied in the analyses of the individual lifeworlds and in identifying the collective meaning structures in the subcultures.

The theory described above has been supplemented with concepts related to translation processes, namely brokering, to analyse the interaction and translation between subcultures.

The use of individual lifeworlds in order to understand the subcultures is illustrated in figure 21. Likewise the interaction and translation processes between the subcultures are illustrated. This interaction leads to development of collective meaning structures and thereby alters the subcultures.

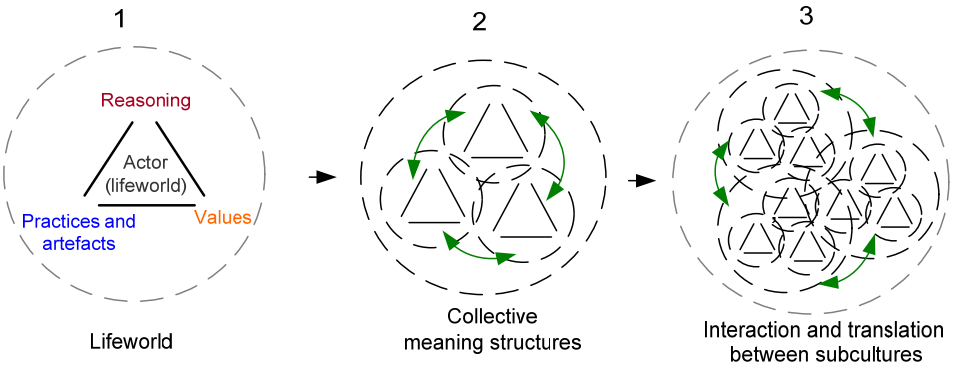

Figure 21 The use of individual lifeworlds, subcultures at power plant level and the interaction between subcultures. 1: Analysing lifeworld. 2: Using similarities in lifeworlds to describe collective meaning structures within departments (subcultures). 3: Exploring boundary interaction between subcultures. The black arrows indicate the steps in the theoretical development.

The theory of organisational reality is applied for the elements 1 and 2 in figure 21, and in the empirical analyses in chapters 8-12. The translation processes are primarily applied in the analyses in chapter 13 that deal with the interaction between departments in Elsam.

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6 Presentation of Elsam

This chapter introduces the case-organisation Elsam. Firstly a general introduction to Elsam and its business areas is given; afterwards focus is on Elsam's environmental effort, especially the organisation of the environmental supplier communication in Elsam.

In June 2006 Elsam merged with E2 and Dong. The empirical material was collected before the merge. In order to understand the results of the survey it is necessary to understand the organisational structure and relevant policies and procedures at that time.

Section 14.7 introduces some perspectives relating to the merge and the results of this thesis.

6.1 Introduction

Elsam is a Danish energy organisation with activities both in Denmark and abroad. The primary business area is to sell power and heat in Denmark. Elsam builds, owns and operates power plants and combined heat and power generating plants as well as distribution grids in Denmark (Elsam, 2004). Besides this, Elsam also focuses on consultancy within sustainable energy technologies. On average the organisation employed 2,222 persons in 2004. (Elsam, 2005)

Elsam produces half of the Danish electricity, which is a reduction compared to earlier years. Local combined heat and power plants, waste incineration and plants using biomass as fuel have taken over a part of the market from the centralised power plants. (Østergaard, 2006)

Elsam's concepts and aims:

- Elsam aims at being a growth-oriented and independent Danish organisation with an international outlook.
- Elsam aims at ensuring significant increase in shareholder value.
- Elsam aims at maintaining and strengthening its competitiveness and its market leadership by continuously developing its customer relations, employees and production methods.
- Elsam aims at focusing on efficient operation and innovation.
- Elsam aims at developing new, profitable business areas based on and supported by its core business.

(Elsam, 2004a)

The business in Elsam has changed since 1980 when they mainly consisted of seven power plants that produced the main part of the electricity used in Jutland. Later this changed with focus on production of combined heat and power. This means that Elsam has lost a large share of the electricity market in Denmark. Besides this their production has also been decentralised. The status in 2004 is that Elsam runs both lokal CHP plants (combined heat and power plants) and approx 500 Wind turbines. (Nielsen and Raun, 2004). In figure 22 the development in the distribution of power production units in Denmark is illustrated.

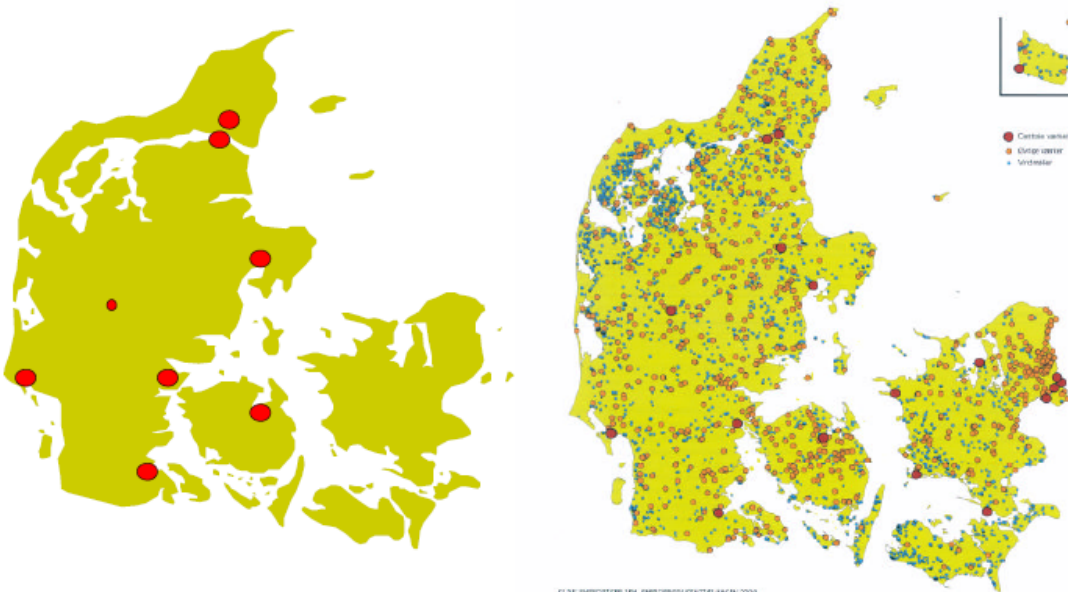

Figure 22 The development in distribution of power production units in Denmark from 1980 to 1995. The large red dots are central power plants, the smaller orange dots are other plants and the blue dots represents windmills. (Nielsen and Raun, 2004)

Because of the liberalisation of the electricity market Elsam has gone from being a partnership of almost independent power plants, which mainly focused on security of supply, to an actual group of companies (a concern). (Nielsen and Raun, 2004)

6.2 Organisational structure and activities

Elsam has a number of subsidiary companies. The primary ones are; Elsam Kraft, Nesa, Elsam Engineering and a number of waste fired CHP plants. These subsidiary companies are presented in figure 23.

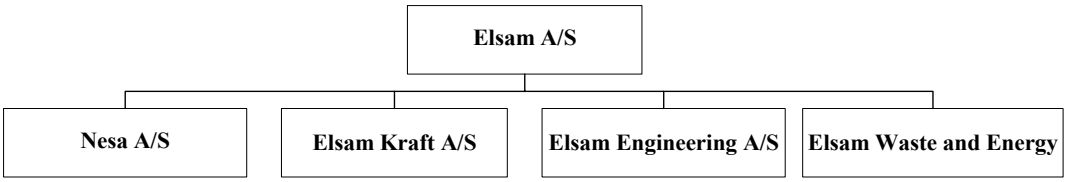

Figure 23 Elsam and its subsidiary companies.

Elsam Kraft A/S produces power and heat and is the largest producer in Denmark. The main part of the production is made at seven centralized combined heat and power plants. In addition there is a number of local combined heat and power stations and approx 500 wind turbines, including the offshore wind farm at Horns Rev. Elsam Kraft A/S has around 1000 employees. (Elsam, 2004)

The Nesa Group became an organisation within the Elsam Group on the 1st April 2004. They have activities within, but not limited to, power trade, power distribution and transmission. The Nesa grid provides more than one million people with power in the suburban municipalities of Copenhagen, North Zealand and the municipalities around Roskilde. Nesa has approx 800 employees. The largest shareholders are Elsam with an 86.4 % share. (Elsam, 2004)

Elsam Waste and Energy has activities within waste incineration. The waste incineration takes place at 6 combined heat and power plants. Based on the "Electricity Supply Act" the waste-fired CHP plants are to be self-supporting from 1st January 2000. This is the primary reason for them to be organised as independent companies. The waste-fired plants which are united in Elsam incinerate approx 20 % of the combustible waste delivered to waste incineration plants in Denmark. (Elsam, 2004)

Elsam Engineering is the technological knowledge centre of the Elsam Group. Their main task is to maintain and develop Elsams knowledge and competences in order to ensure efficient energy production at the production facilities of the Elsam Group. Besides this Elsam Engineering assists the Elsam Group in carrying out research and development activities. They have various consultancy activities within the energy and environmental sectors both in Denmark and abroad. Elsam engineering has nearly 300 employees. (Elsam, 2004)

6.3 Elsam and the environment

Elsam's main environmental impacts are related to the combustion of fossil fuels. In 1980 the production of electricity in Elsam was primarily based on combustion of coal and oil. This has continually been reduced and the use of alternative fuels has increased. This is illustrated in figure 24.

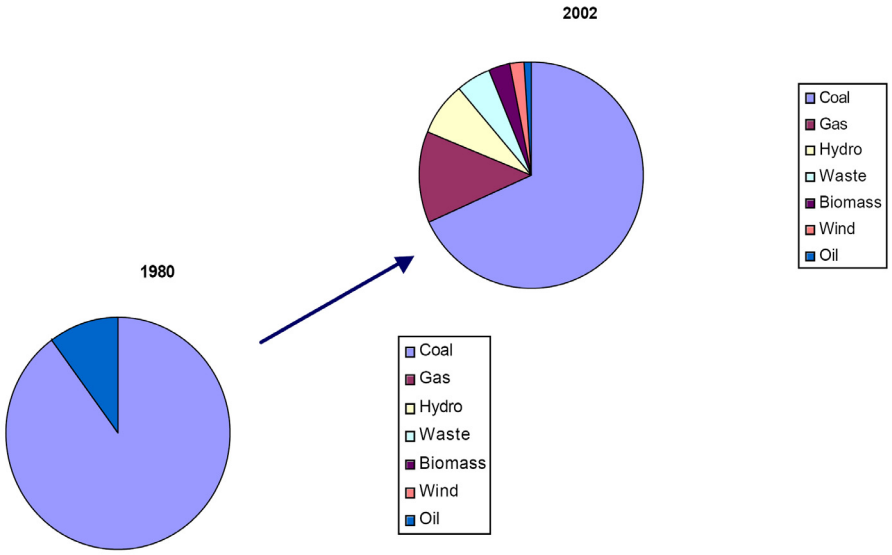

Figure 24 The development in the use of fuels for electricity production in Elsam from 1980 to 2002. (Nielsen, 2004)

The increased use of alternative fuels and the technology advances in the incineration processes has reduced the emissions from the production of heat and electricity. An example; the CO2 emissions have been reduced by 20% since 1997 and the NOx emission by 60%. (Nielsen and Raun, 2004)

In their environmental management system Elsam has specified the following areas as their most important environmental and occupational health and safety impacts; fuel (choice of fuel), water consumption, chemicals, emissions to air, waste water, waste, residual products, local environmental impacts and local impacts on occupational health and safety. (Elsam, 2004) The indirect environmental impacts are not included in this list even though it has been addressed in the ISO 14001 standard since the revision of the standard in 2001. (ISO, 2001)

6.3.1 Certifications and environmental policies

Since 2002 Elsam has been certified according to ISO 14001 and in 2004 they were also certified according to OHSAS 18001.

Elsam's environmental policy:

As an extension of our business concept and values we will:

- Work preventively and targeted towards reducing the impacts of our production on environment, on our employees and on the surrounding society.
- Involve, motivate and train employees in the daily environmental and occupational health and safety efforts.
- Incorporate sustainability in research, development, planning and investment in new activities.
- Observe and take the lead of both environmental and occupational health and safety legislation and of local environmental regulation.
- Encourage suppliers to incorporate environmental and occupational health and safety systems for production and products.
- Communicate openly with customers, authorities and the community on our work with sustainability, including environmental and occupational health and safety relations.

(Elsam, 2004a)

6.3.2 Continuous improvements in environmental effort

The main goals and targets in the environmental management system are developed in EKM (Danish abbreviation for Elsam Group Environment).

The power plants develop their own environmental targets each year and send them to EKM for approval. EKM then include these improvement targets in the collective targets made for Elsam each year. In principle the targets made at the power plants are controlled by the environmental policy in Elsam but in practice the power plants are relatively free to address the areas they find most important. (Raun, 2004)

6.3.3 Sustainability

Elsam has made a brand related to their effort in the environmental arena. This brand is called "Essential Energy". Elsam mainly combusts fossil fuels, this makes it difficult to operate with the term "sustainability". Therefore Elsam has developed the "Essential Energy" concept, as a way to illustrate how Elsam works relating to the different aspects of sustainability, the concept is illustrated in figure 25. This is a way to illustrate the relative improvements and not focus on the absolute impacts. (Nielsen and Raun, 2004)

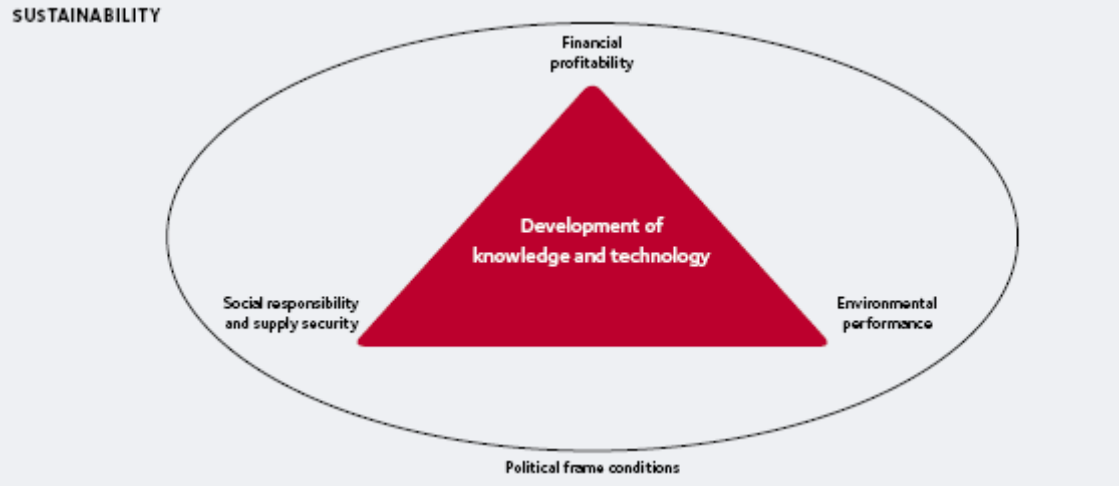

Figure 25 Sustainability and Elsam; How they interpret the concept. (Elsam, 2004a)

Environmental performance: Elsam is continually reducing the environmental impacts by e.g. improving the production technologies, reducing emissions and increasing the use of renewable energy (wind, waste, straw and wood). (Nielsen and Raun, 2004)

Financial profitability: Elsam values financial profitability and as they state in their concepts and aims that they aim at ensuring significant increase in value for the shareholders (Elsam, 2004a). Historically their high efficiency in the electricity production at the power plants has been their primary basis of competition. (Nielsen and Raun, 2004)

Social responsibility and supply security: Relating to social issues the primary focus has been on occupational health and safety at the power plants. In the latest years they have also focused on social issues in a product chain perspective both by communicating with suppliers and making costumer and financial surveys to map the social interests in Elsams product chain. Supply security has always been one of Elsam's primary success criteria. (Nielsen and Raun, 2004)

Development of knowledge and technology: Elsam has one of its main forces in technology relating to combustion of coal. Lately they have also focused on development of technologies for renewable energy and have both national and international projects with waste incineration and combustion of wood and straw. (Mehlsen, 2007)

6.3.4 Organisation

Elsams' environmental organisation is divided into two levels. Elsam engineering has an environmental and quality department with 12 employees (Iversen, 2006). Internally the central environmental department is called "Elsam Group Environment" (the Danish abbreviation EKM is used in the following). There are also environmental coordinators situated at the power plants. (Nielsen and Raun, 2004)

The central department works as an executive function from where the power plants can buy services. Besides this function as a consultancy department they also develop the environmental report each year and collaborate with different parts of the organisation in relation to larger environmental projects, e.g. making environmental assessments of the modernisation of new plants or construction of new ones. EKM also updates and maintains the environmental management system and makes sure that the certification of the management system is in place. They collect data from the power plants, and use these data to develop action plans for the environmental effort each year. The preparation of green accounts for the power plants is also coordinated by the central department and they collect data for consumption and emissions from the plants. (Nielsen and Raun, 2004)

The local environmental departments maintain the local environmental management systems and the daily environmental effort at the plants. This also includes contact with local authorities, measurement of, for example, emissions and collection of data for the preparation of the green accounts. (Nielsen and Raun, 2004)

The local environmental coordinators have a group where they exchange experiences and discuss new initiatives called the AMSG group. (A Danish abbreviation for "Occupational health and safety and environmental steering group")

6.4 Conclusion

Since the 1980'es Elsam has expanded their focus from combustion of fossil fuels, especially coal and oil, to development and implementation of technologies for combustion of a number of renewable energy sources, as well as other alternative energy sources such as wind and hydro. With the merge of the power plant in 2000, and a liberalisation of the electricity market, environmental management came into focus in the organisation and today all central power plants are certified according to ISO 14001.

Elsam has a proactive environmental policy and works with the concept of "essential energy" including environmental, social and economical aspects in a product chain perspective.

One of the initiatives in Elsam's environmental effort is green procurement, and this issue is addressed in the following chapter.

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7 Green procurement in Elsam

The purpose of this chapter is to introduce the organisation of procurement in Elsam and discuss the green procurement procedure as well as the questionnaires applied in the green procurement. Firstly the departments that are responsible for the procurement are introduced, then the background for green procurement is given and the actual green procurement procedure. Lastly the content of the environmental questionnaire for the suppliers is discussed.

7.1 The background for green procurement

Elsam's environmental communication with the suppliers is based on the "essential energy" concept described in the previous chapter. An environmental policy was made in connection with the implementation and certification of environmental management according to ISO 14001 in 2002 and OHSAS 18001 in 2004. The policy contains elements of relevance for green procurement in Elsam. The policy is introduced in the previous chapter and therefore the part of the statement presented here is related to suppliers:

As an extension of our business concept and values we will:

- *"Encourage suppliers to incorporate environmental and occupational health and safety systems for production and products"*. (Elsam, 2004)
- "*Involve, motivate and train the employees in the daily work with environment and health and safety*". (Elsam, 2004)

The first bullet point forms the incentive for implementing green procurement, and the second one forms a basis for involving the employees in the process. The policy results in a number of procedures that are applied in the green procurement practices in Elsam, the most commonly used procedure is presented later in this chapter. The overall procedures for green procurement are developed centrally and placed in the central environmental handbook. Goals and action plans for the implementation of environmental improvements are developed locally. This is further described in the following sections.

In the annual report from 2002 is stated that:

"*Elsam will influence the suppliers in an environmental friendly direction. This is done by informing about Elsam's environmental policy and by encouraging the suppliers to consider environmental issues in the supply of raw-materials, products and services*." (Elsam, 2003)

In 2003 and 2004, green procurement was not addressed separately in the annual reports besides from the content in the environmental policy described above.

One argument for green procurement is based on Elsam's ISO 14001 certification. In the ISO 14001 (2001) standard there is a demand for establishing procedures to control the significant environmental aspects of goods and services provided by suppliers (Indirect environmental aspects). This is addressed in Elsam's environmental policy as described earlier.

The environmental management handbook states that the explicit reasons for implementing a procedure for green procurement are:

- Generate knowledge of the environmental impacts from products and services.
- Mutual dialogue in preparation for minimizing environmental and health and safety impacts.
- Provide an overview of the suppliers' awareness of environmental and health and safety issues. (Elsam, 2006a)

Thereby, Elsam has specified three reasons for implementing green procurement. The first is to gain knowledge of the environmental impacts from products and services, which is a product oriented goal that asks for life cycle considerations and/or life cycle data on products. The second goal is dialogue (collaboration) that leads to minimised environmental impacts and the last goal is to gain an overview of the supplier's awareness in the environmental field.

7.2 The organisation of procurement

Elsam is a large organisation and its purchasers are distributed throughout the organisation. Three kinds of purchasers are associated with the power plants; the central purchasers, the local purchasers and the employees in general (As everyone in Elsam is allowed to buy products). This is illustrated in figure 26.

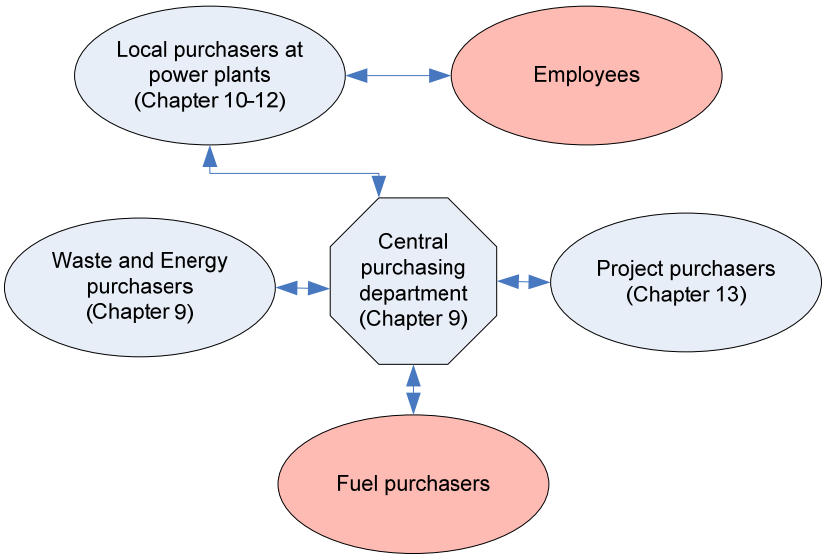

Figure 26 Purchasers in Elsam based on information from interviews. The blue arrows illustrate the communication lines. The purchasers in red circles are not included in the study.

The departments that purchase fuels for the power production are neither included in the following description nor in the analysis in the following chapters. They do not use the same green procurement procedure as the other departments, and generally face different challenges than the other purchasers because of the products and markets they operate in. The employees at the power plants are only included indirectly as the other purchasing departments discuss their communication with the employees.

The project managers are also project-purchasers in the larger projects in Elsam, for example construction of new power plants. These project-purchasers are included in the descriptions, as they have experiences with applying the procedure for green procurement.

7.2.1 The central purchasing department

Two full-time employees in the purchasing department are responsible for the development of central purchasing agreements. These agreements include procurement of both products and services. (Christensen, 2005) The motivation for the establishment of the central purchasing department was to realise the economic benefits from purchasing in greater volumes. Therefore, economy has been the primary criteria for selecting areas for purchasing agreements, and there are more than 100 agreements. If purchasers in Elsam exceed a limit of 3-5 million DKK and they are not included in the purchasing agreements the central purchasing department is involved in the procurement process.

As a part of the development of purchasing agreements the department makes individual evaluations of quality, economical and environmental aspects of the suppliers and their products. Regarding the environmental demands they send a questionnaire to the suppliers who fill it out, sign it and return it to the purchaser. Purchasing agreements can only be made if the supplier, as a minimum, complies with Danish environmental regulations. However, other questions are asked as well, see section 7.3.1. The suppliers do not get a response based on the environmental approval besides a general notification of whether they were approved or not. The suppliers are not directly informed whether they were approved or rejected based environmental demands. (Raun, 2005)

7.3 Environmental demands in local purchasing

A green procurement procedure has been developed for the local purchasers. All employees at the power plants are in principle "a purchaser" as they can all buy products and services. There is a purchasing department that handles the practicalities and bookkeeping and also the main part of the actual purchase.

The environmental assessment procedure consists of several steps that are described in the flowchart in figure 27.

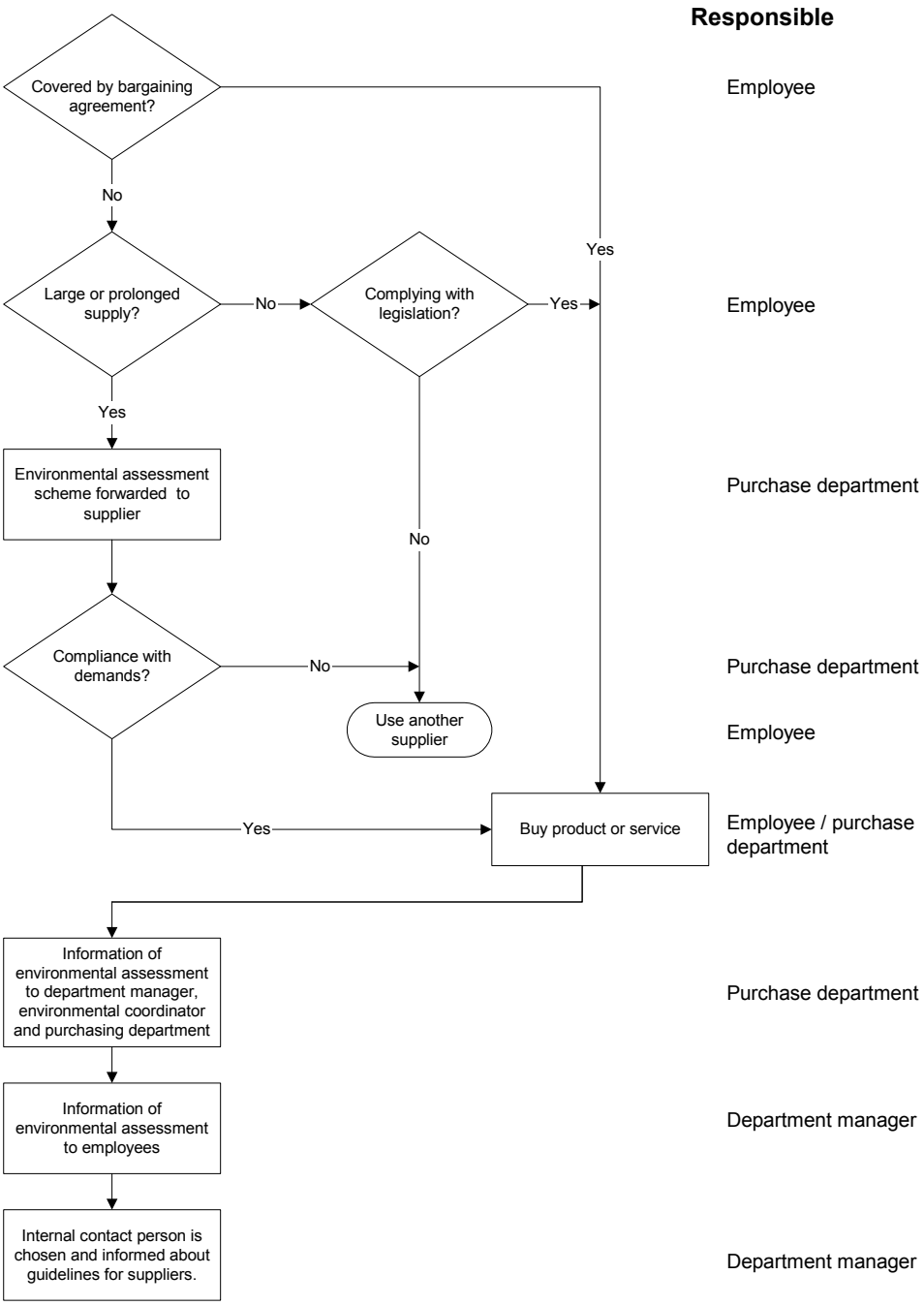

Figure 27 The procedure for evaluating suppliers of products and services (Inspired by Elsam, 2005b)

As a part of the procedure an environmental assessment scheme is sent to the suppliers see section 7.3.1.

The goal is that all local suppliers are environmentally approved before Elsam buys products or services from them. This approval is registered in the internal purchasing system. This secures that each local supplier for the power plant is only evaluated once, and not each time an employee considers buying a new product.

A set of guidelines relating to health and service issues is developed for suppliers of services. The last "action" in the flowchart relates to this process, as each supplier is assigned to an internal contact person, who is responsible for distributing the information.

7.3.1 The environmental assessment schemes

The basis for environmental communication with the suppliers is an 8 page folder that introduces Elsam's environmental effort and contains a questionnaire for the suppliers.

Two environmental assessment schemes are applied when purchasing products and services: one for suppliers of products and one for suppliers of services (they are referred to in the procedure in figure 27).

Environmental assessment scheme for products

The environmental assessment scheme is sent to the supplier together with a brochure that introduces Elsam's environmental policy and related subjects concerning Elsam's environmental efforts. Included in the brochure is also a text that gives motivation for the questions and explains why they are of importance to Elsam. As a part of this brochure Elsam has answered the questions themselves to show their environmental profile. (Elsam, 2006b)

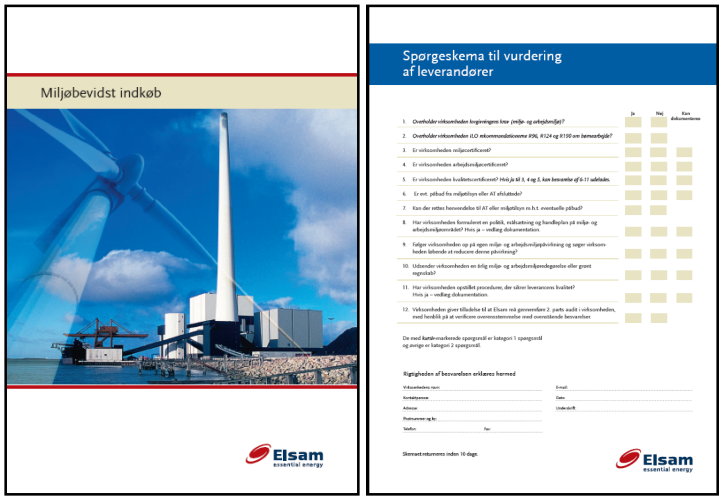

Illustration: Environmental assessment scheme for local suppliers (Elsam, 2006c)

The assessment scheme focuses on health and safety issues. This can be explained by the fact that Elsam historically has had a high rate of occupational injuries. Below the questionnaire is presented together with an assessment of the purpose of each question based on Raun (2004) and Elsam (2006b).

Question	Argument for question
1. Does the company comply with the Danish legislation relating to environment and health and safety?	Demand in ISO 14001, image
2. Can the Danish Working Environment Service be contacted regarding potential injunctions?	Demand in ISO 14001, image
3. Does the company comply with the ILO recommendations R96, R124 and R190 relating to child labour.	Image
4. Has the company a certified environmental management system?	Secures continuous improvements
5. Has the company a certified health and safety management system?	Secures continuous improvements
6. Has the company a certified quality management system? (If positive answer to question 3-5, skip question 7-110)	Secures continuous improvements
7. Has the company formulated an environmental and health and safety policy with relating target and goals? (If yes, attach documentation)	Will to environmental consciousness
8. Is the company recording its environmental- and health and safety impacts, and is the company continually working with a reduction of these impacts?	Will to occupational health and safety consciousness
9. Is the company publishing an annual environmental and health and safety report or a green account?	Visibility of environmental information
10. Has the company outlined a procedure that secures the quality of deliverances?	Focus on accidents
11. Specify the company's accident frequency the last three years.	Focus on accidents
12. Does the company permit that Elsam can make a 2nd part audit in order to confirm the compliance with the answers given to the questions above?	Signals openness and honesty

Figure 28 Environmental assessment schemes for suppliers of products (Elsam, 2005b)

When the supplier returns the scheme the purchaser evaluates the answers. The supplier can only be used if the answers to questions 1-3 are yes. A scoring system is applied in order to evaluate the other questions. The supplier needs to answer positive to at least one of the questions 4-6 or two of question 7-11. The total score of each supplier is applied as a parameter. If more than one potential supplier complies with the demands, it is not specified how they should be prioritised. (Elsam 2005)

A supplier certified according to ISO 9001 (Quality) is approved even though they do not work with environmental management or occupational health and safety.

If a supplier does not have a certified management system but answers yes to having a procedure that secures the quality of deliverances and specifies their accident frequencies they may also be approved.

The total score of the questionnaire is used when choosing between potential suppliers. Thereby the suppliers that have both an environmental, quality and health and safety certification would have a higher priority than those that do not have these certifications.

Some of the local green procurement procedures have minor alterations relative to the descriptions above, but the questions and the scoring are similar.

The applied scheme in the environmental assessment of services has some additional questions related to the use of hazardous substances, but otherwise it is similar to the questionnaire.

7.4 Conclusion

From an environmental perspective green procurement has limited possibilities for improvements in the areas that Elsam specified as their most important in the environmental handbook, namely: Fuel (choice of fuel), water consumption, chemicals, emissions to air, waste water, waste, residual products, local environmental impacts and local impacts on occupational health and safety (Elsam, 2004).

If the green procurement is not based on improving the most significant environmental impacts in Elsam then what is the motivation? Some respondents say that it is based on a general wish to improve the organisational image, others that it is a demand in the ISO 14001 certification.

The procedure and environmental assessment scheme only relates to the in-situ (on the spot) environmental performance of the suppliers. It is not the product oriented approach that the company has committed itself to in the policy. An (minor) exception is the evaluation of the chemicals where health and safety issues are considered.

A possibility for a supplement is to build into the procedure, specifying that if the supplier indicated a deadline for compliance with the demands, that he can be approved anyhow. The local purchasers do not seem to apply this possibility in the procurement practices and thereby the aspect of the environmental policy relating to "*encouraging suppliers to incorporate environmental and occupational health and safety systems for production and products*" is not reached.

It could be discussed whether the three goals for green procurement in Elsam (described in 7.1) are reached with the procedure. First of all the questionnaire does not provide information about the environmental impacts from the products. The questions regarding frequencies of occupational injuries reveals some information of the health and safety impacts but only related to the primary supplier. The second goal is based on dialogue as a mean to minimise the environmental and health and safety impacts. The current procedure is based on written information exchange and there is no dialogue involved; therefore this goal is not reached either. The latter goal of providing an overview of the supplier's awareness of environmental and health and safety issues is reached to some extent, even though it can be argued that it is information about the procedures for environmental and health and safety management rather than the awareness that is disclosed through a questionnaire.

The following chapters show, none the less, that there are examples of green procurement in Elsam where a product oriented approach is taken and dialogue between purchasers and suppliers occurs. This is especially related to projects in a purchasing group that works with projects related to reducing the number of chemicals used at the power plants.

The central environmental department determines that the practices according to green procurement should be changed, and this leads to changes in the local departments. In this process unforeseen consequences can appear (Raun, 2004), which show that the implementation processes is not just a rational process. This is examined further in chapters 8-12.

One of the problems with this way of handling green procurement is how to secure credibility in the answers from the suppliers, especially when there is no follow-up on the answers and none of the interviewed purchasers indicated that they actually do perform supplier audits.

More and more services are outsourced in Elsam and this makes it more difficult to manage, for example the types of chemicals used at the plants, as the suppliers are only obliged to comply with Danish legislation and do not have to follow Elsams internal standards.

In the following chapters case-analyses are made in order to investigate how the green procurement procedures are implemented in practice, how the procedure is developed and what the actual practices are for green procurement in Elsam.

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8 Elsam Engineering

The purpose of this analysis of Elsam Engineering is to investigate the lifeworlds and subcultures related to the environmental efforts with focus on green procurement. In chapter 13 the results of this analysis are compared to the analysis of the power plants in order to identify potential barriers and drivers for the implementation of new environmental communication initiatives.

Firstly the departments in Elsam Engineering are presented especially with focus on their organisational and environmental profile. Secondly the environmental efforts at the departments are analysed from the perspective of:

- An environmental coordinator placed in Elsam Group Environment (EKM is the Danish abbreviation).
- The two employed in the central purchasing department.
- A regulatory coordinator situated in the Waste and Energy department.

After each section follows a short discussion of the findings related to the theory applied for the analysis. Finally, as a conclusion, the main characteristics of the organisational culture, related to the environmental effort in the department, are discussed.

The empirical knowledge for the analysis is based on the following material:

- Interview with the environmental coordinator, Helle Mose Iversen, June 2006
- Interviews with regulatory coordinator Frits Unold, June 2006
- Interview with purchasing manager, Erling Christian Carlsen, January 2007
- Interview with system coordinator Yrsa Thomsen Christensen, January 2007
- Brochure introducing Elsam and sustainability, 2006
- Illumination of purpose and background for Elsams supplier communication. Internal note, Elsam, 2004.
- Safety and Environmental handbook for EKM, Elsam 2007
- Agreements between craftsmen and contact persons relating to work done at Elsams Power Plants. Elsam, 2005
- Terms of reference for the storage purchasing group. Elsam 2005

Besides the material listed above, the analysis is inspired by general knowledge about Elsam, built up through 4 years of work with the innovation consortium in CEMIP. Through this period there has been a close collaboration with EKM and several stays in the central departments.

The quotes from the interviews are translated from Danish. The empirical data has not been updated since the merge in 2007 and the establishment of Dong Energy.

8.1 Organisational characteristics and environmental profile

There are 12 employees in the environment and quality department (EKM), most of them situated at Skærbækværket and the rest at different company locations in Denmark. EKM is part of Elsam Engineering which is a subsidiary organisation in Elsam. Among other tasks EKM workers update and develop the environmental management system in Elsam and they are consultants for the other departments in Elsam.

8.1.1 Environmental management system

EKM is not certified according to ISO 14001 but assists the other departments in Elsam to comply with the ISO14001 demands and maintain their certifications.

The environmental coordinator at EKM made following comment on this issue:
"*The power plants do not care whether we are certified, but relating to the image it is a problem*." (Iversen, 2006)

The rationale for this decision seems to be that "Elsam Engineering", that EKM is a part of, does not have significant environmental impacts themselves, but none the less they are consultants for the power plants and consultants on strategic projects in Elsam.

8.2 Environmental management department

Helle Iversen is the environmental coordinator and safety supervisor in EKM and she has been employed in Elsam since 1987. In 1987 she was employed at one of the large power plants as a mechanical engineer but over the years she worked more and more with environmental management and finally moved to a job in the headquarters with the environmental management system as her main responsibility.

EKM are consultants for all types of environmental efforts within Elsam. In "business development" EKM assists in making strategic long term decisions, where environmental issues are to be considered. When the project becomes more concrete the Project Department takes over, and EKM makes sure, among other things, that environmental impact assessments are made. There is also a Wind Department that controls the construction of windmill farms with help from EKM consultants. At power plant level smaller improvement projects are conducted and, when necessary, EKM assists with these as well. (Iversen, 2006)

8.2.1 Environmental understanding

The following section shows that the environmental coordinator focuses on a professional understanding of environmental issues, not surprisingly since she works with environmental issues on a daily basis. Helle Iversen defines environment as:

"*Environment is everything in our surroundings, and we have to take care of it to maintain life on earth, and the future generations*." (Iversen, 2006)

Asked whether environmental effort is important for Elsam she answers:

"*We are a polluting organisation and therefore it is important that we have an environmental management system and try to minimise the impacts we have on the surroundings. It is central for Elsam to work with environmental issues both because it is a part of the public debate but also because it has economic implications with e.g. CO_2 quotas*." (Iversen, 2006)

She explains that the most important impacts from Elsam are emissions, resource consumption, cooling water and waste water. She feels that the management's attitude towards prioritizing environmental issues is positive, the same goes for the rest of the employees at Elsam Engineering. On the other hand there are sometimes conflicting interests between for example economic, safety and environmental issues when making decisions.

Asked whether there is the same attitude towards environmental efforts at the power plants and in Elsam Engineering, Helle Iversen answers:

"*The attitude does not differ, but there are some organisational cultural differences. We have to work with that. (..) The attitude towards making environmental evaluations whether it is at project level or local level is mostly positive, but the culture in the departments differs and this influences how the environmental issues are handled*." (Iversen, 2006)

When talking about the local environmental improvement projects at the power plants she refers to them as "small", both when it comes to their potential for reducing the environmental impacts and their economic consequences. None the less, she is aware that they are of importance for affecting the environmental awareness at the plants. The "larger" projects based on strategic decisions are initiated in Elsam Engineering.

Asked whether the wide span between strategic decisions and concrete local improvement projects can be encompassed by the environmental policy she answers:

"*The environmental policy is very precise when it comes to working with continuous improvements, compliance with the law and sustainable development. This is what they work with at the strategic level. There is a part concerning supplier communication we work with on a daily basis. I find the policy appropriate for our work*." (Iversen, 2006)

In a discussion of the possibility for setting product oriented demands for suppliers, Helle Iversen says:

"*We do not have any product oriented demands for the suppliers but focus on the questionnaire already developed; we make audits to secure the appliance of that questionnaire. There are some examples e.g. computer monitors for the IT department, where they considered working environment and electricity use as well. That was a good project*." (Iversen, 2006)

Hereby Helle focuses on compliance with the policy and the goals and targets for the organisation as she works with the environmental management system, but she is aware that there is a potential for working more product oriented.

In the central environmental department a product oriented approach was introduced by a previous environmental manager: the Essential Energy concept. However the work has stagnated since he left the position as the work related to the essential energy concept depended on him acting as a catalyst for the process.

Summary related to theoretical framework

The environmental policy and the management system are important *artefacts* in the environmental effort in Elsam. The policy is accepted and known by the employees and seems to be a guideline in developing new environmental initiatives. The management system is applied as a way to keep track of the environmental effort and the procedures are actively used.

Setting environmental demands for suppliers at all levels of the organisation is an important *practice* in order to positively affect the surroundings.

The reasoning behind the environmental *practices* is that since Elsam is a polluting organisation it is important to work with a reduction of the environmental impacts. The focus on "in situ" environmental demands might be caused by the fact that the present environmental efforts are still "new" to many of the employees and it is difficult to broaden the scope even more. The *values* related to complying with the environmental policy are positive amongst the employees in Elsam Engineering. The environmental projects at the power plants are small but the environmental coordinator reasons that they are important in order to have a positive influence on the environmental awareness at the power plants.

Elsam Engineering employees work as consultants for the other departments. They thereby have an important *communication* task both related to introducing new initiatives and assisting in environmental projects. They also have a role in collecting experiences from the power plants, but it seems that this role is not focused on.

8.2.2 Momentum in environmental activities

The following is focused on the implementation of the green procurement procedure. It shows that EKM collaborates frequently with the power plants.

Asked whether the environmental effort in Elsam has lead to real changes in relation to procurement, Helle Iversen answers:

"*We started working with environmental management in 2000 and that really changed the behaviour at the power plants. Today they can not just accept products from the salesmen that knock on their door. They have to run the new products through the occupational health and safety group first*." (Iversen, 2006)

EKM are both consultants and co-ordinators of the environmental effort in Elsam, and one of the communication channels to the power plants is the AMSG group (A Danish abbreviation for "Occupational health and safety and environmental steering group").

"*We often collaborate with AMSG and thereby with the power plants, as the local environmental coordinators are part of the group, and we have scheduled meetings every other month. We actually often communicate with the local environmental coordinators but seldom with the purchasers*." (Iversen, 2006)

She finds that it is important to collaborate closely with the power plants to secure that they meet their environmental goals because EKM has a lot of knowledge that the plants can benefit from. She mentions one area for improvements related to green procurement.

"*I think that we ought to help the purchasing group more when they have projects concerning e.g. chemicals, paints and detergents*." (Iversen, 2006)

Helle Iversen finds that the purchasing group should ask for help when necessary, but on the other hand EKM could have a more active role in the collaboration.

Most of the employees both at the power plants and in EKM have worked in Elsam for a long time and this is positive for the communication between different departments:

"*It is positive that we all know each other through several years and the purchasers know that we know the organisation from the inside as well*." (Iversen, 2006)

It can be both a driver and a barrier for the communication and implementation of new initiatives that the purchasers and the environmental department have known each other for a long time. On the positive side is the understandings and knowledge about the organisation that they share. On the negative side the established expectations for the collaborations and each others roles in the organisation might be a hindrance for implementing changes.

Summary related to theoretical framework

The implementation of the environmental management system in Elsam is an important *fact* for a positive attitude towards the environmental effort. EKM often *communicates* with the environmental coordinators at the plant, both in predetermined meetings in the AMSG group and through ad-hoc communication. In the interview the information and help that EKM can give to the power plants was stressed, however it should be considered that the power plants can be an important source of information as well. As EKM employees work as consultants they get more or less decoupled from the information exchange. EKM could play a more active role in initiating and being investigative in their *communication* with the purchasers, but for now it is the purchasing group's responsibility to contact EKM. Helle Iversen *reasons* that it is easier to communicate with those employees that have been in Elsam for several years as they know the organisation thoroughly. On the other hand this can also be an obstacle for developing new roles in the collaboration.

8.2.3 Green procurement

The following shows that Helle Iversen finds that even though the green procurement procedure complies with the environmental policy, there is still room for improvements.

According to Raun (2004) it was not easy to agree upon the content of the procurement procedure. Helle is asked how the green procurement procedure was developed.

"*They began before I was hired here, but I participated in the update where we decided to include environment and quality. It has been some tough discussions, also when it comes to what it is legal to set demands for. We ended up with the lowest common denominator when it comes to what is acceptable in the organisation*." (Iversen, 2006)

Asked why they ended op with the lowest common denominator she answered:

"*There are so many that are interested in this issue in the organisation, and both the central purchasers, project purchase and the power plant uses the same questionnaire, and that makes it difficult*." (Iversen, 2006)

Even though the procedure is not as ambitious as it could have been, the actual implementation in the organisation is positive:

"*We communicate with the suppliers on different levels. We try to purchase 80% through the central purchasing agreements. The suppliers that are not included by the purchasing agreements are handled locally and thereby also handled differently. The important suppliers are included in the central purchasing agreements*." (Iversen, 2006)

Besides EKM several other actors participated in the development of the green procurement procedure:

"*The central purchasing manager participated in the development of it, and he applied it centrally. Then he meets with a purchasing group from the power plants and it has been introduced and discussed in that forum as well*." (Iversen, 2006)

The monitoring of whether the procedure is actually implemented in the purchasing practices goes through the environmental management audits:

"*At least once a year I make audit at the central purchasing department to see how they implement the procedure in practice. At the power plants it is the audits they have, that control it*." (Iversen, 2006)

Helle does not think that the questionnaire leads to any real environmentally improvements at present:

"*We are in the beginning of a process to influence the suppliers; I do not se the results of this yet*." (Iversen, 2006)

None the less she does find that the environmental communication with the suppliers is important:

"*The more demands we set for the suppliers, the more they have to work with their own suppliers to fulfil the demands. It spreads out in that way."* (Iversen, 2006)

This dynamic product chain perspective is interesting, but it can be discussed whether the green procurement practices in Elsam, focusing on process oriented demands, actually have this effect. If the questions were product oriented the product chain dynamics would probably facilitate the product chain dynamics even more.

Summary related to theoretical framework

Audits are important *practices* to secure implementation of green procurement procedures. However, Helle Iversen *reasons* that since so many have conflicting interests in the green procurement and because it was decided to make one common procedure, they ended up with a formulation that shows the lowest common denominator of these interests, as this is what they agreed upon.

The content of the green procurement procedure is a *fact* that shows the content of the green procurement in Elsam. There is not included any product oriented demands for the suppliers e.g. asking for products complying with the demands for environmental labelling or life cycle consideration related to energy usage.

The *communication* leading to the implementation of the procedure has gone through the central purchasing department. The *communication* with the suppliers has not lead to actual environmental improvements, but Helle Iversen believes that this will happen over time. In order for this to happen there ought to be a more process oriented approach to green procurement. One way of doing this is to make guidelines for environmental action plans for those suppliers that do not meet Elsams environmental demands; in that way those companies would be motivated to implement a product oriented environmental effort.

8.2.4 Summary related to theoretical framework

In table 16 a summary of the findings related to the lifeworld of the environmental coordinator is presented.

Theoretical concept	Lifeworld of environmental coordinator in the Environmental department at EKM
Emphasised practices	▪ Setting environmental demands for suppliers at all levels is an important *practice* in order to affect the surroundings positively. ▪ Implementation of the environmental management system in Elsam is an important practice to secure the positive attitude towards environmental effort. ▪ Audits are important *practices* to secure implementation of the green procurement procedures.
Important artefacts	▪ The environmental policy reflects the practices in Elsam. ▪ The wish for broad consensus about one green procurement procedure resulted in the least common denominator when it comes to environmental demands.
Reasoning	▪ Since Elsam is a polluting organisation it is important to work with a reduction of the impacts ▪ The environmental projects at the power plants are small but they are important in order to affect the culture at the plants in a positive direction.

Values	▪ A positive value amongst the employees in Elsam Engineering is compliance with the environmental policy. ▪ Since so many have an interest in the green procurement it is decided to make one common procedure. (The value is to have consensus)
Communication	▪ EKM often *communicates* with the environmental coordinators at the plant both in predetermined meetings in the AMSG group and ad-hoc based. ▪ EKM could play a more active role in initiating *communicating* with the purchasers as it is the purchasing group's responsibility to contact EKM. ▪ It is easier to communicate with those that know the organisation thoroughly and thereby those that have been in Elsam for several years ▪ The *communication* leading to implementation of the green procurement procedure has involved the central purchasing department. ▪ The *communication* with the suppliers has not lead to actual environmental improvements, but Helle Iversen believes that this will happen over time.

Table 16 Summary of findings from interview with the environmental coordinator at EKM.

8.3 Central purchasing department

In the central purchasing department there are two employees: a purchasing manager and a system coordinator. The department mainly works on making purchasing agreements for Elsam and assists in making tenders for larger projects managed by Elsam Engineering. They also manage the purchasing group and the purchasing software/systems in Elsam.

Purchasing manager Erling Carlsen is an engineer and has worked in Elsam for more than 40 years. He has been purchasing manager since the position was created in relation to the merge of the power plants in 2001. Previously he worked with project management and supervision related to the construction of new power plants. Today his primary task is the development of central purchasing agreements, assisting on larger tenders in Elsam and managing the purchasing group consisting of local purchasers in Elsam.

"*My task is to make purchasing agreements for the power plants and put them on the intranet. For each purchasing agreement we make an environmental assessment of the supplier. The purpose is that the employees use these agreements. If it is larger purchases 3-5 millions is the limit, then they contact me for assistance*. "(Carlsen, 2007)

Yrsa Christensen is system coordinator. She develops the central purchasing agreements and manages the software systems related to storage and purchasing in Elsam. She has worked in Elsam for more than 25 years, previously as a local purchaser, but since 2001 she has been seated in the central purchasing department.

The purpose with the central purchasing department is to make use of the synergy effects created in the merge of the power plants in 2001 as their purchasing capacity increases. Another purpose is to create a common set of rules for purchasing in Elsam that complies with the organisational policies.

8.3.1 Environmental understanding

Asked what the term environment means, the two respondents focuses on different aspects, Yrsa Christensen focuses on occupational health and safety:

"*Environment is everything in the outside world. Related to products, there should not be harmful substances in them, and it should be described what they contain. If it is services, then it is how the employees work and we do have strict safety instructions. These are also some of the things we ask for in the questionnaire*." (Christensen, 2007)

Erling Carlsen has another focus including both external environment and occupational health and safety:

"*Environment is our obligation to the world we live in, both related to nature and humans, how we act on a daily basis. This includes e.g. using resources in a proper way, reducing the amount of chemicals, human welfare and safety."* (Carlsen, 2007)

Asked what the main environmental activities in Elsam is, Erling Carlsen answers:

"*That we have made denox-plants and that we buy coal with a low content of sulphur. These huge investments are based on compliance with regulation*." (Carlsen, 2007)

Yrsa Christensen also finds that the emissions are important but supplements her definition with other areas that are of relevance for her daily work.

"*What we discharge is one of them, the social environment another and that we make sure that the suppliers play by our rules*." (Christensen, 2007)

Asked why Elsam considers environmental issues she answers:

"*Environment is important for Elsam. We discharge a lot of emissions and try to reduce that. We are also demanded to do a lot of things through regulation*." (Christensen, 2007)

They share the understanding that regulation is a driver for environmental effort and they both include external and internal environmental issues when describing the concept of environment and the initiatives of Elsam.

Summary related to theoretical framework

The purchasing manager and the system coordinator have similar understandings of the environmental initiatives in Elsam. This is not their primary area of responsibility but none the less they often work with environmental issues related to purchasing, as elaborated in the following sections. It is an important *fact*, that they both encompass external environment and occupational health and safety.

8.3.2 Momentum in environmental activities related to purchasing

The central purchasing department has a practical way of handling environmental efforts and relates it to market terms. From their point of view it is a necessary condition for an electricity producing organisation.

"*We do not work with environmental issues because we think that it is fun. It is something that is necessary to work with. We have to be able to document that both our consumption and waste products are handled in a proper manner. If we are to compete with others, the customers look at our practices. I remember that the municipalities demanded that we were environmentally certified, or else they would not buy electricity from us. We have to document that we behave in a proper manner.*" (Carlsen, 2007)

It is interesting but not surprising that they meet these demands as public purchasers are one of their main customers. Environmental issues being a competitive advantage can be an important driver for the environmental efforts.

How does the central purchasing group handle the green procurement? Besides making environmental assessments of the suppliers the purchasing manager participates in the supplier negotiations in large projects in Elsam.

"*I have an important role in the projects in Elsam Engineering where I participate in the final negotiations with the main suppliers. Some of the project managers resist this but being a god technician is not the same as being a good purchaser. As I do not know the suppliers, I can bargain more unbiased than they can*." (Carlsen, 2007)

Another aspect is the implementation of the supplier evaluation schemes locally at the power plants:

"*In the purchasing group we continuously discuss the environmental aspects of purchasing.(...) The purchasing group is my extended arm. They follow up on new initiatives, but they meet a lot of resistance at the plants*. " (Carlsen, 2007)

Erling Carlsen explains that the local purchasers participating in the purchasing group are positive towards the initiative. Yrsa Christensen explains the situation differently:

"*The power plants have been autonomous for many years and it is still the same employees. They do not see themselves as a part of the organisation yet.(...) We collaborate in the purchasing group and I tell them the advantages of the purchasing agreements but I can not force them to use the agreements*." (Christensen, 2007)

Both respondents describe the resistance it gives for collaboration, that the plants merged in 2001, and worked autonomous before that. Historically the power plants have not collaborated at all and suddenly they are supposed to use each others as colleagues by collaboration and exchange of experiences.

"*There used to be 7 independent world champions that did not want to discuss with the other power plants. Today it is different, but we still work toward changing the attitudes*." (Carlsen, 2007)

If the purchasers choose not to apply green procurement in their practices it has no consequences for them:

"*If the purchaser's action does not have any consequences then it will not change. The new employees are better at adjusting to the management systems and politics. The older employees do as they are used to*." (Carlsen, 2007)

This barrier is interesting as the centralisation of purchase, or at least centralisation due to the purchasing agreements, and the work done in the purchasing group counteract the tradition for limited collaboration between the power plants. Several of the purchasers interviewed at the power plant have, none the less, been positive towards the development; they have new colleagues and their jobs have been made easier by the purchasing agreements.

"*It is a bad signal to send to the suppliers if we do not follow up on the questionnaires they answer. We are considering making a centralised system where we can see whether all the local suppliers have an environmental approval in Elsam."* (Carlsen, 2007)

Erling Carlsen thereby finds, that one way of influencing the behaviour of the purchasers, is by controlling whether the local suppliers are environmentally approved.

Summary related to theoretical framework

The *communication* between the central purchasing department and the power plants are important to secure that the purchasing agreements are implemented locally. The arena for this collaboration is the purchasing group. The purchasing manager finds that the market demands set the agenda for the environmental effort in Elsam. The purchasing manger and the system coordinator *reasons* that the old culture established before the merge of the power plants influences the implementation of purchasing initiatives. Their *values* in the environmental area are related to being a good purchaser and meeting market demands.

8.3.3 Green procurement

When developing purchasing agreements tenders are made. The tenders mainly include demands for price, quality and environmental issues. The demands for price and quality are developed according to the single products but for the environmental issues the standardised questionnaire is applied. The environmental profile is assessed through a score chart and the suppliers should have a minimum score to be accepted as suppliers to Elsam. (Christensen, 2007) Thereby the demands for quality and price are product oriented whereas the demands for environmental issues focus on the policies and management systems of the supplier.

Asked why they set environmental demands for the suppliers Yrsa Christensen answers:

"*It is a natural part of tendering and a natural part of our daily work, that we actively encourage our suppliers to make environmental initiatives*." (Carlsen, 2007)

Erling Carlsen finds that the purchasing agreements are an appropriate tool for securing that the proper demands are set for the suppliers. He believes that the purchasing agreements should be used even more than they are today.

"*The goal is that 80% of our purchase or maybe more are made using the purchasing agreements*." (Carlsen, 2007)

Erling Carlsen sees the following arguments for the purchasers not to use the purchasing agreements:

"*Some purchasers want to support the local suppliers, and the central purchasing agreements as well as the environmental approval can be a barrier, which creates a negative attitude*." (Carlsen, 2007)

Yrsa Christensen sees the same problem when it comes to local suppliers:

”*The purchasers often forget to use the questionnaire for the local suppliers that they are used to apply*.” (Christensen, 2007)

Discussing whether the attitude towards applying the questionnaire has improved over time Erling Carlsen answers:

“*Some of the plants just do as they please, but it gets better and better. That goes for the purchasers. The blacksmith on the floor is also a mini-purchaser and he is hard to reach*.” (Carlsen, 2007)

Erling Carlsen thereby addresses one of the problems with setting restrictions on purchasing in Elsam, that everybody in principle is a purchaser, every employee can order the things they need. Yrsa Christen addresses the same issue:

“*We are a big organisation and it is hard to reach the single employee, especially when the communication is via the intranet. Then they have to be active to se the changes.(...) Some of the purchasers find the demands unnecessary and do as they please, others follow the procedures*.” (Christensen, 2007)

Yrsa Christensen explains the resistance towards using the purchasing agreements:

“*Using the bargaining agreements should make the purchasing job easier. They do not have to ask for price etc. It is not difficult to use the purchasing agreements, but they need to change their attitude towards them*.” (Christensen, 2007)

Seen from an environmental point of view the purchasing agreements are one way of securing that the suppliers comply with the environmental demands but it is questionable whether these demands actually make a difference.

“*The suppliers do improve their environmental performance, but for many of them it is totally new to meet these demands*.” (Carlsen, 2007)

Since Elsam has not always made these kinds of demands to their suppliers, some of the suppliers do not understand the purpose of the questionnaires and they contact the purchasers:

“*We are often contacted by suppliers that want to know if it is necessary to fill out the questionnaire, and sometimes we find that they answer questions that they do not understand. We need to make sure that the people who send out the questionnaire are properly introduced so they can help the suppliers*.” (Carlsen, 2007)

Asked for concrete results of applying the environmental demands, the purchasing manager gives the following examples:

"*The first time I sent an environmental questionnaire to Siemens they were uncomprehending. It is 3-4 years ago, but today most big suppliers are used to these demands. (…) We have a scaffold organisation that we use a lot, but they started working with environmental improvements because we told them that we wouldn't use them if they did not*." (Carlsen, 2007)

These situations where the suppliers change their practices to comply with Elsams demands have not been experienced by Yrsa Christensen:

"*If they want to be suppliers, but do not meet our demands, they could change their environmental performance, I do not know if anyone ever did so*." (Christensen, 2007)

On the other hand, the purchasing manager has the primary contact with the suppliers, whereas Yrsa Christensen works with the purchasing systems and the internal implementation.

The purchasing manager also has a strategic role in the development of larger tenders in Elsam, an area of the organisation where purchasers do not follow the environmental questionnaire applied in the green procurement practices.

"*I make the decision of what to set as demands in the larger tenders. An example is Xerox machines where we especially focused on energy consumption. Another example is transportation where we prioritised what kind of engines they have on their vehicles*."(Carlsen, 2007)

Thereby the project department actually sets product oriented environmental demands. Asked when they do so he answers:

"*It is especially in the larger tenders and projects that we set product oriented demands*." (Carlsen, 2007)

Yrsa Christensen also has some examples where they set this kind of demands:

"*We just made a purchasing agreement concerning clothing that is produced abroad. Then we considered working environment and chemicals but also how the clothes are to be cleaned. (…) When buying paper we asked for environmental labels and for detergents we looked at the ingredients, but this type of demands are coupled to projects in the purchasing group."* (Christensen, 2007)

Thereby product oriented demands are made in some of the large tenders in Elsam and likewise in the projects in the purchasing group working with.

Summary related to theoretical framework

When setting demands for quality and price in purchasing there is focus on the products. However, when setting environmental demands for the supplier they ask for the performance and policies of the supplier rather than the environmental impacts of the product. There is a *practice* for setting product oriented environmental demands in the larger tenders in Elsam. This is done by the purchasers and they do not include EKM in this process. Erling Carlsen has experienced suppliers that change their environmental *practices* as a result of demands from Elsam.

8.3.4 Summary related to theoretical framework

In table 17 is a summary of the findings related to the culture in the central purchasing department.

Theoretical concept	The Central Purchasing Department
Emphasised practices Important artefacts	▪ Product oriented demands are included in the larger tenders by the purchasers; EKM is not involved in this process. (Carlsen, 2006) (Christensen, 2006) ▪ They encompass external environment and occupational health and safety. ▪ Demands for quality and price are related to the products but environmental demands are related to processes and policies.
	▪ Some suppliers do change their practices due to demands from Elsam. (Carlsen, 2006)
Reasoning	▪ The purchasing manager finds that the market demands set the agenda for the environmental effort in Elsam. ▪ The power plants were autonomous before the liberalisation of the electricity market and the merge of the power plants. Therefore there are cultural barriers for the implementation of purchasing agreements. ▪ It is difficult to reach all purchasers in Elsam with new initiatives as all employees can purchase and the communication is distributed through updates in the management systems. ▪ A central control with the status on environmental approval of suppliers is one way of forcing the process. (Carlsen, 2006)
Values	▪ Being a good purchaser and meeting market demands. ▪ Green image in Elsam. ▪ Centralisation of procurement and centralised control with purchasers.
Communication	▪ The communication between the central purchasing department and the power plants is important to secure that the purchasing agreements are implemented locally via the purchasing group.

Table 17 Summary of findings from interview with the environmental coordinator at the central purchasing department.

8.4 Waste and Energy

Frits Unold is a regulatory coordinator and works together with 4 others in the "Waste and energy" department that is part of EKM. His main area of responsibility is research and development related to waste incineration, which emphasises compliance with regulation and collaboration with authorities. He has worked for Elsam since 1972 focusing on waste incineration since 1991.

8.4.1 Environmental understanding

Frits Unold has a strategic view on environmental issues as he works with some of the main impacts from Elsams waste incineration plants and is part of the management group in Elsam Engineering.

Frits Unold defines environment as:

"*Environment is a term that covers both external environment and occupational health and safety. The wall is filled with certificates as you can see*." (Unold, 2006)

Several times during the interview he refers to the environmental certifications as he feels that they are of great importance for the development of environmental initiatives in Elsam. He finds that environmental considerations related to waste incineration are of significant importance, and not just because of the potential impacts from the waste:

"*It is important to work with environmental issues so that the good image waste incineration has in Denmark is maintained. The image is much better than in other countries*." (Unold, 2006)

To clarify the main environmental impacts from Elsam he answers:

"*The emissions from the incineration and our waste products are the most significant impacts.(..) As the waste incineration plants are obligated to work with environmental issues in order to comply with the law, it is necessary in this business*." (Unold, 2006)

With this in mind he is asked if the environmental policy covers the significant areas.

"*I think that the environmental policy fits our environmental efforts very well, especially since we included the physical working environment. I participated in the development of the policy*." (Unold, 2006)

He afterwards described that the policy should not only cover the main environmental impacts but also the other areas of relevance for the employees in Elsam and for the organisational image.

Summary related to theoretical framework

The environmental management system, including the certificates and the environmental policy, are important *facts*. Frits Unold *reasons* that the policy is appropriate as it covers both the significant environmental impacts in Elsam, elements of relevance for the employees and the issues of relevance for the organisational image. Frits Unold *values* the environmental effort as a necessity in order to run waste incineration plants in a professional way.

8.4.2 Momentum in environmental activities related to research and development

Frits Unold has the main responsibility for the environmental management systems at the waste incineration plants:

"*Environmental management takes a lot of resources and I think that the benefits are limited, but it is my responsibility*." (Unold, 2006)

This view on the limited benefits should be seen in the light of the fact that the main impacts from their waste materials are regulated through legislation and therefore he finds it more important to influence the regulation:

"*It is very important that we participate in the development of new regulation. We want a regulation that secures that people have trust in us. We have the knowledge about the potential hazards so we should participate in developing the regulation*" (Unold, 2006)

Asked who he mainly collaborates with internally in Elsam regarding environmental issues he answers:

"*We have the AMSG group where we handle new initiatives, and it is important that we know each other personally as well, in order to collaborate and draw on each others knowledge*." (Unold, 2006)

Besides the work in the AMSG he finds that the consultants in EKM are beneficial for his work:

"*I often use people from EKM to help me with e.g. environmental approvals. It is important that we have them for assistance*." (Unold, 2006)

This is in coherence with the function that EKM wants to have as consultants for the other departments. Frits Unolds environmental knowledge related to procurement is applied both locally related to the incineration plants and strategically related to regulation.

Summary related to theoretical framework

Frits Unold mainly *communicates* on two different levels when it comes to environmental issues. He sees his primary task as collaborating with authorities in order to influence the development of new regulation. Internally he collaborates with both AMSG and EKM. It is especially important to have a central environmental department when the local employees at the waste incineration plants have limited environmental knowledge. Having the responsibility of the environmental management system for the waste incineration plants it is interesting that Frits Unold does not see the benefits of the system.

8.4.3 Green procurement

Frits Unold does not apply the questionnaire in his communication with the suppliers, as the services he purchases call for other types of demands than the questionnaire addresses. Relating to the appliance of the questionnaire at the power plants he says:

"*I am surprised how much effort the local purchasers put into green procurement. They did not get any additional resources, but find time for it anyway*." (Unold, 2006)

He thinks that other areas than green procurement are prioritized at the waste incineration plants.

"*At the waste incineration plants there are only a few employees and when they prioritise the environmental management system with goals and targets and everything; then it is difficult to find time for green procurement as well*." (Unold, 2006)

Despite the fact that Frits Unold does not apply the questionnaire when communicating with suppliers he believes that the environmental demands that he sets for the suppliers lead to changes in their environmental practices. The suppliers have to comply with the strict regulation that Elsams waste is subject to in Denmark, and they are not used to this. (Unold, 2006)

"*I primarily communicate with the suppliers that dispose our waste; primary fly ash and slag, I seldom buy products as such. (...) We do not use the questionnaire when communicating with the suppliers, but I require that they comply with the law*." (Unold, 2006)

Asked whether the communication with the suppliers have changed over time he answers:

"*It is very important that we prioritize our work and work with the environmentally significant supplier. We have become better at prioritising over time*." (Unold, 2006)

This improvement is both local and central as still more product groups are included in the purchasing agreements, and he finds this beneficial:

"*It is important that we centralise, e.g. the purchase of chemicals, but purchasing the specific products for the plants should be done locally. We have to be able to order spare parts when we need them*." (Unold, 2006)

His view on what should be centralised and localised according to green procurement are in line with the actual practices in Elsam. This makes it possible to both order the things the plants need on a daily basis and to use their collective bargaining power.

Summary related to theoretical framework

Frits Unold reasons that when *communicating* with the suppliers there can be specific situations where the questionnaire does not cover the legal demands. These situation must therefore be addressed by other means. He finds that the local purchasers do include the questionnaire in their *practices* even though they have limited resources for it. He *values* the rationalisation that has happened with the development of centrally developed purchasing agreements.

8.4.4 Summary related to theoretical framework

In table 18 a summary of the findings in the Waste and Energy department related to the theoretical framework is presented.

Theoretical concept	The Waste and Energy department
Emphasised practices	▪ Local purchasers do include the questionnaire in the practices even though they have limited resources for doing so. ▪ There are environmental demands for the suppliers, but not those included in the questionnaire.
Important artefacts	▪ The environmental management system, including the certificates. ▪ The environmental policy. ▪ Centrally developed purchasing agreements.
Reasoning	▪ The policy is appropriate as it covers both the significant environmental impacts in Elsam, elements of relevance for the employees, and the issues of relevance for the organisational image. ▪ As the local employees have limited time for purchasing it is impressive how much effort they put into green procurement.

Values	▪ The environmental effort is necessary in order to run waste incineration plants in a professional way. ▪ The organisational image is valued. ▪ Development of centrally developed purchasing agreements is effective.
Communi-cation	▪ When communicating with the suppliers there can be specific situations where the questionnaire does not meet the legal demands and has to be dealt with in another way. ▪ Collaborating with authorities in order to influence the development of new regulation. ▪ Collaboration with EKM as they work as consultants. ▪ Frequent meetings with experience exchange in AMSG.

Table 18 Summary of findings from interview with the regulatory coordinator in EKM.

8.5 Conclusion

There are some differences in the way the three departments perceive the implementation of the green procurement. The central environmental department finds that the purchasers, to some extent, counteract the implementation, whereas Waste and Energy are impressed by how much energy the local purchasers put into it. EKM finds that the other departments ought to ask for more assistance. In the central purchasing department they have a lot of experience with purchasing and do not find that they need this assistance.

The environmental questionnaires are not appropriate everywhere in the organisation but are seen as important. In some of the larger tenders product oriented demands are made and the central purchasers together with the purchasing group are responsible for this. It can be problematic if these demands for the large tenders are made without consulting EKM, who ought to have better competences in identifying the right demands to set.

Waste and energy is one of the departments where they have chosen not to follow the green procurement procedure, but each time they consider what the reasonable questions there are to ask. This is only possible because the person responsible has experience with environmental issues in this field and knows what to address.

Due to conflicting interests in the development of the green procurement procedure and the questionnaire, Elsam ended up with one questionnaire illustrating the lowest common denominator. Seen in that light, the organisation might benefit from having more than one questionnaire for different purposes. This way product purchases on a local level would not be subjected to the same limitations as large purchases that are subject to EU demands and limitation. This is actually the reason why they do not ask for products with an environmental label.

The process of developing the questionnaire was difficult and this might prohibit revision of the procedure and questionnaire, as no one wants to start the process and discussions all over again. This can constitute a problem in the further development of green procurement in Elsam.

The environmental effort is prioritized in Elsam, but even at the strategic level there are examples where a lower priority is assigned to environmental aspects than EKM finds appropriate. It is difficult for the employees in EKM to understand why the power plants resist the changes related to green procurement. On the other hand they are aware that the culture related to environmental issues differs from department to department in the organisation. EKM refers to the environmental improvement projects at the power plants as "small projects", but they are regarded as important for the power plants.

EKM focuses on how they can assist the other departments; they focus on their role as consultants. However this might prohibit them from gaining experiences and ideas from the other departments in order to create ownership and easier implementation of the tools that EKM provide for the other departments. This is further underpinned by the fact that the other departments have to pay for the assistance from EKM and therefore limits the interaction. This seems to be the case for the purchasing group.

Reflections and recommendations for future implementation strategies:

- The idea of preparing one common questionnaire does not apply for all types of procurement; several target oriented versions of the questionnaire is preferable.
- Some plants have only a few employees and they find the questionnaire difficult as purchasing is a minor part of their job. It is therefore important that they are introduced properly to the procedures and purchasing agreements in order to ease their job.
- Believing that it is possible to create one questionnaire for all interested parties and focusing on consensus affects the output of the process.
- EKM is focused on their role as consultants but it would be interesting to exploit the possibility of using local purchasers and environmental coordinators as a source for experiences and knowledge; a more bottom up approach.
- If the purpose of making a green procurement procedure is to ease the process of green procurement in Elsam, it is important to address the local purchasers in the development process. On the other hand there should be a top-down approach to secure that the procedure meets the original goals set for green procurement.
- It could be a part of the continuous improvements in the environmental management system that EKM revise the questionnaire and includes, for example, new possibilities for action plans with suppliers not meeting the demands.
- A product oriented approach should be implemented in the supplier evaluation questionnaire.
- EKM ought to assist in setting environmental demands in larger tenders in Elsam to secure that the important environmental impacts are met.

References for chapter 8

Carlsen (2007): Interview with central purchaser Erling Chr. Carlsen situated at Enstedværket, january 2007.

Christensen (2007) Interview with system coordinator Yrsa Thomsen Christensen, january 2007.

Elsam (2005a): Agreements between craftsmen and contact persons relating to work done at Elsams Power Plants.

Elsam (2005b): Terms of reference for the storage purchasing group.

Elsam (2006): Safety and Environmental handbook for EKM.

Elsam (2007a): Safety and Environmental handbook for Elsam.

Elsam (2007b): Safety- and Environmental instructions for craftsmen (eksternal) at Elsam

Iversen (2006): Interview with environmental coordinator Helle Mose Iversen. June 2006.

Raun (2004): Egon Raun: Belysning af formål og begrundelse for Elsams leverandørkommunikation (Illumination of purpose and background for Elsams supplier communication). Internal note, Elsam, 2004.

Unold (2006): Interview with regulatory coordinator Frits Unold. June 2006

9 Nordjyllandsværket

The purpose of the case analyses of Nordjyllandsværket is to analyse the lifeworlds and subcultures related to environmental effort with a focus on communication with suppliers. The main characteristics related to this subculture are identified, and it is investigated how these affect the implementation of green procurement.

The two main groups of actors related to the implementation of the supplier assessment are the environmental coordinators and the purchasers, who are analysed individually. The focus of each analysis is on the actor's perception of the organisation and the environmental effort at the power plant. After the individual analyses the findings are related to the theoretical framework and finally, the conclusions of the analyses are presented.

Nordjyllandsværket December 2006.

The empirical knowledge for the analysis is based on the following material:

- Interview with the environmental coordinator, Jørgen Jensen 13/12-2006
- Interview with the shop manager Jørn J. Bach 13/12-2006
- Interview with local purchaser Hans Hessellund 13/12-2006
- Green account from the plant (2004, 2005 and 2006)
- Brochure introducing the plant, 2006
- Purchasing procedures from the environmental management system, 2006
- Safety- and Environmental demands for craftsmen (external) at Nordjyllandsværket, 2006
- Material concerning occupational health and safety at the plant, 2006

Besides the material listed above, the analysis is inspired by general knowledge about Elsam built up through 4 years of work with the innovation consortium in CEMIP.

The quotes from the interviews are translated from Danish. The empirical data has not been updated since the merge in 2007 and the establishment of Dong Energy.

9.1 Organisational characteristics and environmental profile

Nordjyllandsværket is located in Vodskov close to Aalborg. It was established in 1967 and has an output capacity of 667 MW. Nordjyllandsværket is a combined heat and power plant and the net production in 2004 was 2,255 GWh of electricity and 3,431 TJ of heat for district heating. The plant has 120 employees but before 2001, when the power plants in Denmark merged, the number of employees was close to 250. Nordjyllandsværket has two CHP units. The plant uses coal and oil in the generation of electricity and district heat. (Elsam, 2006a)

9.1.1 Environmental management system

In 2000 Nordjyllandsværket was certified in accordance to the ISO 14001 standard. In 1992 they completed the first full scale SNOX plant in the world (An SNOX plant removes SO_2 and NO_x from flue gasses). (Mehlsen, 2007)

As mentioned in chapter 5, the Danish environmental regulation of power plants is strict, especially related to levels of emissions and the treatment of waste. As a part of their compliance with government regulations Nordjyllandsværket prepares a green account each year.

According to the green accounts from 2007 some of the environmental goals accomplished in 2006 are:

- Improved analyses of occupational health and safety risks based on mapping accidents and "close to" accidents.
- Separation of the sewage system in order to prevent substances from contaminating the entire system in case of accidents.
- Registration and investigation of 61 "close to" accidents.
- Mapping energy usage in administration building
- Mapping possibilities for reducing SO_2 and NO_x emissions.
- 50% reduction of substances containing tin in sewage water from processing. (Dong energy, 2007a)

The goals include both occupational health and safety issues and external environmental issues. The role of the environmental handbook and environmental procedures are addressed later in the chapter.

9.1.2 The structure of environmental work

Nordjyllandsværket has an environmental employee, Jørgen Jensen. His primary responsibility is managing and updating the environmental management system at the plant. He also participates in the implementation of projects, especially by preparing the written documentation, and the environmental communication with local authorities.

The environmental department has two full-time employees; the other position is "health and safety coordinator". In Elsam there is an environmental and health and safety steering group (The Danish abbreviation is AMSG) that the environmental coordinators participate in, including Jørgen Jensen. It is in this group that new initiatives in Elsam are planned.

The employees at Nordjyllandsværket work in self-governing teams and these teams are responsible for applying procedures from the environmental management system in their practices. This is also the case for green procurement in the purchasing department.

9.2 The environmental department

Jørgen Jensen is responsible for the maintenance of the certified environmental management system. In order to analyse the implementation of supplier evaluation at Nordjyllandsværket, Jørgen Jensen was interviewed. The following presentation gives an impression of how the environmental effort is handled from the environmental coordinators' point of view.

9.2.1 Environmental understanding

When Jensen (2006) got the position as environmental coordinator in 2000 he decided to get an environmental education (bachelor in Human Ecology from Aalborg University). The inputs he got through his study influence the way he works with and perceives environmental issues. (Jensen, 2006)

Jørgen Jensens has a broad understanding of both local and central initiated environmental activities. He emphasises the difference between his private understanding of the term "environment" and his professional understanding. His professional understanding mostly relates to the documentation of inputs and outputs from the plant. Asked for his definition of the term environment, he answers:

"*My understanding can be separated in two related to work and my private life. At work it is related to the documentation of our practices from the coal enters the harbour until the emissions leave the plant. My private view is that we shall ensure that there is an earth for our descendants, with the same resources that we have*." (Jensen, 2006)

The focus on documentation can probably be related to his daily working practices, as it is his responsibility to update and document the environmental management system.

Jørgen Jensen was asked which environmental projects are the most important in the organisation. In the answer he emphasises local projects to reduce the emissions of nitrogen oxides and sulphur oxides and the use of surface water instead of drinking water. More general projects in Elsam are also mentioned such as the VENZIN project (a strategic project concerning production of bio-fuels) and plans of pumping CO_2 into old oil wells. Thereby he also addresses a strategic view of the environmental effort.

Jensen stresses the differences between the environmental practices in local and central initiatives in Elsam.

"*Locally there are limited resources for product oriented initiatives related to purchase, but the considerations are present in some specific cases e.g. the energy consumption for computer monitors and environmental labels on detergents*." (Jensen, 2006)

He describes how it is easier to develop product oriented initiatives centrally as they have more time, power and environmental knowledge to do so. Is this a good approach? It makes sense that the strategic decisions are made centrally in EKM where most of the environmental competences are placed; on the other hand, this should not be a hindrance for local product oriented initiatives, for example those relating to green procurement.

The immediate response to the question of Elsams environmental values was:

"To be open, trustworthy and honest" (Jensen, 2006)

Jørgen Jensen explains how the attitudes towards environmental issues have changed since the organisation lost its status as a monopoly on the Danish electricity market:

"*Previously during the monopoly we acted more introverted. The positive attitudes towards environmental issues were probably present, but we did not enter into a dialogue unless we were forced to. Today, we are a more extroverted organisation that is more proactive in relation to these issues*." (Jensen, 2006)

He explains that if an organisation is based on market terms, it needs to consider these terms in the way they operate. As Elsam is one of the most polluting industries in Denmark, they have to work with and communicate about environmental issues. This illustrates why Elsam has chosen a more open communication strategy compared to their previous strategy where they avoided such communication.

This communicative approach could have been implemented previously at the power plants if regulation had required them to do so. As this was not the case Jørgen Jensen finds that the liberalisation leads to more openness.

Summary related to theoretical framework

The way Jørgen Jensen *reasons* about the environmental policy and his knowledge about environmental initiatives in Elsam shows that he has a profound environmental knowledge. He *values* a product oriented approach in the environmental effort but finds that there is not enough resources to handle this locally. In this is an assumption that the product oriented approach demands more resources. The environmental policy is an important *artefact* as it guides the environmental effort both locally and centrally. Jørgen Jensen *values* the environmental effort as important as he perceives Elsam to be one of the most polluting companies in Denmark. Running the power plant on market terms requires, according to Jørgen Jensen, a *communicative* approach to environmental issues. The power plants could also have chosen a more proactive and open approach to environmental communication previously.

9.2.2 Momentum in environmental activities

This section illustrates that communication both locally and with other departments is essential for the success of the environmental activities at Nordjyllandsværket. The environmental coordinator at Nordjyllandsværket mainly collaborate with the central environmental department in Elsam (EKM) regarding environmental issues:

"*We often collaborate with EKM, almost daily. We know, that the challenges we faces are often the same as the environmental challenges at the other power plants. Sometimes we form a group under AMSG to take care of specific challenges*" (Jensen, 2006)

The merge with the other power plants has influenced the environmental effort at Nordjyllandsværket resulting in the establishment of the formal network in "Environmental and Health and Safety Steering Group" (AMSG). This group has among other issues discussed and developed the procedures for green procurement in Elsam.

Jørgen Jensen explains that the values related to environmental issues at the plant are based on the policies made by the top management, and the employees are then informed of the strategic environmental projects. The values related to local environmental initiatives are almost ignored but employee participation is considered important. The argument for employee participation is the work in self-steering groups:

"*When the power plants were merged with the other power plants in Denmark in 2000 the management structure also changed, and a lot of employees were fired. They were to work in self-steering groups, which was a huge step for the employees*" (Jensen, 2006).

At the same time the environmental management system was implemented and the implementation had a high level of employee participation.

"*We used a lot of time on the implementation of the environmental management system. Therefore the daily environmental practices are working fine, and there is a limited use for follow-up action. The procedures have become a part of the daily work practices*." (Jensen, 2006)

This thorough implementation of the environmental management system has made it easier to implement new initiatives later on.

"*The focus on the social implementation is seen as less important than the technical one, as it is seen as a matter of course that the attitudes towards environmental initiatives are positive*." (Jensen, 2006)

The thorough implementation is also visible when talking to other employees at the plant as their knowledge and understanding of environmental issues is relatively broad.

It is important for Jørgen Jensen to ensure that the employees find the environmental projects relevant.

"*There is no reason for making an environmental assessment of the local bicycle shop where we buy 20 bicycles every 5 years. If we are working with environmental issues that work against common sense, the employees lose their commitment*" (Jensen, 2006)

This shows that he finds it important to prioritise the important environmental initiatives in order to keep the employees committed and maintain their positive attitudes towards environmental issues. Employee participation is an important initiative at the plant; therefore the environmental coordinator has previously put a lot of effort into this when implementing environmental management. The employees can influence the development of the environmental goals at the power plant, as initiatives from the employees are prioritised in the environmental management system. The employees are represented in an environmental committee where the department managers also participate. The environmental employee, Jørgen Jensen, finds that there is a positive attitude towards the environmental effort at the plant and the related routines are embedded in the behaviour (Jensen, 2006).

The fact that the employees work in self-steering groups also underlines the importance of the socio-cultural approach, where some of the responsibility for the environmental effort is distributed to the employees.

The environmental employee mentions a number of artefacts as an important means to visualise the local environmental effort.

"*The signs with symbols are positive as they call for a change in attitude that is not the case with movement sensors that could be an alternative solution to the same problem*." (Jensen, 2006)

Environment is high on the agenda at the staff meetings 6-8 times a year, as a means to keep the environmental issues on the agenda in regard to purchasing. Jørgen Jensen finds that the use of and experience with the procedures is important for the environmental effort of the purchasers. Jørgen Jensen finds that there is a common acceptance of the importance of following the procedures in the environmental handbook. (Jensen, 2006)

Summary related to theoretical framework

Communication, both with the central environmental department and with the AMSG group, is important for gaining experiences from others and to motivate the environmental practices at the plant. At the plant the *communication* between the environmental department and the employees is formalised through staff meetings, but it can also occur ad hoc. Jørgen Jensen finds that the *practices* gained by following the procedures in the environmental handbook are important for the environmental effort and the employees' attitudes towards it. He *reasons* that visibility of the environmental effort is important; therefore *artefacts* as signs asking people to turn off the light are a more appropriate solution than e.g. movement sensors. Jørgen Jensen stresses the importance of the environmental policy as a *value* creator. He *reasons* that the practices at the plant, and also those central in Elsam, are in line with the environmental policy and therefore it is appropriate.

9.2.3 Green procurement

There has not been made any local changes in the questionnaire for the suppliers of the plant, it is similar to the one developed in Elsam Kraft. There have none the less made some local changes in the green procurement procedure, as the plant has chosen only to make environmental assessments of suppliers who have a significant impact on the plants environmental performance.

"*We made the changes in order to prevent that the employees find the environmental assessment to be without purpose*." (Jensen, 2006)

This approach fits the purchasing practices at the plant:

"*When purchasing services it is the responsibility of the single employee to assess whether an environmental assessment is necessary. This goes hand in hand with the fact that the employees works in self-steering groups. If they are in doubt they can always ask me*." (Jensen, 2006)

The questionnaire for supplier assessment has been introduced in staff meetings in the different departments, with a separate introduction for the purchasers. The schemes were received positively by the employees. (Jensen, 2006)

At the plant the environmental coordinator works with projects that are visible to the employees; one example is reduction in the number of chemicals and detergents (see section 9.3.2).

Summary related to theoretical framework

An important *practice* related to supplier communication is introduction of evaluation schemes at staff meetings in the different departments and a separate introduction for the purchasers. The environmental employee *reasons* that the changes in the assessment procedures are important to secure that the employees find the supplier assessment relevant.

9.2.4 Findings related to theoretical framework

In table 19 the findings related to the environmental coordinator are presented.

Theoretical concept	Environmental department at Nordjyllandsværket
Emphasised practices	▪ The questionnaire to suppliers is an important artefact in the procurement practices. ▪ Following the procedures in the environmental handbook is an important practice. ▪ Self steering groups develop environmental initiatives. ▪ Participation in knowledge network (AMSG).
Important artefacts	▪ Jørgen Jensen has profound environmental knowledge and it has a positive influence on the environmental effort at the plant. ▪ The questionnaire related to supplier evaluation is applied without local changes. ▪ The environmental policy. ▪ Focus on using artefacts to govern behaviour, e.g. written procedures in the handbook and the environmental policy.

Reasoning	▪ The environmental issues are addressed by the management and thereby accepted by the employees. ▪ Environmental issues are a matter of monitoring and reporting measurements and controlling emissions. ▪ There are local changes made in the green procurement procedures in order to secure that the procedures are not found insignificant by the employees. ▪ A product oriented approach to environmental initiatives are preferable but difficult to handle locally especially for the purchasers as they have limited environmental knowledge. ▪ Elsam is one of the most polluting companies in Elsam therefore it is important for the organisation to be open and communicate about environmental issues to maintain a good image. ▪ Visibility of the environmental effort is important to maintain momentum.
Values	▪ Real environmental improvements. ▪ Employee participation. ▪ Following the policies made by the management is important to implement the common procedures prepared in collaboration with EKM.
Communication	▪ At 6-8 staff meetings a year environmental issues are on the agenda as a means to stress environmental issues. ▪ The collaboration in AMSG works towards a common view upon environmental issues, and ensures that the work is in line with the policies. ▪ The surroundings, both private and professional relations, affect the view on environmental issues. ▪ The communication between Jørgen Jensen and the employees is important in order to secure momentum in the environmental efforts.

Table 19 Summary of findings from interview with the environmental coordinator at Nordjyllandsværket.

9.3 The purchasing department

The primary focus in this analysis is the implementation of the environmental assessments of suppliers but the general implementation of environmental management is also touched upon. The following section gives an impression of how the environmental effort has been handled from the purchaser's point of view. The analysis is based on interviews with one of the two purchasers from Nordjyllandsværket and their manager. They have both been working at Nordjyllandsværket for about 20 years.

The two purchasers work with the same tasks and continuously split the assignments between them. Most of the supplies are ordered via fax. Price, quality and consistency of supply are the main criteria for selecting suppliers. (Hessellund, 2006)

9.3.1 Environmental understanding

Both the purchaser and manager define the term "environment" as something that encompasses external environment and working environment. This is in line with the integration of the environmental management system and health and safety management at the plant. The purchasers emphasises that the focus on environmental issues have changed during the past years.

"*Environment is something we gradually have learned to put in focus. When I started working here we did not consider environmental issues. Today we have made an environmental evaluation of most of our suppliers and we consider which chemicals and materials we use*." (Bach, 2006)

The manager has worked at Elsam for more than 20 years and environmental issues were not on the agenda when he started at Elsam. The manager explains what environment is, with a focus on external environment:

"*It is to behave in a way, so that the organisation is aware of the nature, we are placed in the middle of. We are a part of the frame. The nature is the looser or the winner according to how we behave. The word we use for this is environment*." (Hessellund, 2006)

When asked what are the most significant environmental projects Elsam has been working with, the answers is:

"*It is to get an environmental certification; it is a tiger jump to make that decision and to include working environment*." (Bach, 2006)

"*It is both related to internal and external environmental issues, but also the working environment. Related to the external environment there are two issues; reducing emissions and choosing the proper suppliers*." (Hessellund, 2006)

Their understanding of Elsam and the environmental differs. The manager focuses on the strategic level and the decision to implement an environmental management system. The purchaser naturally relates to the practices and how the supplier evaluation fits into the environmental effort. Both of them relates to the environmental effort at the plant, not to Elsam as such. They focus, not surprisingly, on the actual practices and their consequences.

Even though both respondents focus on the environmental management system as the important backbone for the environmental effort, they also describe the importance for the organisational image.

"*Elsam would like to have a positive environmental image. There are negative relations towards the use of coal as fuel. Therefore, Elsam tries to maintain a positive image in other areas. We cannot allow leakage of oil to Limfjorden (a local waterway) or employees that have accidents."* (Bach, 2006)

It is the official values the purchasers mention as important:

"*Our values are something others have made. It is a big organisation, where the things have been thought through, and it is these values that we are driven by*."(Hessellund, 2006)

This is further emphasised as they describe how the environmental policies are corresponding with the actual environmental practices performed in Elsam.

"*I think that the environmental policy corresponds with our daily environmental effort. It is essential to reduce our environmental impacts*." (Bach, 2006)

The purchasers find the environmental effort important for Elsam; this is illustrated in the following quotes.

"*Previously we strongly opposed windmills because they interfered with our production, but now we are part of the wind energy production. Maybe that is what initiated the change in attitude towards environmental issues*." (Hessellund, 2006)

"*We are building an image that we take care of the nature. I do not think that it matters in relation to the end user; he is not the one we sell our electricity to. It is important for the organisation, and we have changed a lot during the past 20 years*." (Hessellund, 2006)

The first of the two quotes also addresses the fact that in Elsam there has historically been an opposition towards environmental issues, as they were related to technologies, especially windmills, which interfered with the production at the power plants. The problems still exists today but it has become an integrated part of development of the grid. The greener image is not related to the end user (Elsam does not distribute the electricity) but the general public as such, as well as other actors such as investors and distributors. (See also section 7.1)

Summary related to theoretical framework

Historically the environment has not been an important *fact* at the plant but this has changed over time and now both internal and external environments are included in the employees' understanding. The organisational policies and the procedures in the environmental management system are governing the environmental *values*.

An important fact is that the purchasers find it important that the environmental initiatives lead to actual results. The manager *reasons* that Elsam was previously opposed to environmental initiatives but this has changed and it is now a part of the organisational image.

9.3.2 Momentum in environmental sound purchasing

A part of the environmental management system relates to supplier evaluations, and is based on a distinction between eight categories of suppliers. These are listed below and the action related to the green procurement is described.

Type of supply	Collective purchasing agreement	Local environmental evaluation	No significant environmental impact	Responsible for environmental issues
Product	X			Central purchaser
		X		Local Purchaser
			X	
Service	X			Central Purchaser
		X		Local Purchaser
			X	
Chemicals	X			Local health and safety group
		X		

Table 20 Categories of suppliers for Nordjyllandsværket.

When the purchaser is considering working with a new supplier, there are several different ways to handle the environmental assessment. The first thing to consider is whether a purchasing agreement should be made between the supplier and Elsam. In that case, environmental issues have already been considered and the purchaser can work with the supplier without further evaluations.

If there is no collective purchasing agreement the purchaser must consider whether the product or the service from the supplier has a significant impact on the environmental performance of Nordjyllandsværket, and whether the supplier will be used continuously. If that is not the case no environmental evaluation should be made.

"*If there is a risk that the supplier will affect the environmental performance of the plant, or if the supplier is used often, an environmental assessment has to be made*." (Hesselund, 2006)

Finally, suppliers of chemicals are a special category.

"*When considering using a new chemical the health and safety group makes an assessment of the chemical, before allowing the purchase*." (Hessellund, 2006)

The procedures and policies are important facts for the purchasers, as described previously, but other issues are important as well. When asked where new environmental initiatives related to purchasing are initiated the answer is:

"We use the purchaser group to start up new environmental initiatives." (Hessellund, 2006)

Asked for the argument for integrating environmental issues in purchase, the manager answers:

"*The environmental assessment needs to be there. It is unfair competition between the suppliers if some of them e.g. do not have work insurance. You get a more fair competition*." (Bach, 2006)

As the manager finds that the environmental supplier assessment is a premise for "fair competition" there is a positive attitude towards it.

Besides, he also stress that the work should have an output and lead to environmental improvements:

"*We should take care that we only work with the important aspects; it is easy to end up working with unimportant issues in the environmental effort*." (Bach, 2006)

This is much in line with the perspectives presented by the environmental coordinator as they both find that prioritisation in the environmental effort is important.

Summary related to theoretical framework

The categorisation of product and services and the responsibility for conducting environmental supplier assessments is an important *fact,* which the purchaser and manager refer to several times. Environmental considerations are *valued* as a natural part of purchase but the manager *reasons* that it is important to prioritise in the environmental effort. This is potentially dangerous as it might lead to a circle where less and less environmental issues are addressed and thereby less important aspects are identified, and no one identifies the potential problems. This can be the case for both the supplier assessment and the environmental effort as such. On the other hand it does make sense to focus the environmental effort on environmentally significant areas.

9.3.3 Green procurement

As the manager mentioned that it is important to prioritise the environmental effort the purchaser was asked whether the assessments lead to actual changes:

"*I do not know if the communication leads to any changes in the practices of the suppliers and I do not remember any exclusion of suppliers*." (Hessellund, 2006)

"*Most of the main suppliers of products are included in the purchasing-agreements made centrally. Therefore, we seldom have to make environmental assessment of product suppliers*." (Hessellund, 2006)

The environmental coordinator finds that if the supplier evaluation does not lead to actual environmental improvements it can be hard to understand the reason for spending time on these evaluations. However this does not seem to be the case. On the other hand, if less and less suppliers are assessed, is it then strange that the purchasers do not identify anyone that does not meet their demands?

What motivates the purchasers then? The respondents agree that the environmental management systems are important. Previously it was mentioned that the purchasers participate in projects in Elsam, such as reducing the number of detergents used, and environmental supplier assessments are a part of that procedure. This means that their environmental effort in the purchasing group actually leads to environmental improvements, but not due to the local assessments of suppliers.

The other purchaser thinks of the issue differently:

"*We have 18 primary suppliers, there is no doubt that we influence their attitudes and that they learn something from our collaboration. But we are not unique; all larger companies do the same*." (Bach, 2006)

Thereby he thinks that their collaboration with the suppliers leads to indirect changes. The present status for the use of the centrally developed purchasing agreements is described by Hessellund:

"*80 % of the products we buy come from 20% of our suppliers. We do not use all the purchasing agreements but we are reasonably loyal towards them. We both include steal and electrical products and that is some of the big suppliers*." (Hessellund, 2006)

There is an acceptance of the fact that the purchasers are to use the purchasing agreements, on the other hand they sometimes find it beneficial not to do so and use a local supplier instead.

During the interviews it was discussed whether the present assessment procedure is an appropriate way to obtain the goals in the environmental policy. The manager was aware that they primarily focus on policies and legislation when assessing the suppliers, and do not evaluate the products as such.

"*The employees do not have the competence to evaluate the single products, and we do not ask the suppliers if their sub suppliers use child labour. Such assessments should the central environmental department take care of*." (Bach, 2006)

Even though he finds that the purchasers do not have the competences to make environmental assessments of the products, he is not dismissive to the idea.

"*I have previously spoken to the environmental department in Wattenfall, they only evaluate the product, not the supplier. That is another way of doing it. We might be able to learn something from them*." (Bach, 2006)

The manager considers these issues, and knows that they might benefit from a product oriented approach with product assessments instead of supplier assessments. The interaction with Wattenfall and their way of handling the environmental assessments of products shows that the manager is open-minded for new ideas.

Summary related to theoretical framework

The respondent's *value* the motives for conducting supplier assessments but find that it should focus on the areas with potentially significant improvements. The environmental management system is mentioned as an important *fact* and participating in projects is important for the respondents' motivation and knowledge as well. The manager *reasons* that other approaches to green procurement, focusing on product evaluations, could be beneficial as well.

9.3.4 Findings related to theoretical framework

In table 21 the findings related to the subculture of the purchasing department is related to the theoretical framework.

Theoretical concept	The purchasing department at Nordjyllandsværket
Emphasised practices	▪ The work in the purchasing group is important as they determining new environmental issues to be addressed. ▪ The categorisation and specification of responsibilities for environmental assessments of product and service groups.
Important artefacts	▪ The primary artefacts related to the environmental effort are the procedures and policies. ▪ The goals in the EMS are important for the purchasers.

Reasoning	▪ Demands for suppliers are important as other companies do the same. It is a part of normal purchasing practice and fair competition. ▪ Image is one of the main reasons for addressing environmental issues. ▪ Environmental initiatives are to be relevant in order to secure the motivation of the employees. ▪ Previously Elsam opposed to environmental initiatives but this has changed due to the changed policies of the management in Elsam.
Values	▪ Environmental policy. ▪ Environmental management system (value creator). ▪ The interaction with the environmental employee creates positive values. ▪ Environmental considerations are a natural part of purchase.
Communication	▪ The interaction with the purchasing group shows that the other purchasers are applying green procurement practices as well, and shows the possibilities in the environmental effort. ▪ Frequent dialogue with environmental coordinator. ▪ Participates in purchasing group.

Table 21 Summary of findings from interview with the purchasers at Nordjyllandsværket.

9.4 Conclusion

The environmental employee presents the values related to environmental issues as open, trustworthy and honest. He emphasises that they are interacting with primarily local authorities and visitors from schools, universities and local associations. The primary network for the environmental employee is internal in Elsam, namely the AMSG group meetings where experiences are shared between the power plants. It is not considered a directly external network as it is based on members from the same organisation, but still they are situated at different plants. Since the merge with the other power plants in 2000 and the implementation of new policies, Elsam has chosen a more open approach to their environmental effort. Previously they were resistant to communicate about environmental issues.

The environmental management system is prioritised by the management and is seen as important to create values and govern the environmental practices at the power plant. The environmental employee focuses on documentation related to his daily working practices, as he is working with practical elements of the environmental effort; updating the environmental management system and preparing the documentation. The environmental management system mainly focuses on an in-situ approach and not a product oriented view and this is reflected in the environmental employee's way of assessing environmental practices.

The strategic and product oriented decisions are made centrally in EKM where most of the environmental competences are placed; on the other hand, this should not be a hindrance for working product oriented locally e.g. relating to green procurement.

The policies are important value-creators at Nordjyllandsværket and the policies and procedures determine the practices of the environmental employee. It could be discussed if the environmental supplier assessment procedure complies with the environmental policy as the policy is product oriented while the procedure focuses on an in-situ approach, with focus on different management systems. The purchasers seem to be aware of this, but do not change it. They are actually not responsible for the gap between policies and procedures as the procedure is developed centrally. The purchasers' main task is to follow the procedures.

The basis for values for the environmental assessment procedure are interesting; as the purchasers know that other companies set the same kind of demands, they find it part of normal "purchasing practice". It is a part of the supplier assessment as well as quality, price and other issues.

The environmental employee and the purchasers all use the same stories in order to explain environmental matters. One example is their explanation of the type of suppliers which do not have significant environmental impacts, where all three interviewed persons mentioned the local bicycle shop (and several other similar examples). This is interesting as it indicates that they share a perception of what is important. The stories seem to originate from the environmental employee and are then adopted by the purchasers. This shows that the social logic is important as well. The social logic is used in order to make sense of the procurement policy and simplify it.

The environmental employee is the backbone for the thorough implementation of the environmental management at the plant. Both purchasers mention him as the one they turn to when in doubt of environmental issues but also as the one implementing new environmental initiatives. The acceptance of environmental issues and the environmental management system shows that the environmental effort is already implemented in the organisation, and seen as a matter of course.

Reflections and recommendations for future implementation strategies:

- Profound environmental knowledge in the environmental department eases the implementation of new initiatives.
- Employee participation creates understanding for the environmental effort and helps to maintain positive values.
- The environmental effort is focused on the areas where there is the largest potential for environmental improvements, as it is motivating for the employees that their environmental practices lead to actual results.
- Focusing on employee commitment is important when working in self-steering groups but including employee representatives and not just department managers in environmental decision making could lead to a higher level of participation.
- Illustrative signs and stories help the employees to understand the purpose of the environmental initiatives.
- The gap between the environmental policy and the green procurement practices ought to be considered in a revision of the questionnaire.
- If less and less suppliers are assessed the purchasers will probably identify fewer suppliers that do not meet their demands and the communication does not have any real effect. A solution to this is either to continuously heighten the demands for the suppliers or focus on some of the suppliers that were not assessed in the first round.
- At Nordjyllandsværket they have chosen to separate the responsibility of external environment and occupational health and safety and this secures that focus is maintained on both issues.

References for chapter 9

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Elsam (2006b): List of approved and deselected suppliers for Nordjyllandsværket.

Elsam (2006c): Material concerning occupational health and safety at the plant.

Elsam (2006d): Safety and Environmental handbook for Nordjyllandsværket.

Elsam (2006e): Safety- and Environmental demands for craftsmen (external) at Nordjyllandsværket.

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10 Skærbækværket

The purpose of this chapter is to analyse the subcultures related to environmental effort at Skærbækværket with a focus on green procurement. Characteristics related to the subculture are identified, and it is investigated how these affect the implementation of green procurement.

The empirical knowledge for the analysis is based on the following material:

- Interview with the environmental coordinator, Erik Kristensen 6/10-2006
- Interviews with local purchaser John Rasmussen 7/10-2006
- Green account from the plant (2004, 2005 and 2006)
- Brochure introducing the plant, 2006
- Purchasing procedures from the environmental management system, 2006
- Safety- and Environmental demands for craftsmen (external) at Skærbækværket, 2006
- List of approved and deselected suppliers for Skærbækværket, 2006
- Material concerning occupational health and safety at the plant, 2006

Besides the material listed above the analysis is inspired by general knowledge about Elsam built up through 4 years of work with the innovation consortium in CEMIP and several stays at Skærbækværket.

The quotes from the interviews are translated from Danish. The empirical data has not been updated since the merge in 2007 and the establishment of Dong Energy.

10.1 Organisational characteristics and environmental profile

Skærbækværket is a combined heat and power plan (CHP) that has around 50 employees and has existed since 1952. Skærbækværket is situated in southeastern Jutland. The power plant has an effect of 392 MW. Today the power plant mainly uses gas as fuel, and the gas turbines were taken into operation in 1997. The power plant also uses some oil. In 2006 the consumption of natural gas was 391 million m^3 and the oil consumption was around 9 million litres. (Dong Energy, 2007b)

Skærbækværket (Dong Energy, 2007b)

In 2006 the plant produced 1.9 million MWh of power and 3636 TJ of heat. (Dong Energy, 2007B) How much the plant produces each year, is related to the liberalized electricity market, and is therefore also related to the supply of electricity from other sources. The oil consumption in 2006 was higher than the previous years as, at times, there were problems with the supply of natural gas. (Dong Energy, 2007b)

10.1.1 Environmental management system

Skærbækværket is certified according to ISO 14001, OHSAS 18001 and ISO 9001. In the green account the environmental policy for Elsam is presented (See section 6.3). The environmental management system and occupational health and safety management are integrated at the plant. Each year Skærbækværket sets local environmental targets and develops action plans. In order to illustrate the kind of environmental improvements reached at Skærbækværket the main improvements accomplished in 2006 are presented below (Dong Energy, 2007b).

The main environmental improvements accomplished at Skærbækværket, 2006:

- Recertification according to ISO 14001
- Reduction of noise from block 3 (Turbines)
- Reduction of internal electricity demand for lighting (at toilets, safety room, parking areas and chemical storage room)
- Reduction of the NOx emissions by 10% through optimization of the operation of the plant.

In the green accounts it is specified that the plant focuses on employee participation in their environmental effort. This is necessary in order to make sure that the employees know how to take action, both related to the daily operation of the production units and in case of accidents. The environmental focus areas at the plant are emission limit values and specific environmental improvement projects. (Dong Energy, 2007b)

In the green account from 2004 the demands for suppliers are described, and it is explained how a number of centralised purchasing agreements have been made in Elsam. It is specified that Skærbækværket uses suppliers that are included in the purchasing agreements when possible. When local suppliers are used they are environmentally approved first. At Skærbækværket there is focus on both external environment and the accident frequencies in the assessment of local suppliers. (Dong Energy, 2007c)

10.1.2 The structure of the environmental work

Skærbækværket has a full time safety and environmental coordinator. At the plant, a well-functioning group of employees are hand-picked to manage the daily environmental effort. This can include securing that the suppliers of service are environmentally approved, and securing that the plant complies with the demands in the environmental approval. (Kristensen, 2006)

The Environmental coordinator is part of the AMSG group and he is responsible for running the environmental management system at the plant.

Skærbækværket has an intranet with relevant communication and documentation for the work with occupational health and safety and external environment. Some of the employees do not use the intranet and therefore the material is also available in hard copy. (Kristensen, 2006)

Two local adjustments for the procedure for green procurement are made. A question related to compliance with legislation is removed (They found it to be unnecessary to ask for) and a question related to environmentally labelled products is added. (Kristensen, 2006)

The purchaser has the main responsibility for the green procurement but collaborates with the environmental coordinator when in doubt. A tradition for letting the environmental coordinator talk to the service suppliers secures that they comply with the demands. (Kristensen, 2006)

10.2 The environmental department

Erik Kristensen has been safety and environmental coordinator at Skærbækværket since 2000. Previously he worked as an engineer at the plant (1969-1989) and as a production manager (1989 -2000). (Kristensen, 2006)

Erik Kristensen is in a position between the management and the employees, and he has chosen a number of the employees as contact persons regarding environmental and health and safety issues. There are plans to digitalise all information concerning the environmental effort including handbooks and reports but not all employees are willing to do so yet. (Kristensen, 2006)

10.2.1 Environmental understanding

At Skærbækværket the responsibility of assessment of product suppliers and service suppliers is separated, thereby the main responsibility for occupational health and safety is placed with the environmental coordinator whereas the purchaser is responsibility for conducting the assessment of product suppliers and focuses on external environmental issues. Likewise the perception of occupational health and safety is separated from the external environment and this gives more focus on both issues than was the case at the other plants. This is illustrated in the following.

Erik Kristensen separates the concept of external environment from occupational health and safety; therefore he focuses on external environment when asked for a definition of environment:

"*It is a broad concept. It includes everything from waste separation, emissions from the chimneys, exhaust from cars and purchase of dangerous products that we have to get rid of again*." (Kristensen, 2006)

Erik Kristensen finds that the most important environmental impacts from the plant are the emissions from the chimneys, but it is also the one that is hardest to change locally. Water consumption is the second most important. The plant has saved 150.000 DKK a year on internal water and heat consumptions due to environmental management.

Asked what he thinks of the environmental policy in Elsam he answers:

"*It suits the work we do at Skærbækværket; it is consistent with our behaviour*." (Kristensen, 2006)

In the interview it is made clear that not only does he know the policy but he actually finds it to be an important vision for prioritising the environmental effort at Skærbækværket. This coherency might be developed through frequent interaction with the central environmental department. In the interview it is discussed whether the attitude towards the environmental effort are the same at the power plants and in Elsam Engineering (and thereby in the central environmental department.)

"*We have the same opinions of what is important to focus on, but we do not agree on how to implement it when it comes to handling it in the IT system*." (Kristensen, 2006)

This is related to the resistance among the employees to work with IT. The coordinator finds that coherence exists between the practices in the environmental effort at the plant and in the central environmental department in Elsam. This might relate to the fact that they are actually situated in the same building and have frequent interactions.

Summary related to theoretical framework

The environmental *values* of the coordinator are in line with the centrally developed *values* in the policies which might be due to the frequent *communication* with the central environmental department. Besides this his definition of the concept of environment is in line with the policies and visions in Elsam. He emphasises that the *practices* follow the visions and he thinks that there is coherence.

10.2.2 Momentum in environmental activities

In the analyses below it is shown how employee participation and frequent interaction with EKM are the two main cornerstones in the momentum of the environmental effort at Skærbækværket.

During a stay at Skærbækværket in 2006 it became obvious that the interaction between the environmental coordinator and EKM is both frequent and rewarding. It often happens that they eat lunch together as they use the same canteen. Asked whether it is important for the communication that Erik Kristensen knows the employees in the central department he answers:

"*I mostly communicate with the people that have a history in the organisation. It is a problem that we have to pay for their service; otherwise we would use them more frequently*." (Kristensen 2006)

The coordinator contacts EKM several times a month to get help in environmental issues. It is mostly one specific employee he communicates with. The economic considerations are related to the fact that the central environmental department employees work as consultants for the plants and the plants pay for using the consultants. At Skærbækværket new initiatives are closely coupled to the environmental management system.

"*Environmental initiatives are initiated by either goals in the environmental management system or new legislation*." (Kristensen, 2006)

The coordinator finds that the environmental management system is a strong tool for securing continuous improvements of the environmental performance of the plant. EKM approves the environmental goals each year, thereby securing that the practices at the plant are in compliance with the formal policies in Elsam. This communication with the central department helps to exchange experience between the plants so that accidents at one power plant are avoided in other power plants.

Employee participation is prioritised at the plant, and it has also been a focus area in the green accounts for several years (Dong Energy, 2006b and Dong Energy, 2007c). The coordinator explains that they use daily routines as a way to keep focus on the environmental effort.

"*On a daily basis we all have to separate our waste and turn of the light when we leave, that helps us keep focus*." (Kristensen, 2006)

The environmental management certification is of importance for the plant and the momentum in the environmental routines:

"*Working with environmental management helps the employees to think about the environmental impact no matter what they do*." (Kristensen, 2006)

The focus on employee participation differs significantly from some of the other plants, and it seems that the environmental coordinator has the credit for this practice. In the process of including the employees in the development of goals and action plans for the environmental effort the coordinator finds it easy to keep focus in the initiatives. The environmental policies in Elsam secure this, together with the interaction with the central environmental department.

"*I think that we cover the important environmental issues in our environmental effort, including the demands for suppliers. We work with continuous improvements and that works for us*." (Kristensen, 2006)

The work with continuous improvements both secures a momentum in the environmental effort and makes it possible to address new environmental impacts. Employee participation is important in the local acceptance of the demands from Elsam as new initiatives are always discussed in the environmental group at the plant.

Summary related to theoretical framework

Employee participation is an important *value* for the environmental effort at the plant, and the environmental *practices* are related to both environmental projects and daily routines. The environmental coordinator *reasons* that if the employees have environmental *practices* on a daily basis it helps to keep focus on the environmental effort. An important *artefact* is the environmental goals in the management system, and the frequent *communication* with the central department ensures that these are in line with the centrally developed goals in Elsam. The *communication* in the environmental group at the plant secures a local acceptance of environmental initiatives.

10.2.3 Green procurement

The analyses below show that the assessments of suppliers are not perceived to lead to any real environmental improvements but are none the less found to be of importance as it follows the environmental image of the plant.

The coordinator is not involved in the assessment of product suppliers but has the main responsibility for the approval of service suppliers. Discussing the green procurement related to buying products for the plant, the coordinator finds that it is an important tool for securing that the suppliers consider their environmental impacts.

"*It is important that the suppliers consider their environmental impact, and therefore the questionnaire is important*." (Kristensen, 2006)

He does not believe that sending the questionnaires to the suppliers actually makes then change their practices.

"*The environmental approval of product suppliers mostly leads to paperwork. It does not make the suppliers change anything. On the other hand most of the suppliers have their environmental impacts under control."* (Kristensen, 2006)

When the supplier assessment procedure was implemented at the plant, the local environmental group decided to make some local adjustments, as they found it important to set demands for the suppliers to use eco-labelled products.

"*We made some changes in the questionnaire as we feel that asking whether they comply with legislation is irrelevant. We added a question about eco-labelling*." (Kristensen, 2006)

The coordinator explains that employee participation is important when implementing new initiatives as it secures an acceptance of them. The coordinator introduced the green procurement procedures for the purchasers at the plant.

"*I made the adjustments together with the local environmental organisation, so that we all agree on them*." (Kristensen, 2006)

The question added regarding eco-labelled products introduces a product oriented approach in the questionnaire. This perspective is also included in other ways.

"*We have a product oriented question in the questionnaire regarding eco-labelling but besides that we do not consider these issues. We do not talk to the sub suppliers and such*". (Kristensen, 2006)

The practice for assessing product suppliers and service suppliers differs. The product suppliers are assessed through the questionnaire and the service suppliers are taken in for a face to face discussion in order to secure that they meet the demands for occupational health and safety. The face to face discussions are supplemented with a written declaration:

"*Our local suppliers are evaluated through the questionnaire. The employees tend to bring the contractors here. The suppliers of services that we use frequently e.g. the cleaning company, we talk to them once a year*." (Kristensen, 2006)

At Skærbækværket there are restrictions on what chemicals can be used, but these demands do not include the suppliers of services that work at the plant:

"*We have no demands for the products the contractors use here, as long as they bring their waste with them when they leave*." (Kristensen, 2006)

Asked whether the assessment of service suppliers ever leads to rejections, the coordinator answered that it never has. On the other hand there are suppliers that they do not ask to fill out the questionnaire in the first place because they do not want to use the supplier:

"*There is a contractor that we simply do not use. If contractors have too high an accident frequency, we will not use them*." (Kristensen, 2006)

After accepting the service suppliers the suppliers have to fill out a schedule that secures compliance with local demands at the plant.

"*The contractors fill out a schedule before they work here; so that we make sure that they comply with our demands and not violate any limit values for example noise level*." (Kristensen, 2006)

The process of approving foreign service suppliers is more problematic than with local service suppliers as they have to make sure that the supplier complies with Danish legislation and often the suppliers do not even know the legislation. They also find it harder to make the foreign suppliers follow the procedures for approvals when working at the plant:

"*Sometimes foreign entrepreneurs are hired and start working before they are approved, that is a problem, as it is difficult to identify whether they comply with the demands we have*." (Kristensen, 2006)

Erik Kristensen would like some kind of solution to the problem of foreign entrepreneurs who do not comply with, or are ignorant of, Danish legislation, as they sign the questionnaires specifying that they do comply anyhow.

Summary related to theoretical framework

Employee participation is an important *practice* in the local implementation of green procurement as the *communication* with employees secures the acceptances of new initiatives. The coordinator *reasons* that since there is a clear division of the responsibility of environmental assessments of suppliers the *practices* are easily implemented. The assessments of product suppliers are not perceived to lead to any real changes in the *practice* of the suppliers but are still found to be of importance as it shows the environmental *values* of the plant. The *communication* with the service suppliers is based on a face to face conversation as they find this as the best way to secure compliance with demands.

10.2.4 Findings related to theoretical framework

In table 22 the findings related to the environmental coordinator are presented.

Theoretical concept	Environmental department at Skærbækværket
Emphasised practices	▪ Environmental practices are incorporated in the daily work. ▪ There are frequent environmental improvement projects. ▪ The local coordinator has a face to face conversation with service suppliers.
Important artefacts	▪ The environmental management system (especially environmental goals) is a strong tool for guiding behaviour. ▪ Questionnaires for product suppliers applied with local adjustments. ▪ Hard copies of environmental instructions are necessary as some employees resist working with IT.
Reasoning	▪ If the employees have environmental practices on a daily basis, then it helps them to keep focus on environmental initiatives. ▪ The questionnaire does not make the suppliers change their practices but it is important as it shows Elsams' values. ▪ If the employees are included in the implementation of new initiatives it is easier to change their practice if they feel ownership for new initiatives. ▪ As the plant has to pay for getting help from EKM, they use them less.
Values	▪ Employee participation and consensus about environmental initiatives. ▪ The coordinator values a product oriented approach to the environmental effort. ▪ The environmental policy is consistent with the environmental values at the plant and guides their work and inspires the local environmental goals.
Communi-cation	▪ Frequent formal and informal communication with the central environmental department is of importance for the practices at the plant. ▪ It is especially persons that have a tradition for collaboration with the plant that the coordinator contacts. ▪ Communication in the environmental group secures that the employees feel ownership for new initiatives. ▪ The environmental assessment of product suppliers is implemented in collaboration between the purchasers and the environmental coordinator.

Table 22 Summary of findings from interview with the environmental coordinator at Skærbækværket.

10.3 The purchasing department

In the purchasing department there is one full time purchaser who purchases whatever is needed for the stores and is also partly responsible for the storage. The purchaser has been in Elsam for more than 25 years, the first 12 years he was for the storage and the last 13 years he has mostly worked with purchasing.

The purchaser's main task is to buy spare parts and storage items, in order to secure that the plant runs smoothly, and to buy the products used at the plant. They have 35,000 different items at the storage. He explains that many of the product suppliers are included in the centrally made purchasing agreements and he uses these to a wide extend. Some of the purchases can be made electronically and around half of the purchases are handled over the phone or by fax. (Rasmussen, 2006)

10.3.1 Environmental understanding

In the following analyses it is shown that John Rasmussen has a comprehensive understanding of the dynamics of the environmental effort in Elsam and a broad understanding of environmental issues and values in the organisation:

"*I think that environment is a broad concept that covers many things, e.g. occupational health and safety and external environment. (..) It is important that Elsam has an environmentally certificate according to ISO, it signals that it is a healthy organisation that takes care of the environment*". (Rasmussen, 2006)

In a discussion of whether environmental certifications are more important for some types of companies than others the purchaser says:

"*Elsam has decided that it is something we want and it might be related to the fact that we produce energy. Previously Elsam was often in the press with bad publicity, we never see that anymore. I think that companies that do not have an environmental certification has a disadvantage e.g. when they want to sell products to us*." (Rasmussen, 2006)

His prioritisation is different if it is from an environmental point of view:

"*The most important environmental initiative in Elsam is the cleaning of smoke and gasses from the production of electricity."* (Rasmussen, 2006)

This shows that John Rasmussen differentiates between what is important from an environmental perspective (cleaning the smoke) and what is most important from a communication perspective in the product chain (environmental management). Asked whether the Environmental policy in Elsam complies with the actual practices at the plant the purchaser answers:

"*The things that I am in contact with are in compliance with the policy. There are no hindrances in it related to doing our daily work*." (Rasmussen, 2006)

Discussing how the policy influences their work at the plant, he thinks that it is mainly through the procedures in the management system that this happens.

Summary related to theoretical framework

John Rasmussen has a broad understanding of the concept of environment but he *values* environmental management as an especially important aspect for Elsam as it signals that they are a healthy organisation. He *reasons* that since they implemented environmental management their image has improved. John Rasmussen finds that the *practices* at the plant are in line with the environmental policy, but the policy is not important for his work. The purchaser has a comprehensive understanding of the dynamics of the environmental effort in Elsam and *values* the work.

10.3.2 Momentum in environmental activities related to purchase

The following analyses show that the communication between the purchasers is of importance for the environmental effort of the purchaser at Skærbækværket. This communication together with the environmental management systems secures continuous improvements in the environmental practices at the plant.

The environmental initiatives at the plant are integrated in the daily practices. John Rasmussen expresses that this is important in order to keep focus on the environmental effort:

"*On a daily basis we do not think of environmental initiatives, as it is a part of our daily work, but it influences everything: what shampoo is at the shelf and where I should throw my paper*." (Rasmussen, 2006)

Related to purchasing he finds more benefits than disadvantages caused by the work with environmental management. He found it especially beneficial in the beginning where everything at the storage was to be categorised and they reduced the number of chemicals and old products. Related to the present practices in the storage he says:

"*It is an advantage for us to have environmental management because we are more in control with things. We did not have the storage order previously that we have today*." (Rasmussen, 2006)

He thinks that the environmental management system is important as it specifies the procedures that they are to follow in the daily environmental effort.

"*The environmental management system controls our environmental practices and it is the thing that has the largest influence on this*." (Rasmussen, 2006)

In the interview it is asked whether the focus area in Elsam's environmental effort has changed over time and the answer is:

"*Elsam has much more focus on suppliers today than previously. It is especially in relation to the service suppliers; they need to take their chemicals and other stuff when they leave*." (Rasmussen, 2006)

The purchaser is sometimes in doubt of how to act, in relation to both the procedures for environmental assessments of suppliers and assessing chemicals and substances at the plant. He explains how he firstly seeks help at the plant and afterwards in other plants:

"*When I am in doubt about something I talk to Erik Kristensen, and if he cannot help me I contact one in Århus that has the overall responsibility for environmental management*." (Rasmussen, 2006)

Since the merge the communication with other purchasers has become still more important for John Rasmussen, and the purchasers often help each other.

"*I talk to the other purchasers on a daily basis, previously I was all alone when it came to purchasing but since the merge I have got a lot of colleagues*."(Rasmussen, 2006)

In the purchasing group they work with projects related to specific product groups, and each purchaser is responsible for a specific project. This has created a network of knowledge that the purchasers draw upon:

"*The projects in the purchasing group have made us all specialised within certain areas, and then we know who to call to get help*." (Rasmussen, 2006)

John Rasmussen explains that the personal relations between the purchasers are important for their collaboration and he finds that the work in the purchasing group is beneficial. Another example of personal relationships being important is when it comes to contacting the central environmental department in Elsam:

"*I seldom contact the central environmental department, but we do consider Egon as one of our own, so he is easy to ask*." (Rasmussen, 2006)

Egon is an environmental coordinator in EKM who has been situated at Skærbækværket for several years and the purchasers know him.

Summary related to theoretical framework

John Rasmussen finds that the environmental initiatives are integrated in the daily purchasing *practises* at the plant, and this is positive. The environmental initiatives make his daily job easier as he has more control with the storage. The environmental management system is an especially important *artefact* for the work. He *values* the collaboration in the purchasing group as an information source for knowledge and as a place to gain new colleagues. Rasmussen *communicates* with the other purchasers on a daily basis. He *reasons* that because of the amalgamation of the power plants he gained purchasing colleagues and that has made his job easier.

10.3.3 Green procurement

The following shows that John Rasmussen is positive towards green procurement and his understanding of why it is important goes beyond the actual assessment based on the questions asked. Most of the purchasing of products goes through him as the employees find it difficult to handle the green procurement.

Asked what the result is of applying the environmental demands to the suppliers, John Rasmussen answers:

"*I do believe that the questionnaires make a difference; if the suppliers keep getting questions from different companies, they will consider whether they would have more customers if they were environmentally certified*." (Rasmussen, 2006)

This understanding of the symbolic value in the green procurement is important for his motivation as the actual assessment process seldom leads to rejection of suppliers:

"*We seldom reject suppliers based on the environmental assessment, but it happens*." (Rasmussen, 2006)

John Rasmussen is responsible for making environmental assessments of the product suppliers, but normally he is not involved in the assessment of service suppliers.

"*When we order services it is the employees that need them that order the service, as it is the employees that know what persons they need to get*." (Rasmussen, 2006)

He finds that the centrally developed purchasing agreements positively influence his work, but he still uses local suppliers as well, as some local suppliers are not included. One of the benefits that comes with the purchasing agreements is that it is easier to reject salesmen:

"It *is easier for us when salesmen call us or show up, because we can reject them by saying that the products they offer are already covered by purchasing agreements*." (Rasmussen, 2006)

Implementing green procurement has changed the way the employees purchase at Skærbækværket as the employees need to follow the procedure with approval of suppliers based on questionnaires.

"*After the implementation of the procedures more of the purchases go through me as the other employees find it to be difficult*." (Rasmussen, 2006)

John Rasmussen does not find green procurement difficult and he thinks that the suppliers get used to it as well:

"*I like using the questionnaire, it is simple and it must also be manageable for the suppliers. In the beginning some of the suppliers found it difficult but that is not the case anymore*." (Rasmussen, 2006)

John Rasmussen participated in the development of the questionnaire in the purchasing group together with the central environmental department and the process was based on a green procurement procedure that was already developed. The purchaser differentiates between setting demands for suppliers and setting demands for products. The questionnaire mainly sets demands for the environmental effort of the supplier but in the projects in the purchasing group they have another way of handling this.

"*We mainly ask about ISO certifications and such in the questionnaire, but I have been responsible for a project related to textiles in Elsam, and there I considered everything from the clothes to the laundry handling*." (Rasmussen, 2006)

He explains that the local adjustment to the questionnaire asks whether the supplier uses environmentally labelled products, and he finds this to be important. One of the projects that the purchaser participated in deals with setting demands for textiles, and reducing the number of suppliers.

"*I am in a project group dealing with textiles, we started with 120 suppliers and now we are down to 40 products, and one of the criteria is that it is labelled with the swan*". (Rasmussen, 2006)

He likes working with these projects and uses his experiences from one project in the next:

"*I'm starting up a project in the purchasing group where we work with reducing the number of suppliers of paint, and we will consider environmental issues as one of the important factors, especially related to eco- labelling*." (Rasmussen, 2006)

Asked what actually motivates the work in the purchasing groups he answers:

"*The motivation for the purchasing projects is to reduce the number of suppliers, but environmental issues are considered at the same time, and we learn a lot in this process*." (Rasmussen, 2006)

Working in a project is important for gaining environmental competencies and the experiences gained are applied in the daily work. The environmental work thereby goes hand in hand with the supplier management in general. John Rasmussen was one on the initiators for adding the question about eco-labelling into the questionnaire applied at Skærbækværket.

Summary related to theoretical framework

The *communication* in the projects in the purchasing group is important for John Rasmussens' view on green procurement. He *values* the product oriented approach that can be included through demands for eco-labelling. He *reasons* that even though they seldom reject suppliers based on the demands it sends signals to the suppliers that they react upon. The purchasing *practices* have changed at the plant as most of the purchasing now goes through Rasmussen because the other employees find the environmental assessments difficult.

10.3.4 Findings related to theoretical framework

In table 23 the findings of the purchaser are related to the theoretical framework.

Theoretical concept	Purchasing department at Skærbækværket
Emphasised practices	▪ Waste separation and other daily environmental routines. ▪ The collaboration in the purchasing group. ▪ Green procurement is centralised with the purchaser (previously the purchase was distributed amongst the employees).
Important artefacts	▪ Questionnaire for suppliers and especially demands for eco-labelling. ▪ Environmental management system with procedures that guide practices at the plant. ▪ Supplier agreements have made the daily job easier.

Reasoning	▪ The environmental certification has improved the image of Elsam since they are no longer in the press with bad publicity. ▪ The environmental management sets demands for handling the storage and therefore they have more control with it now than previously. ▪ The green procurement seldom leads to rejection of suppliers but is considered important as it signals and initiates environmental responsibility.
Values	▪ Focus on external environment and eco-labelling. ▪ The environmental effort is valued as important for Elsam. ▪ The environmental management system is valued. ▪ The environmental policy is in line with practices but is not an important value. ▪ The supplier questionnaire is important to show Elsams values to the suppliers.
Communication	▪ Frequent communication with other purchasers is important for gaining knowledge and eases the daily practices. ▪ Communication with the local environmental coordinator and central environmental department is based on a familiar atmosphere. ▪ The merging of the power plants has given the purchaser a number of colleagues and this eases his job as they exchange experiences.

Table 23 Summary of findings from interviews with the purchasers at Skærbækværket.

10.4 Conclusion

At the plant the purchaser only has limited focus on occupational health and safety as it is the environmental coordinator that mostly takes care of this aspect. That being said, external environmental issues and especially a product oriented approach have a more dominating role in the environmental effort than at the other power plants. It is interesting how separating the responsibility for occupational health and safety and external environment related to green procurement helps to keep focus on both issues.

Employee participation is an important element in the environmental effort at the plant and this has lead to a positive attitude towards the environmental effort. It is emphasised that the environmental effort consists of two main issues; the daily practices and environmental improvement projects.

The employees at the power plant have frequent interaction with peers in other power plants and with the central environmental departments, and thereby they gain environmental knowledge and acceptance of their work. This is important in overcoming the potential barrier that the environmental knowledge at the plant is limited, as the plant has chosen to prioritise the more technical skills when hiring environmental personnel. Generally speaking, communication is an important factor in the environmental effort and both the purchaser and other employees have a thorough understanding and acceptance of the dynamics in the environmental management system. The acceptance of the environmental effort is important and has lead to positive values towards the environmental effort, and ownership of the improvement projects that the employees are working at.

As a final comment the employees at the plant seem to be positive towards new initiatives and during several visits at the plant I received only positive feedback from the employees and they showed a genuine interest in my work.

Reflections and recommendations for future implementation strategies:

- Collaboration in projects with peers (in this case in the purchasing group) is an important way of gaining knowledge.
- The product oriented focus in green procurement can easily be implemented by focusing on existing tools e.g. environmental labels.
- Employee participation makes it easier to change practices and sustain a positive attitude towards the environmental effort.
- The environmental management system becomes a strong tool for securing dynamics in the environmental effort if the employees are involved in the implementation.
- Separating the responsibility for occupational health and safety and external environment related to green procurement helps to keep focus on both issues.

Perspective
It could be beneficial to introduce a dynamic approach in the assessment of suppliers so that action-plans are developed for the suppliers that are rejected in the environmental assessment in order to make them comply with the demands instead of rejecting them.

When green procurement is implemented it might be beneficial to look into further development of the supplier management either by collaborating with suppliers in order to improve their environmental performance or through collaborations concerning green innovations at the power plants.

References for chapter 10

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Elsam (2006a): Safety and Environmental handbook for Skærbækværket, Elsam 2007

Elsam (2006b): Safety- and Environmental instructions for craftsmen (external) at Skærbækværket.

Elsam (2006c): Brochure describing Skærbækværket and its operations, Elsam 2006.

Elsam (2006d): Safety- and Environmental demands for craftsmen (external) at Skærbækværket.

Elsam (2006e): List of approved and deselected suppliers for Skærbækværket.

Elsam (2006f): Material concerning occupational health and safety at the plant.

Kristensen (2006): Interview with local environmental coordinator Erik Kristensen at Skærbækværket, 9/10- 2006.

Rasmussen (2006): Interview with local purchaser John Rasmussen at Skærbækværket, 7/10- 2006.

11 Enstedværket

The purpose of this chapter is to analyse the lifeworlds and subcultures related to green procurement practices at Enstedværket. The main characteristics related to the subculture are identified, and it is investigated how these affect the implementation of green procurement. The analyses are split into four main sections: Firstly the plant is presented with a focus on their organisational and environmental profile. Secondly the environmental effort at the plant is analysed from an environmental coordinator's perspective which, in the third section, is supplemented with an analyses of the purchaser's view on the environmental effort at the plant. After each section there is a short discussion of the findings, and they are related to the theory applied for the analyses. Finally, as a conclusion, the main characteristics of the organisational culture related to the environmental effort at the plant are related to each other.

Enstedværket (Dong Energy, 2007a)

The empirical knowledge for the analysis is based on the following material:

- Interview with the environmental coordinator, Christian Mehlsen 4/1-2007
- Interviews with the two local purchasers Jytte Fenger and Joan Andersen 4/1-2007
- Interview with a central purchasing manager, Erling Chr. Carlsen situated at the plant 04/01/2007
- Green account from the plant (2004, 2005 and 2006)
- Brochure introducing the plant, 2006
- Purchasing procedures from the environmental management system
- Safety- and Environmental instructions for craftsmen (external) at Enstedværket
- Internal e-mail correspondence handed out by the interviewed employees

Besides the material listed above the analysis is inspired by general knowledge about Elsam built up through 4 years of work with the innovation consortium in CEMIP.

The quotes from the interviews are translated from Danish. The empirical data has not been updated since the merge in 2007 and the establishment of Dong Energy.

11.1 Company characteristics and environmental profile

Enstedværket has close to 150 employees and was taken into operation in 1922. Traditionally the main fuels used for producing heat and power were coal and oil but in the late 90's a new plant was built at the site that combusts straw and wood chips. (Elsam, 2006)

The plant has a capacity of more than 500MW combined heat and power. (Dong Energy, 2007a) How much the plant produces each year is related to the liberalized electricity market, and therefore related to the supply of electricity from other sources e.g. wind energy and the amount of energy produced from hydroelectric plant in northern Scandinavia.

Straw at Enstedværket

Enstedværket has a vision that is closely related to the centrally developed environmental vision in Elsam.

"*Production and business development are based on awareness of the environment. The installation of a bio fuel incinerator is an example of this."* (Dong Energy, 2007a)

A brochure presenting the plant mentions the flue gas cleaning system as an important environmental initiative, as it reduces the emission of SO_x and NO_x. (Elsam, 2006)

11.1.1 Environmental management system

Enstedværket is certified according to ISO 14001, OHSAS 18001 and ISO 9001. In the green account the central environmental policy for Elsam is presented (See section 6.3). In order to fulfil the environmental policy Enstedværket sets local targets each year. As illustration of the kind of targets, the environmental target areas from 2006 are presented below. (Dong Energy, 2007a)

Environmental goals for Enstedværket, 2006:

- Reduction of the internal use of electricity
- Optimisation of the management of suppliers
- Reduction of the number of occupational injuries

The second target deals with management of suppliers. The content of this target is, according to the purchasers, mainly to reduce the number of suppliers without an environmental approval. Employees who order services are educated in the use of the environmental approval. (Andersen, 2007)

The plant has an intranet where relevant information and documentation related to the work with occupational health and safety and external environment can be found. The employees have access to the intranet and use it both for gaining information (e.g. safety data sheets) and to register data or incidents. The plant is trying to make the intranet as simple to use as possible, leading to several changes in the environmental management handbook. (Dong Energy, 2007a)

11.1.2 The structure of environmental work

The environmental department has one employee who coordinates the environmental work at the plant, and involves purchasers in the environmental initiatives. Enstedværkets environmental coordinator is part of the AMSG (Danish abbreviation for "Occupational health and safety and environment group"). He is responsible for the environmental management system at the plant. One third of his working hours are spent on work with the external environment, one third on work with occupational health and safety and the last third with other issues. (Mehlsen, 2007)

The environmental management system was implemented at a time when there was an environmental group at Enstedværket, but this group has since then split up because they felt that they lacked any real authority. Today the environmental coordinator has the primary responsibility for implementing new initiatives, but he does so in collaboration with a web-manager that is responsible for the plant's environmental homepage. (Mehlsen, 2007)

The procedure for green procurement is adopted directly from the centrally developed procedure, and local adjustments are not made. The same goes for the environmental questionnaire for the suppliers. (Mehlsen, 2007)

The purchasers are responsible for the green procurement but they collaborate with the environmental coordinator when in doubt. There are two full-time purchasers at the plant, however, all employees are allowed to purchase if they secure that the suppliers are approved in the purchasing system. (Mehlsen, 2007)

For a supplier of products to be approved an investigation including environmental, economical and quality aspects is conducted by the two full-time purchasers. The employee who orders the service is responsible for the approval of these suppliers. (Mehlsen, 2007)

11.2 The environmental department

The environmental coordinator was originally educated as a mechanical engineer but has later taken an education in safety management; he does not have any specific education related to his responsibility for the company's management of the external environment. He is responsible for both occupational health and safety and external environment, including the implementation and update of the environmental management system. (Mehlsen, 2007) The coordinator has worked in Elsam since 1991 and was originally hired as a mechanical engineer, in 2000 he became safety coordinator and finally also environmental coordinator in 2002. (Mehlsen, 2007)

The AMSG meets on a regular basis and the coordinator receives most of his environmental inputs at these meetings. It was also through the AMSG that green procurement was introduced. The coordinator finds that the collaboration with the central environmental department is beneficial, and that they are positive even when asked seemingly silly questions. However he stresses the need for a centrally positioned environmental manager who can develop the vision for the environmental initiatives in Elsam, as the employees both centrally and locally are busy with their daily practices and do not have the surplus resources to do so. (Mehlsen, 2007) The main collaboration with the central department relates to development of the green accounts. The central department also delivers updates to the environmental management system and informs about new legislation. (Mehlsen, 2007)

Summary related to theoretical framework

The AMSG is important for the environmental coordinator (Christian Mehlsen) as new initiatives in Elsam are presented in this group. Through this *communication* he gains environmental inputs. Technical competences are *valued* together with competences within the field of health and safety as the environmental coordinator is an engineer and safety manager.

11.2.1 Environmental understanding

The analysis in the following section shows that the environmental understanding within the environmental department embraces both health and safety and the external environment, but the responsibility of the external environment is not addressed locally.

Christian Mehlsen defines the concept of environment as:

"The concept consists of two things; internal and external environment. The external environment is how we impact the surroundings." (Mehlsen, 2007)

They apply the term "internal environment" to occupational health and safety. The environmental coordinator focuses on occupational health and safety when describing environmental initiatives. Occupational health and safety gains most of the awareness:

"We focus on occupational health and safety and I think that it has taken the steam out of the environmental effort." (Mehlsen, 2007)

This is in line with his responsibility for both perspectives. He perceives the occupational health and safety problems as the most important for the plant:

"At Enstedværket the most important environmental impact is the internal environment especially dust and noise. Then there are the CO2 emissions, and it is a big task for Elsam to reduce that." (Mehlsen, 2007)

Christian Mehlsen has a clear distinction of what important impacts are from the local plant, namely occupationally health and safety, whereas e.g. CO2 reductions are a task for the central environmental department in Elsam.

"It is only the handling of the local environmental impacts that is important for my work." (Mehlsen, 2007)

The term "local environmental impacts" is used as a synonym for occupational health and safety during the interview. They focus on occupational health and safety at the plant and they assign a lower priority to work concerning the external environment.

Summary related to theoretical framework

Protecting health and safety is a dominant *value* for the environmental coordinator whereas external environment has limited focus. The *reasoning* is that the important external environmental impacts are the responsibility of the central environmental department.

11.2.2 Momentum in environmental activities

The following analysis shows that the central environmental policy and management system has limited influence on the momentum of the environmental activities at Enstedværket; the locally developed goals and action plans guide the environmental practices.

Previously there have been café-meetings at the plant to inform about aspects of the environmental activities in Elsam such as the environmental homepage on the intranet and legal demands. The coordinator believes that it is difficult for the employees to use the homepage because they do not use it as a part of their daily practices and therefore they do not have enough experience with it. The coordinator thinks that it would be beneficial to have more meetings where the employees are informed about environmental issues, because they do not use the environmental handbook and the procedures very often. (Mehlsen, 2007)

Asked about how environmental initiatives are initiated Christian Mehlsen answers:

"*It is primarily the AMSG that initiates environmental initiatives, they are not initiated locally. Locally it is the environmental management system that gets the new tasks started."* (Mehlsen, 2007)

Thereby the coordinator finds that it is the responsibility for the central environmental department to initiate new initiatives, related to the external environment. The responsibility at power plant level is to set environmental goals, include them in the management system and thereby start the implementation. He believes that if it is a goal in the management system, then it changes the practices. On the other hand he finds that the environmental policy is not guiding the environmental targets that are set locally. This is illustrated in his answer to a question related to the coherence between the environmental policy and the practices at Enstedværket:

"*I think that some power plants work goal-oriented in order to follow the environmental policy, to others, including this plant, it is too abstract. When we make our priorities and set goals, we do not consider the environmental policy very much. The environmental policy is applied centrally, we work with projects. It is the action plan that links it together."* (Mehlsen, 2007)

Later in the interview he also finds that the environmental policy is too abstract and he believes that this is the reason why 90% of the employees do not know the environmental policy and the values that it shows. (Mehlsen, 2007)

Related to the general attitude towards working with environmental matters at the power plant he says that:

"*I think that a small group of the employees finds us "saved" when it comes to environment; we do too much. When it all started we initiated a number of initiatives, but the employees did not get the point until we showed the reductions in electricity use and savings in water consumption. For most of the employees the environmental initiatives are very abstract*." (Mehlsen, 2007)

During the interview Christian Mehlsen emphasises that it is important for the employees to feel that their work with environmental initiatives makes a difference and it is most obvious for them, when it comes to occupational health and safety. The improvements related to external environment are more abstract. As an example the employees find it difficult to understand the purpose of asking for environmental policies and management systems in green procurement whereas demands related to occupational health and safety are easier to comprehend as they have to meet the same demands in their daily work. (Mehlsen, 2007)

Summary related to theoretical framework

The central *values* in Elsam are not important for the environmental momentum at the plant, as the coordinator *reasons* that it is the responsibility of the central environmental department to develop the policies, and the policy is to abstract for employees to relate to. The local *values* are represented in the targets and development of action plans; and in the implementation of these the *practices* of the plant changes. Together with the goals and action plans, a homepage containing environmental information are the important *facts* for the environmental momentum at the plant. Previously there have been café meetings for the employees at Enstedværket but the *communication* regarding environmental issues is limited. The environmental coordinator mostly *communicates* with the central environmental department regarding data for green accounts. He gains most of his environmental inputs from frequent interactions in the AMSG.

11.2.3 Green procurement

The analyses in the following section shows that from the environmental coordinators point of view the green procurement does not lead to actual changes in the environmental performance of the plant, and therefore the employees do not understand the necessity of the procedure.

The environmental questionnaire for the suppliers prepared at central level is applied directly at the power plant and no locally formulated demands are added. There has not been any formalised meeting where the assessment procedure was introduced. Information is given ad hoc when the purchasers have questions. (Mehlsen, 2007)

Christian Mehlsen finds that the environmental assessment procedure makes it easier to secure compliance with the legal demands, especially when it comes to occupational health and safety. (Mehlsen, 2007)

"*Sometimes employees buy products without securing that they are approved in our systems. It might be because of old habits, but when we have discussed with them and they keep doing it, then it is a provocation."* (Mehlsen, 2007)

The coordinator explains that most of the employees find that the green procurement is mostly a hassle and that they do not know why it is necessary (Mehlsen, 2007). The limited understanding leads to incidents where the employees accept free samples from suppliers, even though they are not approved in the system. (Mehlsen, 2007)

The assessment of suppliers of products has been a focus area for a long time, but the environmental coordinator believes that there are other target areas with greater environmental improvement potential. (Mehlsen, 2007) He is not of the perception that assessments actually lead to real changes:

"*The supplier evaluation schemes are mostly administrative; we have never rejected anyone on the basis of them*." (Mehlsen, 2007)

However, they do sometimes reject entrepreneurs (suppliers of services) on the basis of the demands for occupational health and safety.

Christian Mehlsen does not believe that the evaluation schemes lead to changes in the practices of the suppliers. Actually he thinks that some of the suppliers do not even read the questions but just answer "yes" to all of them. He is not in direct contact with the suppliers but is mostly involved if there are misunderstandings that the purchasers do not know how to handle.

Suppliers of services that work at the plant are allowed to use chemicals that are banned in Elsam, as long as the chemicals are legal and the suppliers remove the surplus. The coordinator gives an example of epoxy paint that is not approved in Elsam, but the suppliers can none the less use it at the plant. The opposite is the case when it comes to other demands for occupational health and safety, where the same rules cover suppliers of services as well as internal employees. (Mehlsen, 2007)

The coordinator explains how some of the relevant environmental demands are not incorporated the purchasers are not aware of the potential environmental impacts. An example is electrical products and cars, where the energy consumptions are not considered. (Mehlsen, 2007) This example is especially interesting because Enstedværket has had goals for reducing their energy consumption for several years.

Summary related to theoretical framework

The purchasers are responsible for the *practices* related to conducting supplier evaluations, but there is only ad hoc collaboration with the environmental coordinator.

The environmental employee *reasons* that as the environmental demands do not lead to any real improvements, the employees do not understand their necessity. Therefore some of them have a *practice* of purchasing from suppliers without an environmental approval. An important *fact* for the green procurement is the purchasing procedure that is adopted without local adjustments.

11.2.4 Summary related to theoretical framework

In table 24 a summary of the findings related to the environmental coordinator is presented.

Theoretical concept	Environmental department at Enstedværket
Emphasised practices	▪ The purchasers conduct supplier evaluations. ▪ Café-workshop for employees. ▪ Informal collaboration between purchasers and environmental coordinator. ▪ Some employees purchase without conducting supplier evaluations.
Important artefacts	▪ Supplier evaluations adopted without local adjustments. ▪ Intranet containing environmental homepage interface. ▪ Environmental management system with goals and action plans (guide behaviour opposed to policy).
Reasoning	▪ Employees find environmental policy abstract and therefore it is ignored. ▪ Difficult for employees to understand the reasoning behind environmental initiatives therefore they do not find them important. ▪ If it is a goal in the management system, then it changes the practices. ▪ Environmental demands for suppliers do not lead to actual improvements therefore employees do not understand their necessity. ▪ Due to previous working accidents the demands for occupational health and safety are found to be important. (visibility)
Values	▪ The environmental policy is not important, the goals in the environmental management system are. ▪ Occupational health and safety has first priority (external environment second). ▪ Improvement of supplier management is a goal in the environmental management system. ▪ Technical competences are valued together with competences within the field of health and safety as the environmental coordinator is an engineer and safety manager.
Communication	▪ Limited communication with EKM, mostly related to providing data for green accounts. ▪ Positive attitude centrally, also when asking “silly” questions. ▪ Frequent interaction with the AMSG. ▪ Informal and ad hoc communication with purchasers.

Table 24 Summary of findings from interview with the environmental coordinator at Enstedværket.

11.3 The purchasing department

In the purchasing department there are two full time purchasers. They are responsible for managing the store, making purchasing and service agreements, handling contact with suppliers for the canteen and cleaning and preparing data for green accounts. The two purchasers have worked in Elsam since 1999 and 1994 respectively. (Andersen, 2007) and (Fenger, 2007)

The purchasers are responsible for supplementing the storage and ordering services. Small orders are made by the employee who needs the product or the service. (Andersen, 2007) Another task is keeping track of invoices and assigning them to the correct projects. (Fenger, 2007) When other employees at the plant purchase either services or products they call the purchasers to get the ordering numbers. This makes it possible for the purchasers to secure that only environmentally approved suppliers are used. (Fenger, 2007)

The purchasing department is placed in the office building at Enstedværket, but they have planned to move it to the storage, so that they are in closer contact with the employees who order products for the plant. (Fenger, 2007)

11.3.1 Environmental understanding

The analyses in the following shows that the purchasers focus on occupational health and safety and that they are responsible for the supplier evaluations at Enstedværket.

Both purchasers find that there is limited focus on the environmental effort in Elsam and their main connection between Elsam and environmental issues is related to the supplier evaluations. None the less one of them has a broader understanding when explaining the concept of environment:

"*It is everything from separating paper from other waste to reduction of chemicals and likewise."* (Andersen, 2007)

The purchasers find that their work with green procurement has made them more aware of environmental issues, and especially the work in project groups focusing on specific product groups has been important in this process:

"*We have become increasingly aware of environmental issues because we are working with it, we know much more than we knew before. By participating in projects it becomes easier to see the purpose with environmental initiatives, but it can be difficult for e.g. the blacksmith at the storage to understand it*." (Andersen, 2007)

They explain how the project work influences both their motivation for working with green purchasing but also their perception of environmental effort in Elsam in general. Asked whether they see Elsam as a polluting organisation the answer is:

"*Elsam works to reduce the environmental impacts, we do not pollute as much as people think*." (Fenger, 2007)

Even though the purchasers participate in project groups focusing on reducing the environmental impacts from products, the purchasers find that occupational health and safety is the most important environmental initiative in Elsam:

"*It is occupational health and safety; making sure that the suppliers are approved, so that we do not get a lawsuit at our hands when somebody gets hurt. We spend a lot of time on that."* (Fenger, 2007)

Enstedværket has a history with several work-related injuries, and therefore it is understandable that the purchasers focus on this. This also shows in the answer to why it is important for Elsam to reduce the environmental impacts from the production of electricity, as they point out that the environmental effort is important:

"*Environmental effort has become a natural element, even though we produce electricity and not services, we are interested in that people want to buy our products*." (Fenger, 2007)

The purchasers agree that there is limited focus on the environmental incentives in Elsam are, they only know something about the aspects they work with themselves. The purchasers do not know the environmental policy and one of them says:

"*I hand it out in leaflets to the external service suppliers but I never read it, it is a bit embarrassing*." (Fenger, 2007)

Due to the limited focus on the external environment at the plant, the purchaser says:

"*I think that there need to be focused on environmental effort or else it fades out*. " (Andersen, 2007)

Summary related to theoretical framework

The purchasers have a broad understanding for environmental issues due to participation in purchasing groups. This *practice* has made them *value* environmental issues, but it does not seem to be anchored in their *practices* besides the appliances of questionnaires. The purchasers *value* occupational health and safety higher than external environment as they *reason* that the "internal environment" is the most important part for the power plant.

11.3.2 Momentum in environmental activities related to purchasing

The purchasers have three main activities that are related to environmental effort; making supplier evaluations, explaining to the employees why they have to use suppliers that have an environmental approval and participating in purchaser groups. When asked where the purchaser mainly gains her information related to environmental effort she answers:

"I participate in a group that is called "Reduction of chemicals and substances", where we have reduced the number of different paints used at the plants. I learn a lot from working with this" (Andersen, 2007)

She finds that it is an important task to make the employees understand why they should reduce the number of chemicals, because she generally feels that there is resistance towards this, as the employees need to use new products. (Andersen, 2007)

"We spend a lot of time explaining to the employees why we have to reduce the number of chemicals being used and the number of suppliers, we do this in order to make them understand, so that they do not oppose it." (Andersen, 2007)

The other purchaser has the same kind of reasoning:

"*Some of the employees are opposed to our work, but most of them understand the point. The employees have been used to buying whatever they wanted but now there are limitations."* (Fenger, 2007)

The purchasers explain that it is difficult to be in this position, where they both have to conduct the green procurement and explain to the employees why they do so. They are sometimes in doubt about how to handle it, because their environmental competences are limited, and therefore they do not always know how to explain the rationale behind green procurement to the employees. (Andersen, 2007) and (Fenger, 2007).

One of the purchasers gives an example of a situation where she finds the rules for green procurement difficult to understand, but on the other hand she insists on following the rules.

"*Even correction fluid requires labelling and that is difficult to understand and not just for the employees but for everyone. We tried to find one that is water-based. When there is a procedure you have to follow it, we can not just slacken the demands*." (Fenger, 2007)

The rules that the purchaser is talking about are coupled to the environmental certification:

"*We set demands for the suppliers; when you have an environmental certification you have to follow certain rules.*" (Fenger, 2007)

The purchasers explain that the employees resist the supplier evaluations, because previously they were free to buy from whoever they wanted. The purchasers help the employees when they are buying products, but they feel that it is not enough:

"What is needed is a change in attitude, but I think that it takes a long time." (Fenger, 2007)

She feels that it is the responsibility of the management to create a positive attitude towards the changes that the restrictions for use of suppliers have generated:

"*Changing the attitude should come from the management, or else the attitude can not rub off on the employees. I feel that it is a problem that the management could support the environmental initiatives more*." (Andersen, 2007)

Several times through the interviews the limited support from the management relating to environmental issues are mentioned:

"*Our top manager told us that everything can not be focused on environmental demands, and there must be room for the small suppliers, that makes it difficult for us to enforce the rules. The supplier he was talking about was even one providing hands and legs (services red.)."* (Fenger, 2007)

The confusion about when to use the suppliers and when to reject them is not the only hurdle for the purchasers, they actually feel that their competences are questioned by the employees when it happens:

"*We spend a lot of time telling the employees what suppliers they can use and why, and then the suppliers suddenly are approved anyway, that puts us in an unpleasant position, and they think that we are the ones that do not know what we are doing*." (Fenger, 2007)

During the interviews it was discussed whether the purchasers thinks that these barriers were also present at the other power plants, and one of them said:

"*When we tell other purchasers in the project group dealing with chemicals and substances what happens down here, they shake their heads*." (Andersen, 2007)

The purchasers both gain environmental knowledge and support from the purchasing project groups and this is beneficial for their work with green procurement.

Summary related to theoretical framework

The environmental certification is an important *fact* for the environmental initiatives as it sets demands for it and these demands are *valued* by the purchasers. The purchasers *reason* that the limited focus on environmental issues from the management and limited environmental *communication* leads to a negative attitude amongst the employees, and therefore they resists the limitations that the environmental approval of suppliers create. An important *communication* channel for the purchasers is the project groups where they share experiences with other purchasers.

11.3.3 Green procurement

The following shows that the purchasers are positive towards the environmental effort but that they need clear directions for how to manage the demands in the supplier evaluations, They find that it is the responsibility of the managers to set these directions.

The purchasers see a clear distinction between suppliers of services and suppliers of products when it comes to using the centrally developed purchasing agreements. Economy is an important factor for choosing other suppliers than those included in the central agreements:

"*Around 40% of our purchase of products is with suppliers included in purchasing agreements. We use other suppliers if they are cheaper*." (Andersen, 2007)

They often choose suppliers of services that are included in the purchasing agreements:

"*Most of the purchase of services is with suppliers that are environmentally approved and often with central purchasing agreements*." (Andersen, 2007)

Initially the purchasers both made environmental assessments of the suppliers of products and services, but this has changed over time.

"*To begin with we sent the questionnaire to all our suppliers, both suppliers of goods and services, now we only send it to the service suppliers*." (Fenger, 2007)

In general the purchasers seem positive towards the procedure for environmental approval including the questionnaire, as it is an easy way for them to make sure that they ask the right questions.

"*I like using the questionnaire but we need clear guidelines on how to use them*." (Andersen, 2007)

There have been episodes where suppliers are approved by the management even though they do not fulfil the demands in the green procurement procedure, and that makes the purchasers ask for clear guidelines on how to approve suppliers.

"*Sometimes the suppliers need to have four points to be approved, sometimes they need less, and it is the management that decides that*." (Fenger, 2007)

When the suppliers that they use frequently do not comply with the demands in the procedure for environmental approval, the purchasers ask the management to decide whether to use them or not:

"*Some of the suppliers are still not approved, but the case is placed with one from the management and nothing happens. We keep on using the supplier until we are told otherwise*." (Andersen, 2007)

Joan Andersen explains that economical considerations are given higher priority than the environmental approval and this leads to confusion:

"*We had a case with a supplier where the organisation with environmental approval was much more expensive, but then the management decided that we could use the supplier that did not have a high enough score. We really need clear directions*." (Andersen, 2007)

The confusion of how to prioritize economy and environmental issues are not the only hurdle, as the purchasers feel that there has been too little introduction of the questionnaires:

"*I do not think that the introduction of how to use the questionnaires has been sufficient, we are often in doubt when the suppliers ask us how to answer them*." (Andersen, 2007)

Another barrier that Jytte Fenger has to deal with is the lack of response from the suppliers:

"*A lot of companies do not answer when we send the questionnaire, but I started sending it again with a notice saying, that they have to answer, if we are to purchase from them in the future*." (Fenger, 2007)

The questionnaire actually makes a difference, as there are some cases where the suppliers have changed their practices in order to meet the demands from Enstedværket:

"*We had a supplier that did not comply with the demands and the supplier had Occupational Health Service helping them with changing the practises so that they comply; thereby the demands made a difference*." (Fenger, 2007)

The purchasers also explain how the suppliers have a positive attitude towards the demands in the questionnaire:

"*Generally the suppliers are positive towards the demands, they find them relevant, but in the beginning the small suppliers did call to make sure that they understood them correctly*." (Andersen, 2007)

The purchasers explain that they are not always capable of answering the suppliers' questions.

"*When we are in doubt of what to do, we ask the environmental department, then they can decide, also if we think that the supplier did not understand the questions*." (Fenger, 2007)

As a facilitator for the green procurement the purchasers would like a database where they could see which suppliers are environmental approved all over Elsam.

Asking the purchasers if there are examples where important environmental impacts are not covered the answer is:

"*We do not ask about the energy consumption when buying e.g. monitors*." (Andersen, 2007)

Asking the purchasers whether they consider their internal goals in the environmental management system they answer that they do not know what the goals are. After being told that one of these goals is to reduce the internal energy consumption they were quite surprised that they did not know, as they buy a lot of electronic devises. The lack of product oriented demands are discussed, and asking whether there is a life cycle perspective when setting environmental demands for suppliers the purchaser answer:
"*When we work in projects e.g. related to chemicals and substances we do include that perspective e.g. related to carcinogenic substances. We do not do that on a daily basis when we purchase products."* (Andersen, 2007)

Summary related to theoretical framework

The dominant *artefact* is the procedure for green procurement. They have a *practice* of sending questionnaires to all suppliers, and follow up if they do not answer. The management sometimes approves suppliers that do not comply with the environmental demands, and therefore the purchasers *reason* that they need clearer directions on how to assess the suppliers. An important *practice* is the purchasers using the centrally developed purchasing agreements. As the purchasers have limited environmental knowledge the *communication* with the environmental coordinator is important. The purchasers are aware that some important environmental impacts are not covered by the questionnaire, but *reason* that they do not have the competences to determine these demands and therefore the standardised questionnaire is a good solution.

11.3.4 Summary related to theoretical framework

In table 25 is presented a summary of the findings in the purchasing department related to the theoretical framework.

Theoretical concept	Purchasing department at Enstedværket
Emphasised practices	▪ The purchasers spend time explaining to the employees why there are restrictions on which suppliers to use because of environmental demands. ▪ The purchasers send environmental questionnaires to all service suppliers and some suppliers of products.
Important artefacts	▪ Centrally developed questionnaire for suppliers ▪ The environmental certification sets the demands for the green procurement ▪ 40% of the product suppliers are included in the centrally developed purchasing agreements.
Reasoning	▪ There is no clear guide for when to prioritise economy higher than environment therefore the purchasers let the management make this decision. ▪ The management has limited focus on environmental issues therefore the attitude amongst the employees is not as positive as it could be. ▪ The employees do not understand why there are restrictions on the use of suppliers therefore they resist it. ▪ If the employees are informed about environmental matters then they are more open-minded towards new initiatives. ▪ Due to limited environmental knowledge the purchasers put the responsibility for green procurement on the environmental department or the management when in doubt. ▪ Suppliers change their practices; the questionnaire makes a difference. ▪ The purchasers know that some important environmental impacts are not covered by the questionnaire, but they do not consider these when purchasing, as they stick to the procedure.
Values	▪ The purchasers find occupational health and safety more important than external environment. ▪ Experiences from work in project groups make the purchasers value environmental issues. ▪ The purchasers value compliance with rules; they do as they are told. ▪ The purchasers value procedures and clear guidelines.
Communication	▪ Participating in a group of purchasers that have the purpose to reduce the number of chemicals at the plant has made them more aware about environmental issues. ▪ The questionnaire has not been introduced thoroughly enough to the purchasers. ▪ The purchasers ask the local environmental department for help when in doubt of issues in green procurement, this seldom happens. ▪ Frequent interaction with other purchasers concerning green procurement in project groups. ▪ The purchasers have started sending reminders to the suppliers that did not answer the questionnaire; this has created dialogue with the suppliers.

Table 25 Summary of findings from interview with the purchasers at Enstedværket.

11.4 Conclusion

The emphasis in the environmental effort at the plant is the focus on occupational health and safety. Both the purchasers and the environmental coordinator lack environmental education. This means that the work related to external environmental issues are mainly based on the specific rules and goals in the environmental management system. As a positive side of this the purchasers know who to ask in case of doubt and are not afraid to do so.

One of the main barriers for the implementation of green procurement is the limited support from management (they counteract the procedures due to economic considerations). The main driver is a positive attitude towards environmental initiatives from both the purchasers and the environmental coordinator, but they feel that this is not shared by all other employees.

Both the purchasers and the environmental coordinators have a pragmatic view on the environmental effort; if it is not a part of the demands for the plant then it should not be questioned (e.g. goals in the environmental management system). They do not consider other environmental demands for the products they buy, even if they know that important environmental impacts are not covered, but base their assessments on the questionnaires. There is a lack of a tool that the purchasers can use when the suppliers do not comply with the demands in the questionnaire, this could, for example, be a development of action plans to secure future compliance. Thereby the purchasers do not have to skip local suppliers that are willing to improve, and that they have a tradition for collaborating with.

Differences between the appliance of reasoning and the values in the environmental and purchasing departments are mainly related to the experiences with the questionnaires for suppliers; where the coordinator finds that there are clear guidelines the purchasers are often in doubt. The purchasers do not see themselves as responsible for implementing the supplier evaluations; it is a top-down procedure and they do as they are told. This is not the case when it comes to the project groups where they are active in the development of the demands for the suppliers of chemicals and substances.

Reflections and recommendations for future implementation strategies:

- A decentralisation of the responsibility for implementing and making local adjustments for green procurement would be preferable; making it the responsibility for the managers of the power plant to set clear directions. Thereby there would be less conflict between the demands in the procedure and the decisions made by the managers.
- The local implementation of the procedure also facilitates the purchasers feeling ownership of the green procurement.
- The purchasers need education to understand the reasoning behind the green procurement. This might facilitate that important environmental impacts, not included in the questionnaire, would be prioritised. (Initiate bottom-up dynamics)
- The purchasers need tools to collaborate with suppliers in order to make them meet the demands instead of a black and white rejection or approval.
- Formal introduction of the questionnaire secures that the purchasers understand the rationale for green procurement.
- Product oriented demands for specific product groups e.g. electronic devices would help the power plants in compliance with their environmental goals. This approach is also in line with other demands for products e.g. quality and price that are normally included in procurement.
- The purchasers need clear guidelines especially when they lack environmental education.
- Action plans in order to make suppliers improve their environmental performance is a possibility, especially for suppliers that do not comply with the environmental demands.

References for chapter 11

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Elsam (2007b): Safety and Environmental handbook for Enstedværket, Elsam 2007.

Elsam (2007c): Safety- and Environmental instructions for craftsmen (external) at Enstedværket. Elsam 2007.

Fenger (2007): Interview with local purchaser Jytte Fenger at Enstedværket, 4/1- 2007.

12 Project department

The purpose of this chapter is to describe and analyse green procurement in larger projects in Elsam. The main characteristics related to the subculture in the department are identified, and it is investigated how these affect the implementation of green procurement.

Firstly the procedure for green procurement in projects in Elsam is introduced and afterwards focus is turned to the environmental initiatives, focusing on the environmental assessment of projects, especially green procurement. Lastly, as a conclusion, the main characteristics of the organisational subculture related to the environmental effort are described.

The analysis is primarily based on the following material:

1. Interview with project manager, Poul Jacob Vilhelmsen 7/10-2006
2. Interview with project manager, Robert Hvelplund 7/10-2006
3. Interview with advisory project manager, Marius Noer 6/10-2006
4. Procedure for environmental and occupational health and safety assessment from Environmental management handbook, EKM.
5. Procedure for supplier assessment relating to tenders. Environmental management handbook, EKM.
6. Template for improvement projects. Environmental management handbook, EKM.

The quotes from the interviews are translated from Danish. The empirical data has not been updated since the merge in 2007 and the establishment of Dong Energy.

12.1 Organisational characteristics and environmental profile

The project department is a part of Elsam Engineering and, as the name indicates, they manage large projects in Elsam. There are approximately 100 employees with 6-7 product managers and one advisory project manager in the department.

The projects in the department can both be national, e.g. modernisation of power plants and development of new technologies, and international, e.g. building power plants abroad.

12.1.1 Environmental management system

Elsam Engineering is not certified according to ISO 14001 but none the less they have an environmental handbook and work after the same procedures as the rest of Elsam.

In the environmental management system the procedure for environmental approvals of projects is specified. Figure 29 illustrates the flow of the environmental assessment procedure.

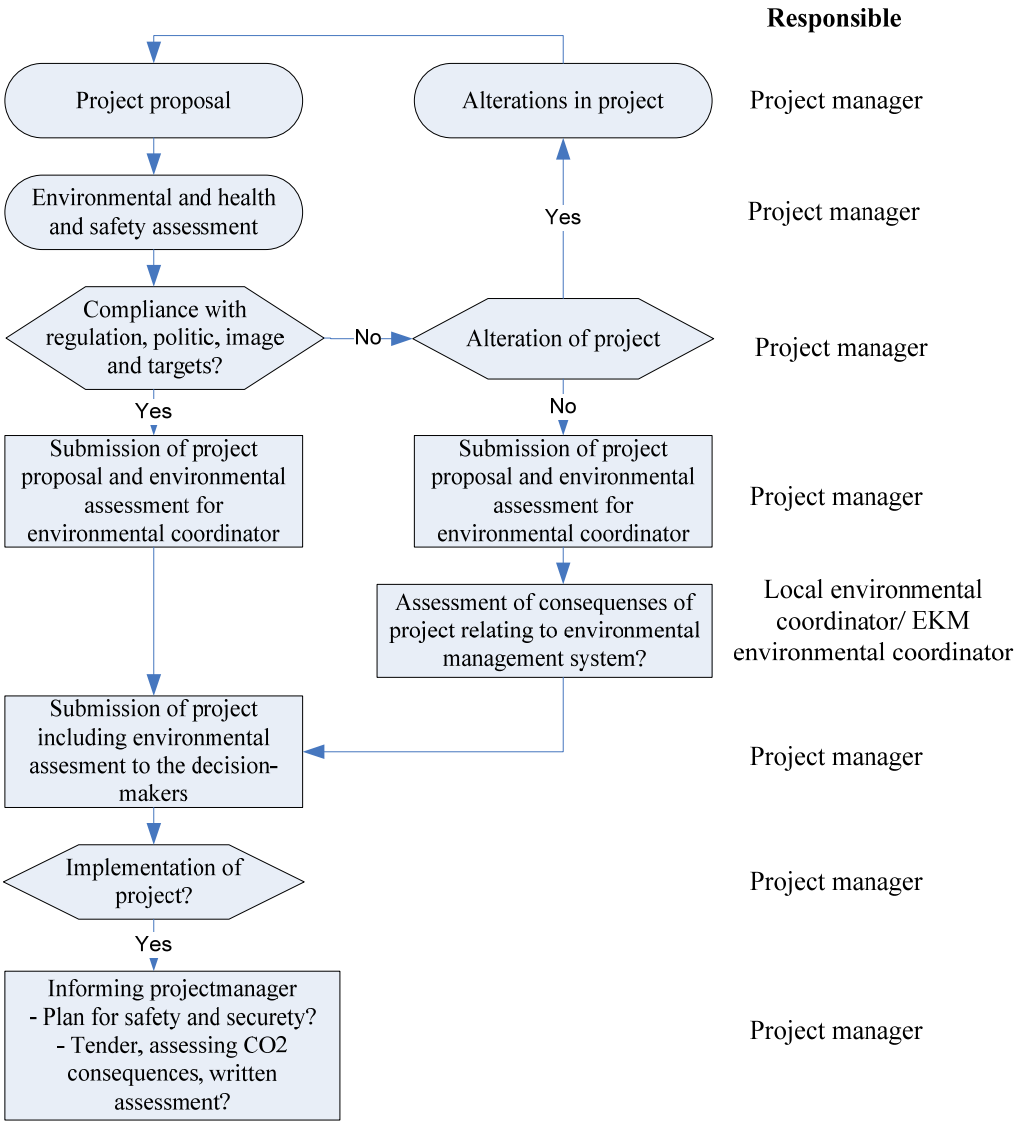

Figure 29 Environmental assessment of projects (Translated from Elsam, 2005a).

When a new tendering is initiated the project is assessed following the procedure illustrated in figure 29. The environmental assessment includes the following assessment criteria:

- Future and present legislation
- The project's connection to Elsam's environmental policy
- The environmental and occupational health and safety impacts from the project
- Explanation of potential impact on environmental issues included in Elsam's reduction targets.
- The environmental and occupational health and safety impacts (positive and negative) of implementing the project. (For Elsam, the society and other relevant comparisons.)
- Whether the project is image creating for Elsam
- The environmental and occupational health and safety impacts from operation and maintenance. (Elsam, 2005b)

If the project interferes with point 1, 2, 4 or 6 it has to be revised so that it is not in conflict with the assessment criteria.

12.2 Project managers

Two project managers, namely Robert Hvelplund and Poul Jacob Vilhelmsen and one advisory project manager, Marius Noer were interviewed for the analysis.

Robert Hvelplund has been working in Elsam for almost 30 years and has a bachelor of engineering from Aalborg University. He is project manager for projects concerning modernisation of control systems at the central power plants in Elsam. Typically there are 20-30 employees involved in each of the projects.

Poul Jacob Vilhelmsen is project manager of a project working with extracting the CO_2 from the flue gas called the RENZIN project. He is educated as a mechanical engineer and has worked for Elsam for 20 years.

Marius Noer is advisory project manager and has previously been responsible for building projects in Elsam (Bygherre). He is educated as a mechanical engineer and has worked in Elsam for almost 30 years.

12.2.1 Environmental understanding

In the following, it is shown that the project managers focus on the external environmental issues, and especially on the emissions, when defining the concept of environment. Two examples are given below:

"*Environment is about the impacts we have on the surroundings, especially the emissions*" (Noer, 2006)

Robert Hvelplund also includes occupational health and safety in his definition.
"*First of all it is the external environment with emissions but is also the conditions that we work in, the physical conditions*." (Hvelplund, 2006)

As the work in the larger projects in Elsam is coupled to building or improving power plants it is obvious that they focus on emissions in their definitions. As Poul Vilhelmsen puts it:

"*It goes hand in hand energy and environment, optimisation of processes is also an environmental issue; we constantly try to reduce the input and the emissions*." (Vilhelmsen, 2006)

But is environment then a central issue for Elsam? They all answer positively to this question and Marius Noer relates it to Elsam's image and organisational policies:

"*It is of great importance for us that we have a positive image and a credible environmental policy. It is very difficult for us to argue for a project that does not go hand in hand with the environmental policy, or at least is neutral in relation to the areas in the policy*." (Noer, 2006)

In the interviews all three respondents address the fact that Elsam has embarked on a new course when it comes to environment and especially with regard to renewable energy.

"*There is no use fighting against the wind, previously we worked against e.g. local CHP plants but today it is different*." (Hvelplund, 2006)

Marius Noer goes a step further saying that environmental considerations are necessary in order to meet the demands of the society:

"*We are a kind of entrepreneur for the society; previously we fought against windmills and the like. We have moved away from being a state inside the state to a more open approach where we consider what the society wants from us*." (Noer, 2006)

As the project managers often work with optimisation of input and reduction of output from the power plants it is natural that they focus on these issues. It is interesting that they all address the changes that have occurred in organisational policies since the merge of the plants in 2001.

Summary related to theoretical framework

Environmental demands are *valued* as an integrated part of the larger projects in Elsam; environmental optimization is the basis for the projects. They often refer to the environmental policy as their reference. The respondents *reason* that environment is mainly related to emissions; the focus area in most of the larger projects. The *values* have changed over time and today Elsam is positive towards environmental issues, but previously they opposed, for example, renewable energy as it made it harder to have a stable energy supply. Now it is seen as a challenge to meet the needs for sustainable energy supply, rather than seeing it as an opponent.

12.2.2 Momentum in environmental activities related to projects

Why does Elsam work with environmental issues and especially why are so many of the projects in Elsam Engineering actually related to environmental improvements or optimisation? The organisational image was often mentioned by the project managers, and this has to be seen in the light that one of the criteria in the environmental assessment procedure is whether the projects effects the organisational image. As Poul Vilhelmsen puts it:

"*Elsam wants to be a green company and that is reflected in the plants we build. We do operate on the free market and therefore we do not make large investments without an incentive for it*." (Vilhelmsen, 2006)

Discussing what actually influences the organisational image Poul Vilhelmsen agrees that it might not be positive enough just to have an efficient coal-fired power plant (Vilhelmsen, 2006). Poul Vilhelmsen describes why Elsam did not focus on renewable energy previously:

"Previously we did not have the need or the technology for working with renewable energy, we focused on stability in supply. Now there are a number of alternative sources of energy at the market, and we meet more and more technical demands." (Vilhelmsen, 2006)

Hvelplund has another view on this; his main area of responsibility is optimization of existing power plants. He sees environmental demands as the basis for new projects:

"*The argument for starting the projects is often environmental; we improve the processes to make them more efficient*." (Hvelplund, 2006)

Focused on how environmental demands are included in the project design phase:

"*First we plan the projects then there is a project design phase that is completed with a purchasing phase where we set the demands for the tender, with all the demands for the suppliers. I do not think that we set environmental demands when the suppliers are pre-qualified*." (Vilhelmsen, 2006)

Setting the environmental demands are not as specified for the projects as for product purchasing therefore it was discussed who they contact when deciding upon which environmental demands to prioritize. They all agree that EKM is their main source for knowledge and help:

"*We often collaborate with EKM when starting new projects, besides this we ask them when we run into problems*." (Vilhelmsen, 2006)

"*Sometimes I contact EKM and make them go through the project and say what demands we need to set and what they find relevant to document*." (Hvelplund, 2006)

"*In situations where we are in doubt about what is most important we discuss it with EKM."* (Noer, 2006)

On the other hand, there are environmental challenges, where EKM is not the primary source of knowledge.

"*There have been many discussions related to EU-tenders and EKM does not have the competences to handle this, but they fund a lawyer outside the department that helps me*." (Hvelplund, 2006)

The discussions about making EU-tenders have also been addressed in the CEMIP group, and it is rather difficult to understand the rules and regulations in this field. The project managers find it important that they write the tenders, also when it comes to environmental demands:

"*It is the culture that it is the technicians that write the tenders and include the environmental demands, but we do talk to EKM*." (Hvelplund, 2006)

Asked what is of importance for maintaining focus on environmental issues in the daily work, two aspects come up; the audits and the visibility of environmental effort.

"*Each year EKM comes and sees if we apply the environmental assessment procedure, and then we show them some examples*." (Noer, 2006)

Hvelplund does not find that the yearly audit is enough to keep the focus:

"*It is important that we meet small things everyday that reminds us about the environmental effort, or else the discipline is reduced*." (Hvelplund, 2006)

Generally the project managers are positive towards environmental initiatives both related to Elsam in general and in their own projects. They find that environmental issues that results in technical specifications are just as easy to cope with as all the other technical demands they have to comply with in their projects.

Summary related to theoretical framework

Environmental improvements are the basis for many projects in Elsam and the project managers are positive towards this and *value* the technical approach to environmental improvements. On the other hand there has to be an economic incentive for the projects as well. *Values* have changed so that renewable energy is now a part of the solution for a green image.

The environmental assessment procedure is an important *fact* as it guides the practices for making environmental assessments and including EKM in this process. As it is a part of the larger projects to involve specialists from different fields it might be more obvious for the project managers to involve EKM in the environmental considerations than it is for other departments in Elsam.

12.2.3 Green procurement

The project department collaborates with the suppliers about research and development and the technical solutions for problems.

"*We have a close collaboration with the suppliers; it is large and complex deliveries*" (Hvelplund, 2006)

Asked whether environmental issues are involved in this communication he answers:
"*Environment is not a part of the daily communication with the suppliers only indirectly; one of the arguments for the projects that we work with is controlling the flows of materials and reducing the environmental impacts*." (Hvelplund, 2006)

Marius Noer supports this view:

"*We mostly communicate with the suppliers about technical specification that has an origin in environmental demands*." (Noer, 2006)

The project managers are supposed to follow a procedure for environmental and occupational health and safety assessments of their projects (see 12.1.1). The implementation of the procedure and the reason for not using the standard questionnaire is described in the following.

Poul Vilhelmsen explains that there has not been a specific introduction of the procedure:

"*The project managers were not introduced to the new procedure for environmental assessments but they follow the procedures in the management system."* (Vilhelmsen, 2006)

All three respondents explain how they previously used the environmental questionnaire for their suppliers but it was decided to make an environmental assessment instead. Robert Hvelplund finds the questionnaire too simple for their kind of projects:

"*Previously we used the questionnaire, that is about 3 years ago, but we do not use it anymore, it is too simple for the complex purchases that we make.(..)Now we write in our tenders what environmental demands we have*." (Hvelplund, 2006)

Asked whether he prefers the new procedure, with the environmental assessments he answers:

"*We seldom refuse suppliers because of their environmental performance, but we do set demands for the hardware we buy. Maybe the suppliers change their processes, but most of all they comply with the demands for the hardware, and that is important for the environmental impacts of the products*." (Hvelplund, 2006)

He argues that from an environmental point of view it makes more sense to set demands for the products and their environmental performance than to the environmental performance of the supplier.

Poul Vilhelmsen describes that it might lead to suboptimisation asking if the suppliers have environmental management, as they might, for example, deselect the supplier that can deliver a gas turbine with the highest efficiency. Besides this, it causes problems related to tenders where there are a limited number of possible suppliers:

"*The questionnaire was more demanding than we first believed, if we ask for environmental management we have to prioritise it, and what if the supplier with environmental management did not meet our demands for efficiency? Or, if there only is one possible supplier and he does not have environmental management*?" (Vilhelmsen, 2006)

Afterwards, he explains how environmental considerations are then included in the projects:

"*After deciding not to use the questionnaire we make an environment and occupational health and safety assessment of the projects. Then we recommend the project to the management and after this we make the tender. Environmental issues are thereby included all the way*." (Vilhelmsen, 2006)

As Vilhelmsen argues this actually does make more sense from an environmental point of view.

Marius Noer has almost the same way of reasoning why the questionnaire is not appropriate for project tenders:

"*The questionnaire is used as a kind of deselection of suppliers, and then we sometimes ended up not having any suppliers at all. I think that it is more appropriate when buying chemicals or other standard products*." (Noer, 2006)

Thereby he also finds that there are other situations where the questionnaire makes sense. Hvelplund mentions some examples where the suppliers have to change their production in order to meet Elsam's demands:

"*Sometimes they have to change their production because we do not want specific substances, but most of the work lies in the efficiencies we demand for the products*." (Hvelplund, 2006)

Marius Noer gives another example where they did not get the suppliers to change to another substance due to the guarantee that the suppliers have to give:

"*We have a problem with hydraulic oil but if the supplier insists on a specific kind we can not do anything about it as he is the one setting the guarantee*." (Noer, 2006)

They address different kinds of environmental impacts in their demands for the suppliers:

"*We set environmental demands through the performance of the products in operation. We also set demands for the fabrication of the product; we e.g. do not want epoxy and PVC and cables are to be halogen free*." (Vilhelmsen, 2006)

As the others, he indicates that the demands they set for the suppliers are both related to the performance of the products and their contents such as chemicals.

Discussing when to set the different kind of demands Marius Noer says:

"*It is important that we really focus on the issues where we can make a difference and not be too strict in the areas that do not mean anything anyhow."* (Noer, 2006)

They use EKM to help make this prioritisation. Discussing whether their supplier management covers all important aspects of the life cycle of the products Marius Noer answers:

"*We discussed this; should we e.g. set demands for compliance with the ILO conventions? The limits goes with child labour, we cannot accept that*." (Noer, 2006)

The project managers argued that the questionnaire rules are too strict for their kind of purchase, but on the other hand they now would like some clear directions for assessing environmental issues in the projects:

"*I would like more clear guidelines on how to assess the environmental demands that we set for the suppliers*." (Vilhelmsen, 2006)

The project department has found an appropriate way of handling green procurement where they make sure to address the important environmental aspects, by including EKM in the tenders, and at the same time is positive towards green procurement.

Summary related to theoretical framework

The procedure for environmental and occupational health and safety assessments of projects is an important *artefact* that the project managers use. The *practice* of not applying the questionnaire is also important as it shows that they have assessed the outcome of this tool and found that it is not appropriate for them. On the other hand a *practice* with an alternative approach to setting demands for the suppliers' environmental performance could be considered, especially related to the suppliers that are frequently used, influencing the suppliers to work with continuous environmental improvements. The environmental *communication* with the suppliers is included in the technical specifications for the products and thereby environmental issues are not seen as something separate but an integrated element in the tenders. The project managers *reason* that the questionnaire is appropriate when buying standardised products whereas in the larger projects with unique products the environmental demands are to be considered individually in relation to each project.

12.2.4 Summary related to theoretical framework

Table 26 presents a summary of the findings related to the project purchasers.

Theoretical concept	Project managers at Elsam Engineering
Emphasised practices	▪ The environmental assessment procedure is an important fact as it guides the practices for making environmental assessments and including EKM in this process. ▪ A common practice in larger projects is to involve specialists from different fields, thereby it might be easier for the project managers to involve EKM in the environmental considerations than it is for other departments in Elsam. ▪ The practise of not applying the questionnaire is important as it shows that they assessed the outcome of this tool and found that it is not appropriate for them
Important artefacts	▪ Environmental improvements are the basis for many of the projects in Elsam ▪ The project managers have a good insight in environmental issues related to their work.
Reasoning	▪ The respondents reason that environment is mainly related to emissions as this area is in focus in the larger projects. ▪ Previously Elsam opposed e.g. renewable energy as it made it harder to have a stable energy supply. Now Elsam has made it a challenge. ▪ The project managers reason that the questionnaire is appropriate when buying standard products whereas in the larger projects the environmental demands are to be considered individually in relation to each project.
Values	▪ Environmental demands in tenders are valued as part of the larger projects in Elsam; it is often environmental optimization that is the basis for the projects, ▪ The managers refer to the environmental policy and organisational image as their reference. ▪ Values have changed so that renewable energy is now a part of the strategic development in Elsam. ▪ The project managers are positive towards environmental issues and value the technical approach to environmental improvements, on the other hand there has to be an economic incentive for the projects as well.
Communication	▪ The environmental communication with the suppliers is included in the technical specifications for the products and thereby environmental issues are not seen as something separate but an integrated element in the tenders. ▪ Frequent communication with EKM secures a proper environmental focus in the projects.

Table 26 Summary of findings from interview with project managers in Elsam.

12.3 Conclusion

The project department represents a unique subculture related to green procurement in Elsam due to several factors: First of all their values, practices, way of communicating and reasoning are similar; they think product-oriented and set product oriented demands when they purchase. They find that environmental considerations are a part of the basis for working with projects in Elsam. They have a standardised collaboration with EKM and involve them in the projects on an ad hoc basis as well. They refer to how their work influences Elsam's image and environmental goals. These considerations are elaborated below.

Making large tenders with prequalified suppliers often reduces the number of potential suppliers to few or maybe only one. This is one of the reasons why the project managers do not find that it is appropriate to use the questionnaire for assessing the suppliers; they might end up without any supplier at all. They also use an environmental argument as they find it more important to focus on the environmental impacts from the power plants in operation than the environmental procedures of the suppliers. Besides this they also set demands for the use of chemicals in the production of the products and other environmental aspects that EKM finds important. It is easy to follow this argument but on the other hand it is not appropriate to accept that the suppliers do not comply with the standards that Elsam sets for their suppliers in general. Therefore, a dynamic approach could be considered in regards to collaboration with the suppliers so that they make action plans for complying with the standard.

Including EKM in the development of the tenders for projects that are perceived to have significant environmental impacts, is not a practice found in other departments. As it is an integrated part of the larger projects to involve specialists from different fields it might be easier for the project managers to involve EKM in the environmental considerations than it is for other departments in Elsam.

The projects in the project department often have significant environmental impacts. Therefore the impacts are assessed in relation to the environmental targets in Elsam, the potential image impact and the environmental policy. This is included in the environmental assessment procedure and secures that the projects are in line with the general development in Elsams environmental effort. This also gives the project managers an insight into the strategic environmental effort in Elsam and they are positive towards this.

Reflections and recommendations for future implementation strategies:

- Involving EKM helps prioritising the environmental demands in the green procurement.
- A product oriented approach for green procurement secures focus on important environmental aspects and creates positive values among the Project Managers.
- As for the other departments in Elsam a dynamic approach to the demands for the suppliers, developing action plans for their compliance with Elsam's demands could be considered. It is not necessarily the most appropriate approach just to skip the supplier and thereby the demands for improvements of the practices of the suppliers.

References for chapter 12

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13 Synthesis and recommendations

The purpose of this chapter is to analyse the strengths and weaknesses of green procurement in the different departments in Elsam and give recommendations for further development of the green procurement practices.

The chapter is based on the empirical results from the analysis in chapter 8-12. The theory applied in this chapter draws on the theoretical framework developed in chapter 5.

In each section the empirical findings are discussed with the point of departure in the green procurement practices and, based on this, the recommendations for changes are elaborated. The complexity of the recommendations increases during the chapter; starting with practical changes at the operational level and ending up with more far reaching recommendations for cultural change.

In the end of the chapter a conclusion elaborates how the recommendations are linked at three levels:

- The practical changes in procedures and tools (Section 13.1)
- Changing the roles of the environmental coordinators in Elsam (Section 13.2)
- Strategic recommendations (Section 13.3)

The strategic recommendations and the roles of the environmental coordinators are developed to support the practical changes.

13.1 Recommendation for practical changes

In this section the specific recommendations for the current procurement practices are presented. The recommendations are based on the challenges in the implementation of green procurement practices in Elsam that were identified in the case analyses in chapter 8 - 12.

13.1.1 Develop a product-oriented approach to green procurement

In Elsam, a gap exists between the content of the questionnaire and the goals for green procurement. Both documents specify a product-oriented approach to green procurement whereas the questionnaire mostly addresses the degree of compliance with standards for environmental, quality and health and safety management and environmental policies at supplier level.

The case analyses of the different departments in Elsam have shown that the departments interpret the green procurement differently, see figure 30. The purchasers at the power plants mostly stress the policies and management systems of the suppliers whereas other departments such as the purchasing group and central purchasing department to some extent set product oriented demands for selected product groups. The Project Department has a tradition for setting product oriented demands for the plants and machinery they purchase, for example in relation to efficiency and content of chemicals.

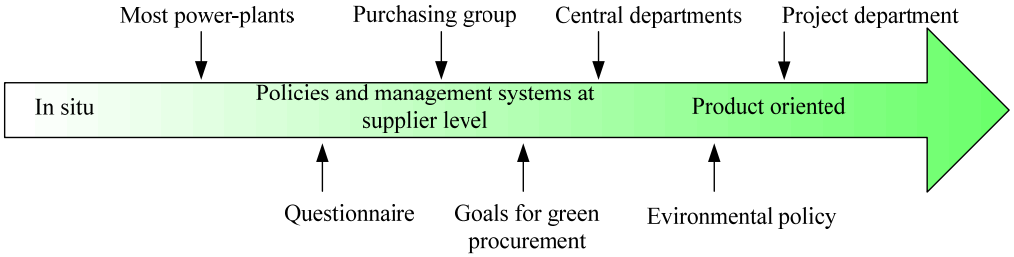

Figure 30 Environmental understanding in green procurement in Elsam. The arrows illustrate the understanding embedded behind the practices of the different departments in Elsam and in formal documents for green procurement.

In order to meet the goals for green procurement a product oriented approach to green procurement is necessary. This can be considered by redesigning and supplementing the questionnaire with other tools and several of the other recommendations in the following.

13.1.2 Redesign the questionnaire

The interviewed employees find it positive that they were involved in the process of developing the questionnaire and explain that this helps to create ownership of the initiative. On the other hand, the questionnaire does not comply with the intended goals for green procurement in Elsam. The case analyses showed that too many conflicting interests were taken into account and there was an intention of ending up with one common questionnaire, which is applied in all parts of the organisation. The diversity of interests for green procurement in different departments is illustrated in figure 31.

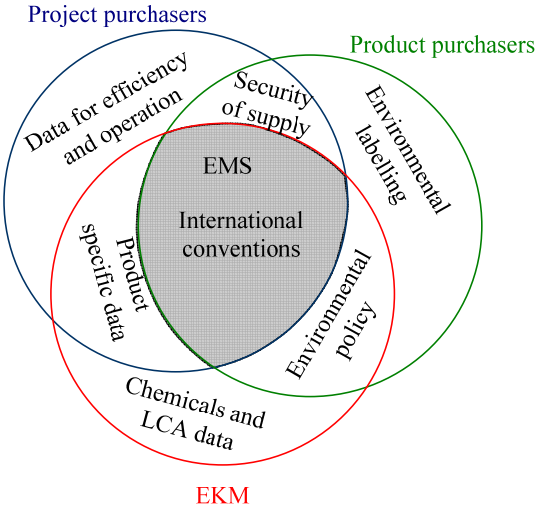

Figure 31 Differences in interests regarding the content of the questionnaire for green procurement. The intersection shows the common interests of the departments and thereby the issues that were included in the questionnaire.

The product purchasers, both in the central and the local purchasing departments, were interested in product oriented demands in the questionnaire, e.g. by asking for eco-labelling. Besides this, they are interested in security of supply. The central environmental department (EKM) wanted to include life cycle data in the questionnaire, as they apply these data in life cycle assessments. They are also interested in asking for the environmental policies of the suppliers as this is included in the goals for green procurement in Elsam. The project purchasers are mostly interested in the efficiency data of e.g. the gas turbines they purchase and in security of supply.

As a common element, illustrated in the centre of figure 31, all departments agreed to ask for compliance with international conventions regarding child labour and standards for management systems on quality, occupational health and safety as well as the environment. The project department afterwards found, that the questionnaire was not useful for them, as other kinds of environmental information from the suppliers were considered to be more important. The content of the questionnaire was found more appropriate in other departments.

The questionnaire illustrates a mismatch between the policies and practices. Since the power plants are certified according to ISO 14001 this demands accordance between policies and practices. The process of developing the questionnaire was difficult and created conflicts between departments because of the differences in interests, and for this reason the questionnaire has become a rather static fact.

As an important part of green procurement procedures in most organisations, a supplier questionnaire has to be relevant to and focus on the specific needs of the different departments, and at the same time keep the environmental policies and goals for green procurement in mind e.g. by letting specific departments approve the locally formulated questions and making a list of mandatory and optional questions as a frame for developing the questionnaire at the local level.

13.1.3 Use green procurement to create product chain dynamics

The demand for green procurement is specified in the environmental management system and the environmental policy. The goals for green procurement and especially the environmental policy specify that the green procurement should "*encourage the suppliers to improve their environmental performance"*. In order to encourage the suppliers to change their practices, a dialogue is necessary and this calls for a higher level of interaction. The present level of communication is based on information exchange where the suppliers do not know Elsam's expectations.

The questionnaire applied at the power plants and the related green procurement procedure does not include any feed-back to the supplier. The power plants send the questionnaire to the suppliers but do not have any follow-up procedure when receiving the answers. The supplier is approved or rejected but is not informed about the reasons for a potential rejection.

When developing purchasing agreements in the central purchasing department the level of interaction is higher as the suppliers are included in the process of selecting or developing environmental demands for each product group. A similar practice is applied in the purchasing group. The project department has a close collaboration with the suppliers due to the complexity of the projects; the suppliers are involved in both the development and implementation of the projects. Thereby the project department has the highest level of interaction with the suppliers, at least related to green procurement. In figure 32 the level of interaction with suppliers is illustrated.

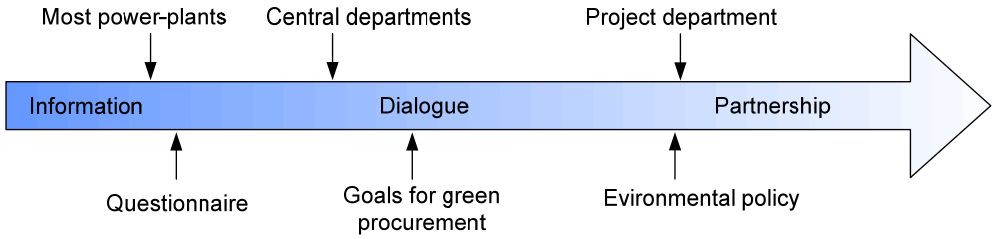

Figure 32 Level of interaction for green procurement. The concepts of information, dialogue and partnership are explained in chapter 1 .

In order to comply with the environmental policy and the goals for green procurement a procedure for green procurement must be established based on higher levels of interactions between the purchasers and the suppliers. This is done in order to secure that the questionnaire actually becomes a tool that encourages the suppliers to improve their environmental performance. To facilitate such interactions, awareness of the present gap must be raised and the conditions must be provided for the employees to fill this gap, for example by offering environmental education for purchasers. An alternative is that even more of the purchasing is handled centrally and the local purchasers only handle small local suppliers. A higher level of communication is time-consuming, and may not be possible for the local purchasers. This speaks in favour of a centralisation of the green procurement, for at least the part of green procurement that involves a high level of interaction between the purchasers and the suppliers.

13.1.4 Increase the level of internal interaction

The purchasing group does not have a tradition for collaboration with central departments besides the procurement department. They seldom collaborate with EKM, and the purchasers in this group ask for tools that can be applied in order to determine what environmental impacts to address in their collaboration with suppliers. The purchasers have limited knowledge of environmental issues, and the environmental department has limited knowledge of purchasing, which calls for collaboration. The local purchasers at the power plant sometimes ask the local environmental coordinators for help, but communication is often limited and they almost never contact EKM. One exception is the purchaser at Skærbækværket as he is situated at the same location as EKM.

The project department collaborates with EKM both in development of environmental impact assessments (EIA) and by including environmental aspects in their tenders. The project department has a tradition for using different kinds of consultants in their projects when necessary. The levels of communication internally in Elsam related to green procurement are illustrated in figure 33.

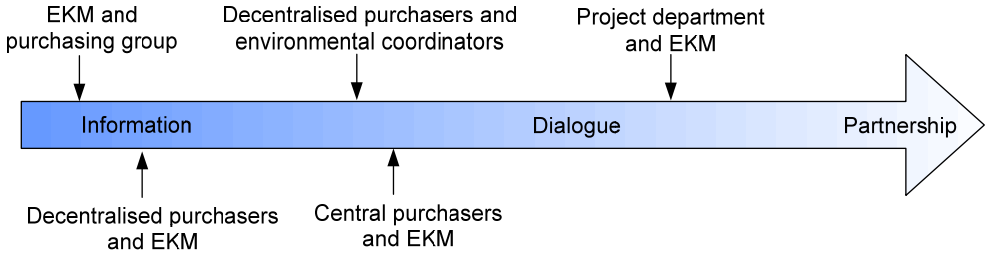

Figure 33, Level of internal communication related to green procurement.

The appropriate level of internal communication between the departments is dependent on the task to be solved. Information exchange will often be enough if the goal is documentation and data collection.

Partnerships might be necessary if the goal is environmental improvements in large projects, as is the case for the project department and EKM.

Both the purchasers and the environmental departments must be involved in the implementation of green procurement to secure that the important environmental aspects are addressed and that the procedures are implemented in the purchasing practices. EKM work as consultants for the other departments and a high level of interaction are both time-consuming and expensive for the purchasing departments. This is a barrier for increasing interaction.

13.1.5 Create ownership of green procurement by participation

The purchasers that have participated in the development of the supplier questionnaire are more positive towards it than those that have not participated. What Dixon (1999) calls collective meaning structures are established during this development process making the implementation of the questionnaire easier.

The meaning structures vary from plant to plant and are dependent on the local environmental coordinator. The environmental coordinators work as brokers for implementing the questionnaires at the plants and therefore they have an important role to play in introducing new initiatives at the plants. These new initiatives and the discussions concerning their implementation result in constructing new meaning structures related to green procurement in the power plants.

Involvement of the purchasers in the process of developing a questionnaire is important both related to the development of a common understanding as well as to having local ambassadors during the implementation of the procurement procedures. A dialogue with the environmental coordinators and discussions about the important practices of applying the questionnaire could also provide motivation for the development of locally revised questionnaires, following a local ownership.

13.1.6 Secure environmental improvements

Several of the purchasers explain that the green procurement has not actually lead to environmental improvements by the suppliers. This established meaning structure has implications for the possibility to develop the questionnaire, or can influence the green procurement practices in other ways, as deconstruction of already existing meaning structures can be difficult. In the project department this might lead to difficulties; the interview showed that the collective meaning structures are negative towards setting demands related to e.g. international conventions, production standards and environmental management systems. This is due to previous negative experiences with the questionnaire.

In the process of reconstructing the meaning structures, the environmental coordinators work as brokers between the central initiatives and the purchasers. A thorough introduction of the questionnaire by the environmental coordinator is part of this role. (See also section 13.2 describing roles in the environmental effort).

The purchasers feel ownership for the present questionnaire but it does not encourage the suppliers to make environmental improvements. It is important that the procedure for follow-up on the answers from the suppliers suits the needs of the single department, securing that green procurement leads to actual results.

The actual purpose of the questionnaire is not clear and defined in the procurement policy, the result of this is that several interpretations will exist at the same time in the organisation. This aspect is addressed further in the following section.

13.1.7 Supplement the questionnaire

Most departments have accepted that the questionnaire has been selected as the tool for green procurement. However, the central purchasing department and the purchasing group supplement the questionnaire with product oriented demands in tenders. The project department has chosen an alternative method in which they develop the demands to suit the single projects, as they found the questionnaire to be an obstacle for their purchasing activities and their possibilities for choosing suppliers. This is done in collaboration with EKM and is based on a list of Elsam's significant environmental impacts.

The purpose of the tools should be considered; is it the intention that the questionnaire should encourage the suppliers to improve their environmental performance? This could be done by making demands for continuous improvements. The questionnaire could be coupled with other procedures like prioritising the suppliers based on their environmental performance, conducting environmental audits with selected suppliers or creating partnerships in order to strengthen the environmental effort of the supplier. A discussion of different ways of handling supplier communication can be found in appendix II.

In short, most departments use the questionnaire but those departments that have reflected upon the actual outcome of applying the questionnaire have reformulated it, added questions or implemented another tool.

Through supplier self evaluation, Elsam shows responsibility for the environmental impacts from suppliers and this might strengthens their image. Sending questionnaires to all suppliers may not be an appropriate way to prioritise the resources. (See discussion in chapter 2).

Therefore, the needs and practices in each department must be reconsidered and the appropriate tools to meet the specific targets for green procurement have to be implemented. A tool that fits the needs of a local purchaser might not be appropriate for e.g. a centralised purchaser. An example is that the central purchasing department needs environmental assessment tools to evaluate the products from large suppliers of chemicals or electronics whereas suppliers of e.g. office supplies can be handled through a standard questionnaire.

13.1.8 Maintain and develop the purchasing agreements

The way the purchasers have accepted the centrally developed purchasing agreements differs, as illustrated in the case analysis. Some find that this makes their job easier as they do not have to worry about getting the right price or making environmental approvals. Other purchasers find that the purchasing agreements are too strict, and do not leave room for the local suppliers that the power plants use.

The central purchasing agreements are one of the areas, where green procurement is managed centrally. The development of the agreements leads to positive meaning structures among the purchasers. They are developed by the purchasing group in collaboration with the central purchasing department. Most of the purchasers like using the agreements, even though there is still some resistance.

It can be questioned whether a questionnaire is an appropriate tool for supplier evaluation related to large tenders. Besides this, special expertise is needed in the process of tendering in order to secure that the appropriate environmental issues are addressed in each tender.

Given the limited environmental competence of the purchasers, environmental specialists should play an active role in the development of central purchasing agreements by developing a procedure for environmental assessments in tendering. Thereby it is secured that environmental experience is involved in setting environmental demands in the tendering process, if the products have significant environmental impacts or influences the environmental targets in Elsam.

In order for the recommendations in sections 13.1.1 -13.1.8 to be implemented, a development of the roles in the environmental effort in Elsam is needed. This is discussed in the following section.

13.2 Expand the roles of the environmental coordinators

This section begins with an explanation of the existing roles in the environmental organisation in Elsam, based on the empirical analyses in chapter 8-12. Afterwards changes in these roles are suggested, focussing on developing the roles of the environmental coordinators at the power plants and in EKM.

The environmental roles in organisations can also be theoretically substantiated, based on different organisational understandings, and this has inspired the development of the roles. See appendix III for elaboration.

13.2.1 Present roles in the environmental organisation

The focus on the organisation's environmental effort has historically changed over time with two main shifts, as described in chapter 1. The first shift is from a technical approach focusing on technical environmental improvements to a social approach with employees participating in the environmental effort. The next shift is from an internal focus on the factory to a product oriented approach. This last shift has its origin in technical aspects, namely environmental assessments, and develops into a social approach also including collaboration in the product chain and in the network of the organisation. This is illustrated in figure 34.

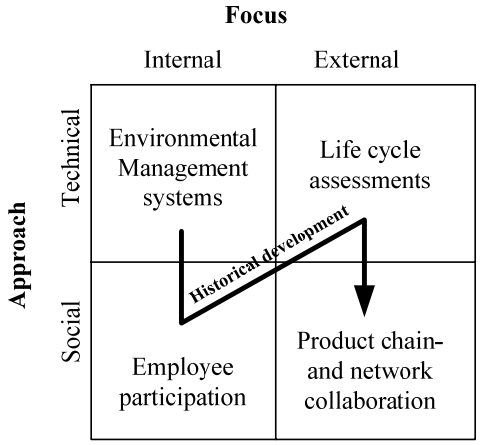

Figure 34 Development in the environmental practices in organisations. (Inspired by Remmen, 2002)

Elsam began implementing environmental management in 2001 and involved the employees in the process. Today they work with environmental assessments and green procurement is a part of their product chain collaboration. Thereby the elements included in the environmental effort have expanded and the roles of the employees engaged in the environmental effort have changed as well. Changing from an internal to an external (technical) approach demands life cycle assessment experts, whereas the external social approach calls for networkers.

The environmental coordinators at the power plant play an important role in raising the awareness of environmental issues among employees. The environmental coordinators facilitate the translation of practices and perspectives from the central environmental department (EKM) into the local departments. These translation processes involve what Wenger calls "boundary encounters" (in this case encounters between departments), where e.g. procedures developed in one department change the practices in another. In order for the boundary encounter to lead to changes, the brokers must facilitate the process of interaction between the departments. (Wenger, 1998)

Inspired by the changes outlined in figure 34 four different roles of the environmental coordinators are developed and illustrated in figure 35.

Focus / View	Plant	Product chain
Technical	The technician	The LCA expert
Social	The facilitator	The networker

Figure 35 Environmental roles in an organisation.

The development in the environmental initiatives in Elsam does not necessarily determine what kind of roles the environmental coordinators have, as this is related to the environmental coordinators' own interpretation of their roles.

The shifts from a focus on the plants to a focus on the product chains, and the shift between a technical and a social approach are important: a change in the environmental effort creates a need for new roles to be managed. Following this, the need for brokering comes into play to facilitate the implementation of new initiatives and utilise the competences of other departments in improving the environmental effort.

Below a short description of the four roles in environmental management is given:

- **The technician (Environmental or health and safety):** The environmental employee focuses on optimisation of internal processes; analysing and assessing the target areas with an in-situ approach. This can both be related to simple changes of procedures, production planning, etc and to implementation of cleaner technologies.
- **The facilitator:** The environmental employee is the backbone for the implementation of the environmental management locally, managing e.g. employee participation and education of employees.
- **The LCA expert**: The environmental coordinator focuses on improvements from a product oriented perspective; the indirect environmental impacts.
- **The networker:** The network creator collaborates with environmental experts both in the organisation and in the network and works as a broker for introducing new initiatives in the organisation.

Several respondents explain that the environmental communication strategies in Elsam have shifted. Previously Elsam did not address the environmental stakeholders if they could avoid this. Recently they have developed a more communicative practice discussing e.g. integration of renewable energy with different stakeholders; mainly on the strategic level. The case study shows that the level of environmental knowledge and education, among other things, influence the roles of the local environmental coordinators at the power plants. The technical approach calls for a profound environmental knowledge of the coordinators, whereas the social approach calls for collaborative skills too.

Some environmental coordinators manage more than one of the roles, but most of them are focused on a single role. The different roles are exemplified by presenting different competences of environmental coordinators below.

The technician

Both the central and the local environmental coordinators in Elsam play a role as technicians as they are responsible for development of environmental target areas and local updates in the environmental management system. The local coordinators are also responsible for assisting the local purchasers in the green procurement practices. The local coordinators do not focus on their technical roles. The limited environmental education amongst the environmental coordinators might be one explanation for this. None the less they do have some technical tasks such as collecting data for green accounts, implementing new technologies and measuring emissions. The green accounts are formulated in EKM, and new initiatives related to the environmental management system are also initiated by EKM. EKM is responsible for the development and implementation of environmental strategies in Elsam. EKM has most of the technical environmental competences in the organisation, and works as consultants for the power plants.

The environmental target areas at the power plants do not address the significant environmental impacts from the plants, as discussed previously, and this might be a symptom of the lack of environmental technicians at the power plants. The project department has a tradition for including environmental technicians in the development, assessment and construction of larger projects.

The facilitator

The purchasers mention the environmental coordinators both as the driving force for environmental effort and the ones they turn to if in doubt of environmental issues. They also implement new environmental initiatives. The environmental coordinator translates the demands and changes in the environmental management system and presents it for the employees at the power plant. The environmental coordinator focuses on the processes of employee participation and securing positive attitudes towards environmental initiatives. This role is dominant for several of the environmental coordinators in Elsam.

At some power plants the environmental employee and the purchasers use the same stories in order to explain environmental issues. One example is explaining a type of suppliers which does not have significant environmental impacts, such as when three interviewed persons from the same power plant mentioned the local bicycle shop. They have created what Dixon (1999) calls a collective interpretation of the procedure saying that they should only assess suppliers which have significant environmental impacts. The stories seem to originate from the environmental employee and are adopted by the purchasers. This shows the significance of the environmental coordinator in framing the local environmental understanding.

The focus on occupational health and safety versus external environment is one of the main differences between the environmental practices at the power plants. The practices of the environmental coordinator significantly influence the other employees, distinguishing between whether he is primarily an environmental coordinator or an occupational health and safety coordinator. Some coordinators value both issues others only occupational health and safety. Significant differences in the subcultures at the plants related to this issue.

The LCA expert

In Elsam a few LCA experts are situated centrally but none are employed at the plants. They work as consultants for the project department and other central departments but interact seldom with the power plants. LCA experts are used to secure that the important environmental issues are addressed, for example, in the development of tenders for larger projects and supplier agreements.

The networker

Most environmental coordinators participate in networks as a part of their job, with emphasis on the internal network in Elsam related to the AMSG (network of environmental coordinators) and EKM. The external networks are mainly addressed on a strategic level in Elsam; the examples identified in the case study are related to influencing the regulation in the "Waste and Energy" department and contact with authorities by EKM.

EKM has previously had a role as network creators inside the organisation but this changed with the organisational structure and they are now consultants for the other departments. The network creator role is limited and they do not have a momentum for maintaining new initiatives for the power plants; they more or less work as technical experts.

The purchasers only participate to a limited extent in networks, besides their contact to the suppliers. The environmental networks are primarily internal with members from the purchasing group that has participants from the different power plants in Elsam. The network is indirectly important for the purchasers as they know that other companies make environmental assessments of the suppliers as well. Therefore, it is easy to accept that they have to do the same.

13.2.2 Result; most competences are present, communication is needed

Elsam uses artefacts to support and manage the green procurement, especially tools and procedures. The local environmental coordinators work as brokers between the central departments and the power plants in the implementation of the tools and procedures.

The green procurement practices can be explained by the distribution of roles in the organisation, where the technical skills are situated centrally and the coordinators mostly work as facilitators at the power plants, illustrated in figure 36.

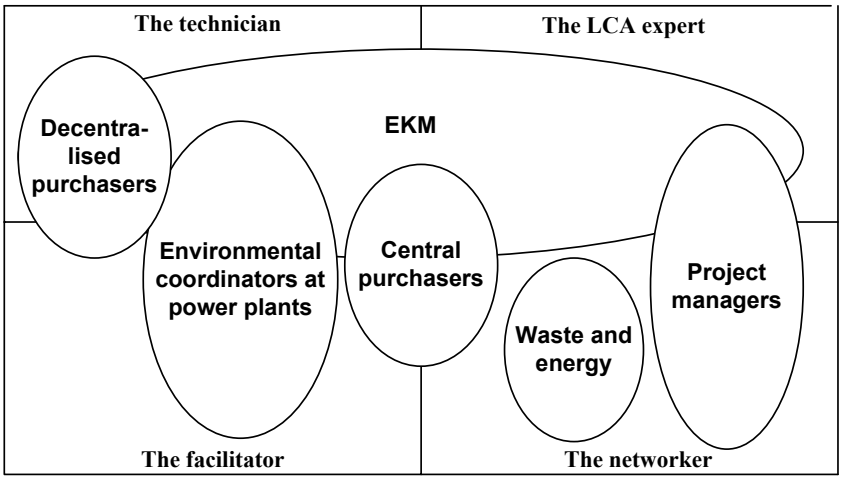

Figure 36 Distribution of roles in the green procurement in Elsam.

This limited technical competence at the power plants combined with a limited degree of interaction between the departments makes it difficult to develop and implement green procurement that both secures focus on appropriate environmental demands and makes the green procurement accepted on a local level.

Technical skills are not available at the power plants in order to develop tools for green procurement, and the centrally developed tools are not modified to fit the needs of the departments that use them. The technical skills are available in the organisation but are not exploited. Further interaction between departments and changes in established roles in the environmental effort are therefore needed.

In the following suggestions are given to change this dilemma by focusing on interaction and collaboration between the existing employees in Elsam. The focus is on developing and expanding the networker role to include brokering in order to utilise the distributed competencies in the organisation and to develop the roles of EKM to serve as environmental facilitators for the local departments.

13.2.3 Recommendations –developing the roles of EKM and the local environmental coordinators

A development of roles in the environmental organisation in Elsam should secure that the technical competencies already present in the organisation are applied to develop the green procurement practices. This can be accomplished by facilitating a higher level of interaction between the departments in order to raise the awareness of the employees in their environmental effort and utilise each other's competencies.

Besides this, the interaction facilitates the development of positive attitudes towards the local environmental effort. The primary recommendation is for EKM to develop their roles and manage different roles in the environmental effort, whereas the recommendation for the environmental coordinators at the plants is mainly to work as local facilitators.

Develop the roles in EKM; from consultants to environmental facilitators and network creators

The project department has found a way to exploit the technical environmental competencies of EKM by using them as consultants in the development of tenders. Thereby they combine the competences so that EKM facilitates the development of tools, and the local environmental coordinators, together with the purchasers, work with implementation of the tools afterwards.

The purchasers and local environmental coordinators do not have the same tradition as the project department for including consultants in their work. Therefore EKM must also be more communicative; being proactive in establishing collaboration with the power plants. Change in the organisational set-up is then necessary so the power plants do not have to pay for the support from EKM.

Personal relations have shown to be of importance for facilitating the interaction between the departments in Elsam. Several employees have a long history in Elsam which eases the communication. Thereby, the local purchasers and environmental coordinators that know employees in EKM interact more frequently with them regarding green procurement.

It is an important task to maintain and develop an external network to secure knowledge supply and compliance with regulation. In general, green procurement should also be aligned with expectations from relevant stakeholders. This perspective is relevant but not elaborated further in this thesis.

Environmental coordinator as a broker between EKM and employees at power plants

Some of the environmental coordinators have focused on the environmental demands and the coherence with the practices of the employees; translating the demands from EKM to practices at the power plants.

A main difference identified in the environmental effort at the power plants is the level of employee participation. The power plants where employee participation has been central both in the implementation of environmental management and green procurement tend to have positive values towards environmental initiatives as they understand the importance of the initiatives for the organisation. In this case the environmental coordinator has worked as a broker between demands from EKM and the purchasers.

An example is Nordjyllandsværket, where they have focused on involvement of employees in the implementation of the environmental management system, and the environmental effort is incorporated in daily practices. The green procurement has become a "natural" part of the environmental management system, and is not seen as something special or unique compared to other environmental initiatives.

It is important to keep focus on both occupational health and safety and external environment at the power plants in the continuous improvements. How to do that is decided by the circumstances at each plant. Having separate coordinators for each area is successful at Nordjyllandsværket, however this demands a close collaboration between the coordinators e.g. to secure coherence in the initiatives.

The environmental coordinator as broker between EKM and local management

There is a need to develop the role of the environmental coordinator to secure that the managers at the power plant level understand the importance of green procurement and the environmental effort in general, as some purchasers feel that the local management counteracts the green procurement practices. Thereby, the environmental coordinators need to understand the different practices and ensure that they do not counteract each other, and secure that the incentives of the local management support the environmental initiatives from EKM.

Develop the role of the purchasers; increasing their decision making competence

At some power plants the decision-making competencies are placed with the purchasers, and they can accept or reject suppliers based on their score in the environmental assessment. At other plants, the purchasers make the assessments but the managers decide whether to reject the supplier or not. There are examples of power plant managers who accept suppliers that do not comply with Elsam's environmental demands because of economic considerations. In this process the decision-making competencies are not placed with the purchasers, and the management counteracts the green procurement policy. Thereby the purchasers find it difficult to see the purpose of the green procurement policy as it does not lead to any real changes in the supplier evaluation.

In the interviews the purchasers ask for clearer directions of how to act in case of rejection of suppliers. Thereby there is a need for the environmental coordinators to work as brokers between EKM and the local management in order to facilitate green procurement and make sure that procurement practices are supported, and the purchasers have the decisive power to reject a supplier due to non compliance with environmental demands.

13.3 Strategic recommendations

Changing the roles and implementing a product oriented view on green procurement are two steps towards the intended results which must be considered at the strategic level, leading to the following overall recommendations.

13.3.1 Align policies, tools and practices

The proposed changes in roles of the environmental coordinators in Elsam have to be supported by aligned policies, tools and practices.

The practices for green procurement do not meet the organisational goals (see section 13.1.7), and EKM has the technical environmental competences to change this. Therefore they should determine what tools to implement for green procurement in each department, in cooperation with the departments. This has previously been done in collaboration with the project department where an environmental assessment procedure was developed to replace the supplier questionnaire that was not found to be appropriate for this department.

The previous focus on making one green procurement tool for the entire organisation is not to be repeated in this process. Focus has to be on the goals for green procurement and how to meet them within the different departments. For that purpose, EKM should provide a list of minimum demands and a list of potential demands to be considered at department level. In the local use of the green procurement tools the relevant employees have to be involved, making sure that their wishes are considered, and securing that they understand how and why to implement the tools. This is also an important part of the process of creating ownership in the green procurement practices as described in 13.1.5.

It is therefore important that purchasers actively participate to develop, implement and follow-up on the green procurement tools. Collaboration between different purchasers in the organisation can inspire this process. In this implementation process the environmental experts and environmental facilitators can be used as sparring partners when the purchasers need help.

13.3.2 Reconsider EKM in the organisational structure

The present organisational structure places EKM as external consultants related to Elsam Kraft. This creates limitations in the process of implementing green procurement. It is a strategic decision to have EKM as a separate consultancy firm (Elsam Engineering), and it might be a feasible solution related to the larger projects in Elsam, but not related to the environmental effort at the power plants.

This organisational set-up creates a distance between the local and central environmental departments. EKM primarily sees their role as providing a service to the power plants. This prohibits EKM from gaining experiences related to the practical implications and, on that foundation, from being active partners in green procurement.

The organisational gap between the departments is also prohibiting interaction. The local environmental departments do not interact sufficiently with EKM to establish ownership for the environmental effort in Elsam.

Changing the structure by securing a central environmental department to support the environmental effort at the power plants is important. Thereby it would be easier for EKM to work as environmental facilitators for the power plants, making their competencies more easily accessible for the local employees and making EKM more visible in the organisation. Another solution is to distribute the competencies of EKM throughout the organisation. By situating the employees at different power plants a network of environmental coordinators would be created. However this might prohibit the synergetic effects which come from having specialised personnel situated centrally. A combination of the two approaches is also a possibility, having a smaller central environmental department but also having some of the technicians situated at the power plants. All three approaches call for a higher level of internal interaction.

13.3.3 Cultural change; communication as the organisational glue

The environmental policy is an official artefact that reflects the view that the dominant actors want to give of an organisation (Benson, 1977). Most respondents in the interviews knew the policy except for a few local purchasers, and most of the employees found it a useful guide for the environmental effort in Elsam both centrally and at the power plants. The interpretations of the content of the policy are more diversified; some employees, both environmental coordinators and purchasers find that most subjects are dealt with at a strategic level e.g. reduction of CO_2 emissions. However, the employees at the power plants do not find that they have to consider the policy when selecting environmental goals. A few of the respondents find that it covers both the strategic and local aspects and this is mostly employees situated centrally in Elsam. Most respondents refer to the policy when talking about values in the environmental effort in Elsam and thereby it has become an important artefact for their perception of environmental issues.

The environmental policy (as well as the procurement policy, guidelines, etc) can be seen as a boundary object. It is formulated openly and can be applied in practice when the departments or individuals interpret the content. It has different meanings in different departments. Star and Griesemer (1989) specify that creation and management of boundary objects is important both for developing and maintaining coherence across social boundaries. In this case it is across the organisational borders between subcultures in Elsam. The policy is thereby important for the attitude towards environmental issues. In Elsam the environmental policy does not necessarily lead to changes in practices, and thereby it does not become a boundary object but merely an artefact.

The employees are familiar with the environmental handbook that is placed on the intranet and everyone refers to the procedures when asked where they get information for their environmental practices. As the employees have accepted that the intranet is the primary communication channel for new environmental initiatives and information in the organisation, they describe it as an important tool in the daily environmental practices in the organisation, however, they leave the interpretation of procedures entirely to the employees.

Both environmental coordinators and purchasers explain that the practice of conducting the supplier assessments removes the uncertainties related to it, and makes the attitude towards green procurement more positive. Asking the employees about important artefacts in their daily work most of them refer to the intranet and waste bins.

The roles of the environmental coordinators in Elsam, analysed in section 13.2 are also important in order to understand the need for increased communication between the departments in Elsam. The present practices focusing on development of artefacts indirectly assume that they are implemented locally. This is not sufficient to create coherence between intended goals and actual green procurement practices. Both the roles as brokers for the local environmental coordinators and EKM's role as environmental facilitators are based on communication as the glue binding the environmental organisation together rather than the artefacts.

It is important to move beyond the focus of creating shared artefacts and instead concentrate on implementation of the tools through a higher level of internal communication and alignment with actual practices. The policy, the management system and locally developed artefacts play a huge role in the employees understanding of environmental values in Elsam. It is important to keep focus on the local practices in green procurement, so that the values of the employees are aligned with the local practices. Having communication as the glue that holds the environmental organisation together also eases the implementation of new practices; the employees become more aware of environmental issues and their roles in the environmental effort.

13.4 Conclusions – linking the recommendations

This chapter has its origin the challenges for green procurement in Elsam as identified in the case analyses in chapter 8-12. The challenges are divided into developing practices and artefacts, and implementing green procurement practices.

Challenges in developing facts and artefacts:

- The questionnaire is not an appropriate tool for all departments.
- The content of the questionnaire does not comply with organisational goals.
- Lack of product oriented demands.
- Limited dialogue with suppliers.
- Lack of follow-up.

Challenges in implementing green procurement practices:

- Focus on artefacts and limited focus on practices.
- Limited environmental education of environmental coordinators.
- Limited internal interaction between departments.
- Limited support from management; sometimes the management overrules the decisions made by the purchasers.
- Lack of results; if the purchasers do not find that their changes in practices lead to changes in the selection of suppliers or the practices of the suppliers.
- The purchasers do not see a link between the environmental effort at the power plants and the green procurement practices.

These challenges create a basis for the recommendations for practical changes in this section supplemented by appliance of theory and by inspiration of the positive experiences from different departments. The recommendations outlined in this chapter are presented in figure 37.

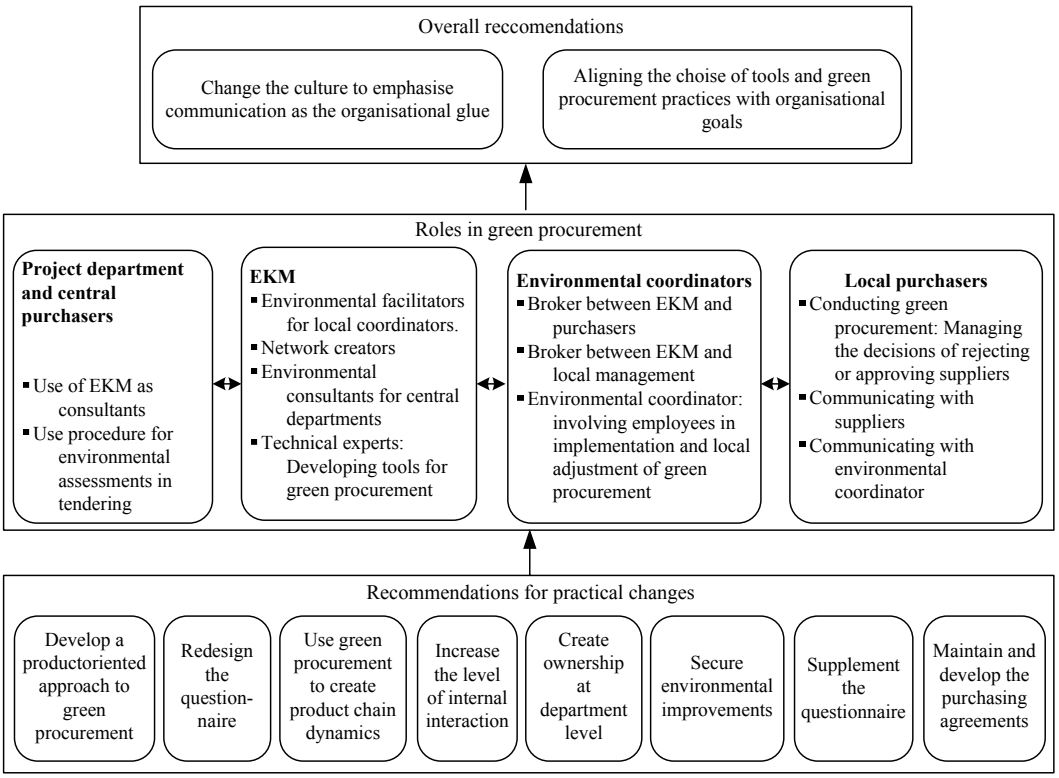

Figure 37 Overview of recommendations for facilitating the implementation of green procurement in Elsam.

In the bottom of figure 37 the specific recommendations for the current procurement practices are presented and these recommendations form a foundation for suggesting changes in the environmental roles connected to green procurement: presented in the middle of the figure. In the top of the figure the two overall recommendations dependent on changing roles and practices are illustrated. The first overall recommendation is changing the culture in green procurement with less focus on tools and more focus on interaction and communication. The second overall recommendation is an alignment of the policies and goals for green procurement with the actual practices in the organisation.

The analysis of the challenges in Elsam's green procurement has its point of departure in the existing practices and artefacts of green procurement in Elsam. The analysis reveals a need for creating flexibility in the artefacts that they apply in their practices, namely the procedures and the questionnaire. The present practice focuses on consensus in the creation of the questionnaire for suppliers, and insists that the same questionnaire is to be applied at all levels and in all departments of the organisation. This has created some challenges for the green procurement practices, leading to recommendations for practical changes:

- *Develop a product-oriented approach to green procurement* by revising the demands for the suppliers in order to meet Elsam's product oriented goals for green procurement.
- *Redesign the questionnaire* to create minimum demands and a list of potential demands which can frame questionnaires specifically developed to suit the needs at department level.
- *Use green procurement to create product chain dynamics* by introducing a dynamic approach with dialogue with suppliers related to their practices and Elsam's demands for them.
- *Increase the level of internal interaction* in order to make use of the environmental competence in the organisation.
- *Create ownership of green procurement* by involving the purchasers in the implementation and local adjustment of the green procurement procedures.
- *Supplement green procurement with other tools* where this is appropriate, for example in the central purchasing department.
- *Maintain and develop the centrally developed purchasing agreements* as these cover the main environmental impact from product purchasing in Elsam.

In order for these recommendations to be implemented, the environmental roles in Elsam should be reconsidered; there are not enough technical skills locally to develop tools for green procurement, and the centrally developed tools are not modified to fit the needs of the departments that use them. There are technical skills present in the organisations but they are mainly situsted in EKM, following a need for utilising these skills by interaction between departments, and changes in established roles in the environmental effort. This leads to the following recommendations for changing the roles:

- *Develop the roles in EKM; from consultants to environmental facilitators and network creators* in order to make use of their technical competence all over the organisation.
- *Develop the role of the local environmental coordinator; broker between EKM and local employees* in order to facilitate the local implementation of green procurement.
- *Develop the role of the environmental coordinator; broker between EKM and local management* to secure that the local management supports the green procurement initiatives.
- *Develop the role of the purchasers; increasing their decision making competence* so that they actually decide what suppliers to accept and reject based on the environmental supplier assessment.

Thereby it is mainly EKM getting new roles related to green procurement whereas the environmental coordinators have to focus on their facilitating role, acting as brokers between central and local departments.

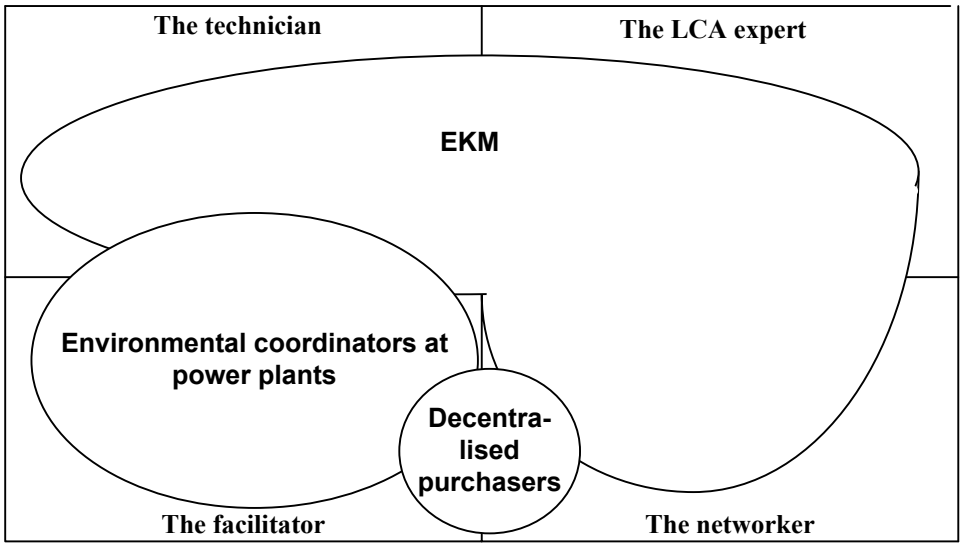

Figure 38 Distribution of roles according to the recommendations.

Gaining access to the technical competence locally is not sufficient as an important barrier for development of the green procurement practices is limited support from the local management at the power plants. Therefore the implementation of green procurement should not only address green procurement practices at the operational level but also secure support from the tactical and strategic level. One way of doing this is by giving the decisive power to the purchasers to approve or reject suppliers based on environmental assessments.

These perspectives broaden the tasks of the local environmental coordinators as to include brokering, co-ordination and alignment between the perspectives of EKM, the purchasers and the local management. They have to have enough legitimacy to influence the development of green procurement practice and address conflicting interests.

Changing the roles and changing the environmental approach to green procurement are two steps towards the intended results, which must be considered at the strategic level, leading to the following overall recommendations:

1. *Change the culture to emphasise communication as the organisational glue.* The purpose of this recommendation is to shift focus from artefacts such as tools, procedures and policies to communication. This means, among other things, that EKM should have a more communicative role and that their position in the organisational structure should be reconsidered.

2. Align the tools and green procurement practices with company goals. To align the tools with company goals, it is necessary to distribute the technical competencies in the organisation. This can be done either by placing more technical competences locally or securing that there is easier access to these competencies.

References for chapter 13

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14 Conclusion and perspectives

The traditional focus on development of tools for green procurement is replaced by a focus on organisational processes, including how the subcultures in the organisation influence the implementation of the green procurement tools. The argument for making this choice is based on the experiences gained from working in the CEMIP group; it is difficult to develop the appropriate communication tools, but getting the purchasers to implement the tools is even more challenging.

In this chapter the main results of the thesis are presented and related to the research question:

How is implementation of green procurement influenced and facilitated by organisational subcultures?

The research question is answered by addressing following sub issues:

1. How can organisational subcultures in green procurement be understood?
2. What are the similarities and differences in subcultures and in green procurement practices in Elsam?
3. How do organisational subcultures influence green procurement in Elsam?
4. How can environmental practices facilitate the implementation of green procurement in Elsam?

Each of the sub issues are addressed separately and afterwards the overall research question is answered. This is followed by reflections upon the methods and theories applied in the analysis. In the end of the chapter perspectives are made, considering how to apply the results from this thesis in green procurement practices in other companies.

14.1 Understanding organisational subcultures in green procurement

The theoretical framework is developed to analyse subcultures of green procurement in an organisation. Three levels are in play in the analysis: The lifeworlds of the respondents, the subcultures at department level, and the interaction between the subcultures.

A social constructivist approach is applied in the development of a theoretical framework for analysing how the purchasers and environmental coordinators perceive green procurement. The concept of culture is applied to address the social constructs whereas the concept lifeworld is applied to address the individual constructs.

The theoretical framework for analysing individual understandings of green procurement takes its point of departure in organisational research 'conceptualising reality' presented in Henriksen et al (2004). In this perspective reality is seen as an integration of the four key dimensions: facts, logic, values and communication. (Henriksen et al., 2004).

The theoretical framework is developed in order to address how organisational subcultures influence and facilitate implementation of green procurement.

In the case analysis lifeworlds are thereby seen as an integration of the four dimensions:

- *Practices and artefacts* that show the observable reality.
- *Reasoning* that provides explanations of how practices and artefacts develop and occur.
- *Values* that explain why actors behave in a certain way.
- *Communication* that shows how the individuals interact and the rhetoric used concerning green procurement.

Subcultures and shared meaning structures are applied to address the shared elements of the lifeworlds.

The lifeworlds of the actors are communicated and either corroborated within a given subculture or questioned in the interaction with other subcultures. Through corroboration collective meaning structures are established in the subcultures and this is what constitutes them as subcultures.

Several subcultures can exist within a company. If their meaning structures differ significantly translation processes and collective interpretation is needed for the subcultures to be able to collaborate.

As the analyses progressed and the characteristics of the different subcultures were identified, it became clear that the interaction and translation between the subcultures is important for the implementation of green procurement. The theoretical framework is not suited for analysing the interaction and translation processes between the subcultures without having two sets of comparable data collected over time. Translation processes, focussing on boundary objects and brokers, are therefore introduced as a means to analyse the interaction between the departments in Elsam.

The boundary object enables the establishment of a common reference point in the interaction between individuals from subcultures. Some individuals in one subculture take on the role of brokers and make connections to other subcultures; thereby they translate knowledge from one subculture to another.

This gives a possibility for providing a picture of both the subcultures in the departments and the interaction between the subcultures. In this way a framework is created for identifying both the stable elements and the process oriented elements of the reality connected to green procurement, the latter by use of reflections on the implementation process.

The theoretical framework developed for analysing the case is illustrated in figure 39.

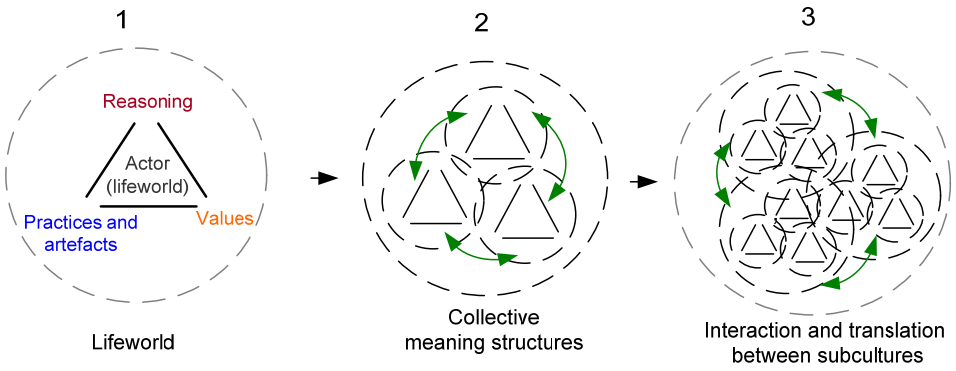

Figure 39 The use of individual lifeworlds, subcultures at department level and the interaction between subcultures. The green arrows indicate communication processes 1: Analysing lifeworld. 2: Using similarities in lifeworlds to describe collective meaning structures within departments (subcultures). 3: Exploring boundary interaction between subcultures. The black arrows indicate the steps in the theoretical development.

14.2 Similarities and differences in subcultures and green procurement practices in Elsam

A green procurement procedure and an enclosed questionnaire was intended to be applied in all departments in Elsam but has mainly been applied at the power plants. The Project Department, the Waste and Energy department and to some extent the Central Purchasing Department have developed alternatives to the procedure. The Central Purchasing Departments and the Waste and Energy department consider what environmental demands to address for each of the larger tenders. In the project department an environmental assessment procedure has been developed as an alternative to the common green procurement procedure. Thereby the tools and practices in the green procurement are adjusted to suit the kind of purchase that these department have.

The environmental understanding embedded in the green procurement practices in the departments is illustrated in figure 40.

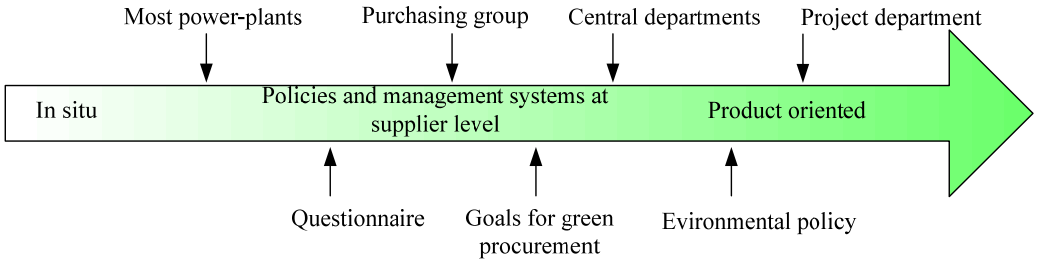

Figure 40 The arrow illustrates the environmental understanding embedded behind the practices of the different departments in Elsam and in formal documents for green procurement.

The goal of one common tool for green procurement in Elsam, namely a questionnaire for suppliers, has failed as some departments do not find this tool appropriate for their kind of purchase and for this reason alternatives have been developed. The development of alternatives to the questionnaire has introduced a more product oriented approach in some departments.

Most of the respondents are positive towards environmental initiatives in Elsam, and most of the local purchasers and environmental coordinators value the green procurement procedure. None the less some of the environmental coordinators find it hard to understand why green procurement is prioritised, as they find that other environmental initiatives have greater potential for environmental improvements.

At some power plants the management counteracts the purchasers when they reject suppliers based on the environmental assessments; this has a negative influence on the purchasers' motivation for implementing green procurement practices.

The employees reason differently about green procurement, especially when it comes to the purpose and practices in green procurement for example how to prioritize environmental initiatives. The importance of a green image and efforts to influence the practices of the supplier are some common arguments being used to explain the purpose of green procurement in Elsam. Another common argument is that Elsam is a polluting company and therefore have an obligation to reduce the environmental impacts. Most respondents find that the environmental assessments of the product suppliers do not lead to any real changes in the environmental practices of the suppliers and therefore those respondents do not consider green procurement to be important.

The communicative practices in the departments also differ. Two forums are of distinct relevance for the communication about green procurement in Elsam; the environmental coordinator group (AMSG) and the purchasing group. In these groups the local coordinators and the purchasers communicate with their colleagues.

The communication between central and local departments is less frequent and it is based on information and dialogue more than actual collaboration; this is illustrated in figure 41.

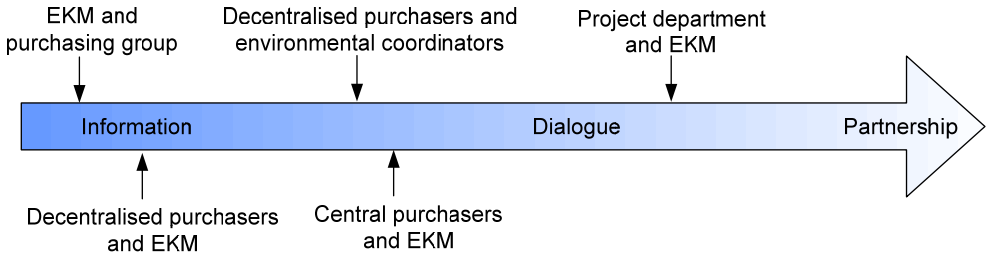

Figure 41 Level of internal communication related to green procurement.

What are the main similarities and differences between the departments then? Some of the important similarities of the power plants are: They value environmental initiatives, they have applied the procedure for green procurement and the purchasers have the responsibility for green procurement. The central departments on the other hand have implemented alternative tools for green procurement.

One important difference of the departments is the level of interaction in the green procurement practices; the power plants base the interaction on information exchange whereas the central departments collaborate with their suppliers. Another difference is the support the purchasers receive for implementing green procurement; some are supported by both the local management and the environmental coordinators while others, especially the local purchasers, find that their green procurement practices are counteracted by the management.

14.3 The influence of organisational subcultures on green procurement in Elsam

The departments are subject to the same policies and procedures but the practices differ. In the following section the main characteristics of the subcultures are presented and it is discussed how they influence the green procurement practices.

The environmental policy is mainly seen as a strategic tool that is of relevance for the central departments, whereas the power plants do not consider the policy when they prioritise their environmental effort. As the policies are of limited relevance for the green procurement practices locally, the subcultures in the departments become even more important.

Limited environmental knowledge in the departments makes it difficult to implement green procurement: The purchasers in these departments do not understand the purpose of green procurement and do not find that they have an important role in the environmental efforts of the organisation. The departments where the environmental coordinators explain the purpose of and assist the purchasers in implementing green procurement do not have these problems. Securing access to environmental knowledge is one way to influence the subcultures and facilitate the implementation of green procurement.

The employees at the power plants do not apply the green procurement procedure regularly in their procurement practices. The purchasers at half of the power plants included in the analysis choose only to make environmental assessments of the main suppliers whereas the other purchasers assess all the suppliers. The attitude towards green procurement is, among other things, dependent on support from the management. Thereby positive meaning structures related to green procurement among the managers of the power plants are important for the implementation of green procurement practices.

Only a few suppliers are rejected based on the environmental assessments. The purchasers do not find that implementing green procurement leads to changes in their selection of suppliers or improves the practices of the suppliers, and thereby the purchasers are not motivated to assess the suppliers. The interaction between the suppliers and the purchasers related to green procurement is based on information exchange rather than dialogue. A self-reinforcing effect occurs: The demands set for the suppliers do not lead to any real changes and therefore the purchasers are not motivated to set new demands or in other ways improve the green procurement practice.

The purchasers who value green procurement as a part of good purchasing practice are more proactive and persistent towards assessing the suppliers before they are approved and used at the plants. Some of the driving forces for getting the purchasers to value green procurement are to know why green procurement is important for the company and support for the green procurement practices from the local managers.

The levels of internal interaction influences the purchasers' access to technical environmental knowledge and thereby the conditions for setting product specific environmental demands in the procurement process. A tradition for collaboration with EKM seems to facilitate implementation of green procurement. At the departments, where the environmental coordinators have an environmental education, employees find the implementation of green procurement easier as they have easy access to help when they face challenges in the green procurement processes.

However, the central department and the local power plants have limited interaction due to an organisational set-up where the power plants have to pay for assistance from EKM. One power plant is situated next to EKM and this leads to frequent interaction and thereby a better understanding of the reasons for implementing green procurement. The project department also involves EKM in the green procurement processes and together they have developed a tool, an environmental assessment procedure, specifying how EKM should be involved in the tendering process.

At some departments the purchasers feel ownership of the green procurement initiatives and this is an important enabler for implementing green procurement. But, how can local ownership be established? First of all decentralising the responsibility for adjusting procedures to the local context is important, and for this to be possible the tools developed need to be flexible.

The findings in the differences in the subcultures in Elsam lead to recommendations for changes in the green procurement practices. These are presented in the following.

14.4 Recommendations for green procurement in Elsam

A number of challenges were identified in the case analysis, both in the planning and the actual implementation of green procurement. These challenges form the basis for a number of recommendations presented in figure 42 (see also chapter 13).

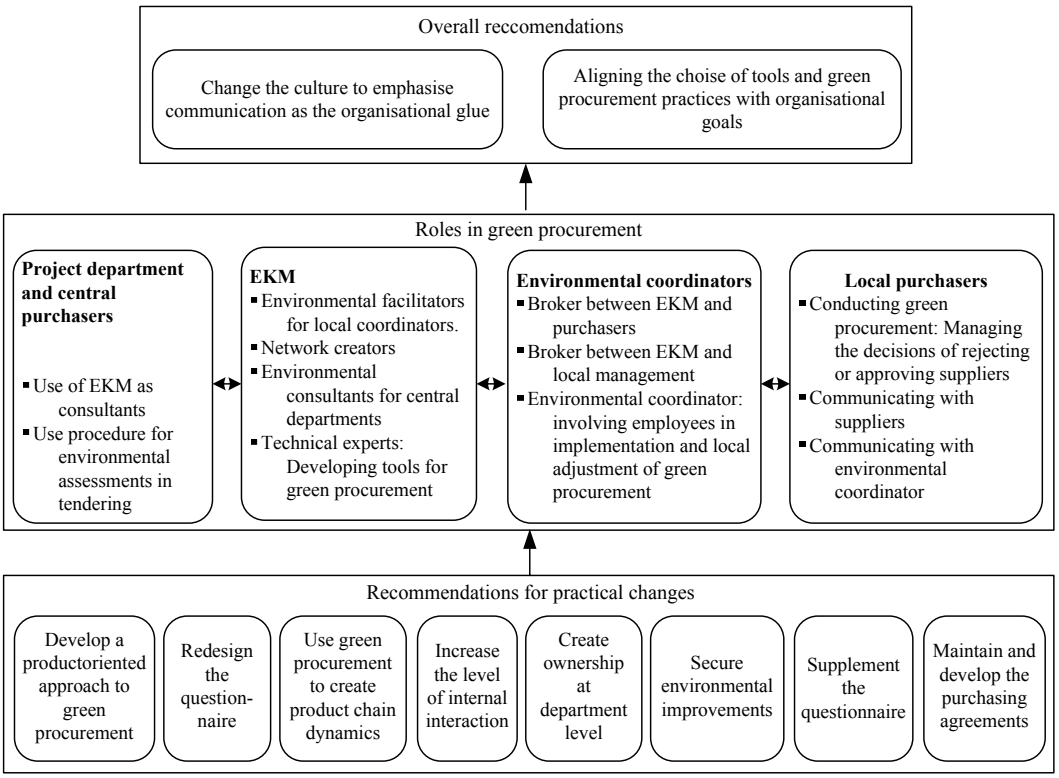

Figure 42 Overview of recommendations for facilitating the implementation of green procurement in Elsam.

The challenges for green procurement in Elsam have their point of departure in the existing practices and artefacts. The analysis reveals a need for more flexibility in the artefacts that the purchasers apply in their green procurement practices, namely the procedure and questionnaire. In the bottom of figure 42 the specific recommendations for practical changes in the current procurement practices are presented.

The recommendations for practical changes form a foundation for changes in the environmental roles, presented in the middle of the figure.

These changes in roles address the problem that local access to the technical competence is not sufficient, as an important barrier for the green procurement practices is limited support from the local managers at the power plants. Therefore the implementation of green procurement should not only address green procurement practices at the operational level but also secure support from the tactical and strategic level, e.g. by giving decisive power to the purchasers to approve or reject suppliers based on environmental assessments.

The environmental coordinators should work as brokers to facilitate coordination and alignment between the perspectives of EKM, the purchasers and the local management. Thereby they should facilitate the implementation of green procurement practices and have the possibility to address conflicting interests.

Based on the suggested changes in the green procurement practices and the changes in the roles in the organisation two overall recommendations are developed:

1. *Change the culture to emphasise communication as the organisational glue.* The purpose of this recommendation is to shift focus from artefacts such as tools, procedures and policies to communication. This means, among other things, that EKM should have a more communicative role and that their position in the organisational structure should be reconsidered.

2. Align the tools and green procurement practices with company goals. To align the tools with company goals, it is necessary to distribute the technical competencies in the organisation. This can be done either by placing more technical competences locally or securing that there is easier access to these competencies.

14.5 How implementation of green procurement is influenced and facilitated by organisational subcultures

A synthesis of the results of the analysis is presented in the following by addressing how the implementation of green procurement is influenced and facilitated by the subcultures. This is done by discussing enablers and barriers for implementation of green procurement.

In the case analyses a number of enablers and barriers for green procurement are identified by analysing the collective meaning structures for local and central purchasers. Some of these are presented in figure 43.

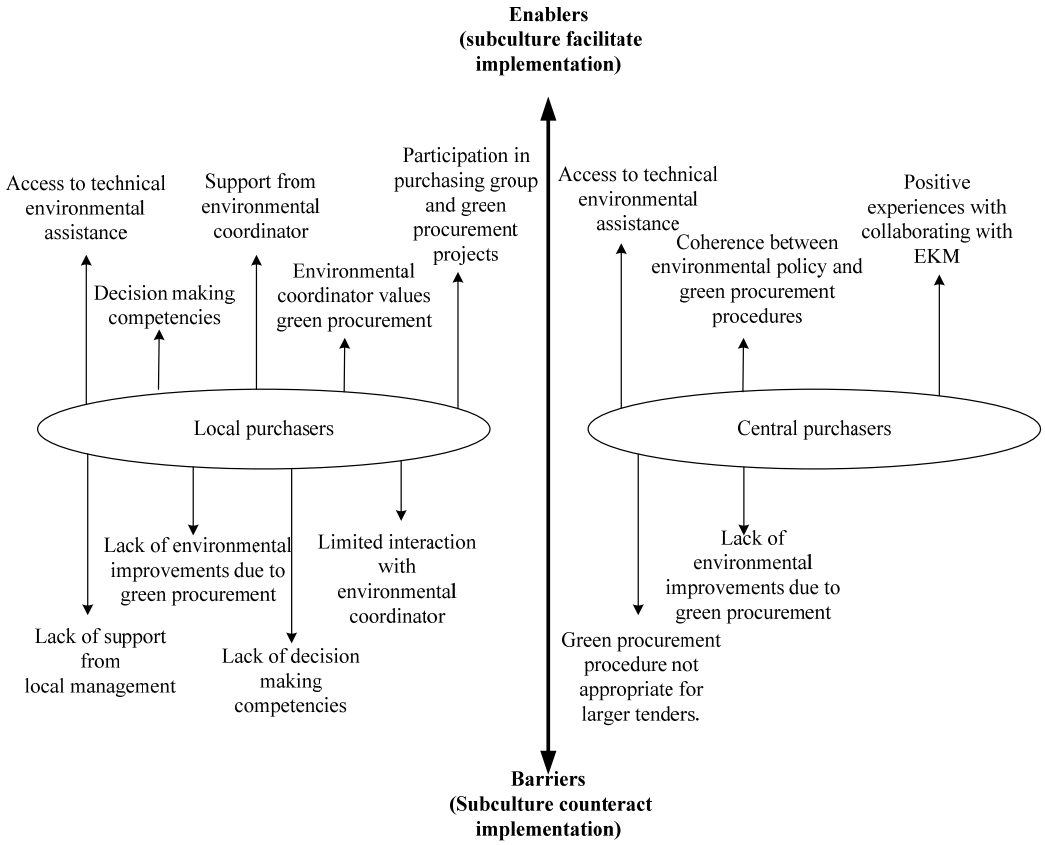

Figure 43 Enablers and barriers for green procurement, identified in subcultures in Elsam.

The lack of enablers can be seen as a barrier. Thereby the enablers in one subculture can be a barrier in another if they are not present; in the figure the barrier or drivers are illustrated in the way they were identified in the cases. This is illustrated by having decision making competencies as enablers and the lack of decision making competencies as barriers. In the case analyses it was easier to identify the barriers that counteract the implementation of green procurement. Once the barriers are identified their presence as drivers in other subcultures becomes more visible.

In order for subcultures to facilitate green procurement, the meaning structures have to work for and not against the purchasing practices. Therefore, it should be considered how to secure that the aspects with a positive influence are present whereas those with a negative influence should be counteracted. The results of this are the recommendations presented in the previous section (see section 14.4).

The main enablers for implementing green procurement are:

- Stimulating implementation of green procurement through empowerment
- Having access to environmental knowledge
- Visibility of green procurement and positive experiences
- Alignment between policies, procedures and tools

The subcultures at the power plants can facilitate green procurement if the local purchasers possess the decision making competencies that make them capable of setting demands for the suppliers and thereby making green procurement more than just a symbolic tool, as is the case to some degree at Enstedværket. In order to make the purchasers value green procurement they need to understand the purpose of green procurement and secure that they are assisted when in doubt of how to handle the green procurement practices.

The values related to green procurement at the power plant seem to originate from the local environmental coordinator and are then adopted by the purchasers. Thereby the coordinator's motivation for and communication about the implementation of green procurement is important. Nordjyllandsværket is one of the cases where the influence of the environmental coordinator is the main enabler for green procurement.

The central purchasers, especially the project purchasers, are used to assist the consultants in their work, and therefore they find it obvious to include EKM in the tendering processes. In order to facilitate the development of supportive meaning structures there is a need for coherence between the environmental policy, the impacts of the projects and the environmental demands for the suppliers. Therefore the development of an alternative environmental assessment procedure, where the environmental demands are specified and made context specific from project to project, has positively influenced the meaning structures related to green procurement.

14.6 Reflections on applied methods and theories

The purpose of this section is to validate the results and conclusions in the thesis by discussing the strengths and weaknesses of the applied methods and theories for answering the research question. The reflections are also applied as a way to consider areas where the study could have been supplemented.

14.6.1 The case study

The methodological choices made in this thesis influence the results of the case study. This section addresses the following choices and their implications:

- Choosing an analytical approach instead of action research in the case study
- Investigating the internal but not the external actors related to green procurement
- Focusing on purchasers and environmental coordinators but not the managers
- Using qualitative and not quantitative data

In the case study, an analytical approach has been applied and thereby deselecting action research. The interactive approach in action research could have created a different balance between problem solving, experimentations, analysis and reflections. Action research could be both relevant and interesting to apply in the potential next steps of the case study when implementing the recommendations developed in this thesis, as it would provide a possibility for balancing the practical activities related to the recommendations with the analytical approach. One recommendation is to educate the environmental coordinators in order to facilitate a change in their roles. In this process action research could be applied in order to understand and facilitate the change process both related to the education of the coordinators, discussions on how to change their roles and also analysing the local changes this leads to.

The choice to focus on internal actors in the implementation of green procurement is based on the experience gained in CEMIP stressing that the internal implementation of green procurement practices can be challenging. This is a central delimitation as green procurement involves external stakeholders such as suppliers, customers and to some extent regulation and knowledge networks. A possibility for supplementing the research is therefore to include the external stakeholders that influence the green procurement practices. In relation to the recommendations for changes of the green procurement tools including the suppliers could provide a possibility for examining whether green procurement induces actual environmental improvements. The differences in practices in green procurement might be related to the types of suppliers they deal with; from suppliers of paper and detergents to large projects for developing e.g. new power plants. This relation between the subcultures and the types of supply could be analysed more specifically, even though it is indirectly addressed by discussing the adjustments made for green procurement, for example in the project department.

In the analysis, the policies and goals of green procurement are not discussed. These are more or less taken for granted and the focus is instead placed on discussing how practices and tools can be aligned with the policies. With this in mind it was chosen to interview the people that develop and implement tools rather than those who develop the policies. Interviews with the top management in DONG regarding the strategic considerations with green procurement could be an interesting supplement to the analysis. This could have provided insight for discussing changes in the policies and goals that form the basis for the tools and procedures of green procurement.

This leads to the next discussion topic, namely the desired green procurement practices. It is assumed in the case study that the practices should be aligned with the goals for green procurement in the organisation and, on a more strategic level, also the environmental policy. Thereby it is also assumed that the practices and not the policies should be changed. The opposite is also a possibility, namely changing the ambition level for green procurement in the policies and procedures. In some organisations the practices might be better than the policies and in that case the basis for improvement is the policies.

The case analysis is based on qualitative data in order to answer the research questions, as the analysis focuses on the respondents' understanding of green procurement and not, for example, how often the purchasers on average conduct a supplier evaluation or other quantitative measures. The analysis could be supplemented with more descriptive analyses, based on quantitative data that builds upon the findings in the explorative analyses. Thereby the analysis could have the following steps:

1. Identification of enablers and barriers for green procurement. (Qualitative analysis)
2. Investigate the commonness of the enablers and drivers. (Quantitative analysis)
3. Investigate transfer of enablers from one department to another. (Qualitative analysis/Action research)

The quantitative data collection could address questions such as: Does the environmental assessment procedure lead to changes in the practices of suppliers? How often are the purchasing procedures used? How many suppliers are rejected? These questions are addressed in the descriptions of the company provided by the central actors in EKM, but not investigated further. On the other hand more than half of the environmental coordinators and local purchasers were interviewed giving insights of, amongst other things, the use of the purchasing agreements, the rejection of suppliers and the level of interaction between the purchasers and the suppliers.

The last discussion topic related to the methodology is how I (the researcher) influence the findings. As discussed in the methods chapter I try to be as objective as possible by not letting my ideas of how green procurement should be organised and implemented influence data collection, for example the interviews. However, in some areas, my own interests and background as an environmental planner influence the research:

- The focus in the interviews are based on predefined topics that I have chosen according to my background in theory as well as previous experience with green procurement and environmental management in companies in general. I posed open questions in order counteract this by facilitating the possibility for identifying new topics.
- The quotes applied in the case analyses are chosen from what I find to be interesting and the interpretation of them is also related to my interests and knowledge. The preliminary results are presented to employees in Elsam in order to validate the analysis.

Based on these considerations the case analysis is coloured by both the researcher and the organisational context at the given time. In order to evaluate the research results the preliminary results were discussed with both central and local employees in Elsam, more specific the employees at Skærbækværket and the employees in EKM. They found that it was interesting and, more importantly, they agreed with the results; both the more general results and the results from analysing the single departments. Systemising this validation process, and presenting the final results in the various departments could, with the benefit of hindsight, have been beneficial for further verification of the results in the thesis.

The reliability of the study refers to the extent to which results are consistent over time and if an accurate representation of the case is provided. The results of a reliable analysis can be reproduced under a similar methodology. The possibility for reproducing the results might not be possible: At the time the interviews were conducted the implementation of the green procurement had been a ‘hot topic’ in the organisation for about a year. The respondents had the implementation process, their frustrations as well as positive experiences in fresh memory. If the analysis were made today the results might be different, as the perceptions of the respondents are related to the context and specific time. Today a new green procurement procedure has been introduced at the plants, due to the merge with DONG. Thereby other aspects would be in focus if the purchasers and coordinators were interviewed today.

14.6.2 The theories applied

This section has two main elements. Firstly it is discussed how the analysis is based on both an understanding-oriented and a more instrumental approach. Secondly, the application of theory is discussed and it is addressed why a more process oriented theory was not chosen from the beginning of the study. Lastly some alternative theoretical approaches are addressed.

The applied theory, an understanding-oriented approach, is based on a wish to understand the subcultures in Elsam. This understanding of the case led to the identification of a number of challenges in the green procurement processes. The second step in the case study is more instrumental; recommendations for changes in the green procurement processes in the organisation are developed.

What difference does the use of the 'Theory of Reality' make for the case analysis? Would the findings and recommendations have been the same if another theoretical approach had been applied? Answering these questions depends on assumptions, but nonetheless the appropriateness of the chosen theoretical framework is worth a comment.

In the case analysis a static picture of green procurement in the organisation is provided, and the implementation process leading to this picture is reflected upon by the respondents. Another way of investigating the implementation of green procurement is to interview the respondents before and after the procedure is introduced, and discussing the changes that occur. The theoretical framework developed in Henriksen et al. (2004) builds upon the latter approach with comparable sets of data collected over time.

Analysing the development and implementation of the green procurement procedures might have revealed interesting aspects, for example through participation in meetings and making text analyses of minutes from meetings and procedures. Such a semiotic approach to communication studies might reveal a better understanding of the choices made in the implementation process, for example why it was decided to develop one common procedure for green procurement.

Some process oriented theories have been "borrowed" from Etienne Wengers' understanding of "Communities of Practice", which has been a supplement to the theory of organisational reality. It would be interesting to include Wengers understandings as early as the development of the theoretical framework, to form the basis for the interviews and find out if this revealed new insights in the processes in the organisation. However the case company was interested in an analysis showing the differences in the subcultures in the departments and the theory of organisational reality was found to be useful in this regard.

A delimitation is made in the thesis as I am not studying green procurement practices in other organisations. A comparative study could form the basis for evaluating the practices in Elsam related to experiences and practices in other companies. When not having an "external" reference the alignment between the policies and the practices in the company is in focus, and thereby the appropriateness of the policies are not in focus. The focus is instead analysing what creates the differences in the departments related to the green procurement.

This thesis gives recommendations based on promoting identified enablers and counteracting identified barriers. The thesis can create a basis for a more instrumental approach in the organisation by taking the recommendations presented in section 14.4 and exploring the possibility for supporting them with guidelines and tools in order to make them operational.

The analysis included practices, artefacts, values, reasoning and communication. If the theoretical framework focused on one of these aspects, for example values and how these influence the implementation processes, it might have revealed more insight into why some subcultures resist changes related to green procurement while others adopt it almost without question. However, a comprehensive picture of the lifeworlds related to green procurement is seen as necessary to discuss the implementation process. The understandings of the actors and their practices and following the recommendations for changes have a more general character than would have been the case in a more specified study.

In the beginning of the research process it was considered to address communication theory more specifically, but delimitation from this is made later on as the theoretical focus in the thesis is organisations and not communication practices as such. Analysing communication practices, with a semiotic view, might have revealed other insights related to the case, for example a more thorough understanding of the text and how the terminology is applied in the questionnaire, procedures and policies. Applying communication theory in the analysis could provide an insight into the organisation's internal communication paths and how they could be altered. Analysing the codes and language both in written documents and oral communication might reveal insight into the kind of knowledge and information there is present and what is needed in the different departments in the organisation, for example how brokers can apply different means of communication.

The theoretical framework is not chosen to address inter-organisational relations in the product chains. Network theory or theories of supply chain management are a possibility for supplementing the theoretical framework to address these inter-organisational relations. Including tools for supply chain management could form the basis for instrumental analyses of the environmental changes in the practices of the suppliers that green procurement in Elsam leads to, and developing recommendations for improvements.

Network theories can be applied to map the relationships between individuals involved in the green procurement, both internal and external, and thereby to develop the understanding-oriented view further.

14.7 Perspectives

The environmental efforts of Elsam have developed from focussing on the production to a focus on the products in a life cycle perspective. This has created challenges as new competencies and new environmental roles need to be addressed in the organisation. Environmentally proactive organisations around the world face similar challenges as their environmental efforts develop in a similar manner.

In the following, perspectives related to the relevance of the results after the merge between Dong and Elsam are addressed and afterwards the relevance to other companies and their increasing need for managing global product chains.

The merge between Dong and Elsam in 2006 and the establishment of Dong Energy has caused structural changes in the organisation which, one way or the other, influences the possibility for applying the recommendations in this thesis.

One of the changes is that the main environmental department is now situated in Copenhagen but the environmental department related to "Generation West" (the old Elsam) is rather similar to previously. Some employees in the old "EKM" department have been replaced but the department still exists. Thereby the organisation of central and local environmental coordinators and purchasers is basically still the same.

The green procurement procedures have changed as well and are, to some extent, more product-oriented than the old ones. The responsibility for implementing the procedure is still placed with the purchasers, and the central purchasing department still develops purchasing agreements.

The recommendations for practical changes must be considered in the new organisational context, with the revised green procurement tool and changes in management. The recommendations are, to some degree, independent of the chosen green procurement tool and the new management, as they are developed based on the challenges seen locally by the purchasers and environmental coordinators. The environmental coordinators and the purchasers are still the same and the purchasers still need to understand the purpose of the green procurement tool and the content of the questionnaire. Thereby the challenges for implementing green procurement tools in the organisation are similar to those that existed two years ago. On the other hand changes in priorities and initiatives related to green procurement might influence this.

The recommendation for changing the roles of the purchasers and environmental coordinators could also be also important in the new organisation. Change of the roles can be difficult: In EKM most employees are hired as consultants and their interests are related to technical environmental issues. Those that traditionally have been facilitators for the power plants still lean towards this role and collaborate with the power plants more than the others. It is a similar case with the local environmental coordinators; those that originally were hired as safety coordinators do not value external environmental issues, even though it is their responsibility to do so. With new employees in EKM it might be easier to establish the new roles, as they do not have a long tradition of collaboration in the organisation.

Establishment of an environmental network in the organisation with distributed environmental competencies is even more important when the organisation expands. The risk is that the distance increases between the central environmental departments, where strategies are developed, and the local departments, where the environmental improvements are implemented.

DONG is not the only company facing these challenges. As illustrated in the first chapter numerous tools for environmental communication are available. The CEMIP companies face challenges in the implementation of the communication tools as new ways of collaboration between the departments need to be established (see chapter 2). The discussion about subcultures is relevant in other organisational settings as well.

Other organisations might face the same challenges of whether to centralise or decentralise the technical environmental competences. Organisations can choose to centralise the competences making it possible to let the single employees be specialised within a narrow environmental field whereas a decentralisation can be a strategy for facilitating the local implementation. Other companies might wish to distribute the competences and environmental specialists in the organisation forming a network of environmental coordinators who have both technical competences and daily contact to the local departments. Both alternatives call for brokers and network creators in order to implement corporate standards in the environmental communication practices. In other words, organisations face challenges in establishing collaboration between the departments. If the competencies are centralised the relevant knowledge should be distributed in the organisation, for example to the purchasers. If the competencies are decentralised collaboration is needed to secure that the departments all strive towards the same organisational goals.

The climate debate, product oriented regulation and the increasing focus on CSR all call for supply chain management. Some companies see this as a potential to establish a closer collaboration with the suppliers, and use them as partners that not only provide products but also knowledge and technology.

The present climate debate sets energy consumption in the spotlight, opening a potential for organisations consuming large amounts of energy. Those that already work with product chain management can benefit from collaboration in their product chains. For companies to know the energy consumptions associated with their products they need information from their product chains. To mention one example; companies need information regarding energy consumption from the product chain in order to know the carbon footprint of their products.

In the electronic sector product oriented regulation has been introduced in the European Union both related to the energy consumption, waste and use of chemicals related to the products. This has created a situation where it is important for the organisations to get information from the product chains and establish collaboration with suppliers in order to meet the demands and set green procurement on the agenda.

Furthermore, the number of companies working with corporate social responsibility is increasing. An indicator of this is that close to 5000 companies have assigned to the UN Global Compact since it was launched in July 2000. The Global compact is based on a set of core values that they ask companies to embrace, support and enact within their sphere of influence, in the areas of human rights, labour standards, the environment, and anti-corruption. In order to do this, supply chain management is essential. As an example; in the area of human rights the Global Compact addresses silent complicity - the failure by a company to raise the question of human rights violations in its interactions with stakeholders. (Global Compact, 2008) This means that companies shall actively address their compliance with the Universal Declaration of Human Rights in their product chain. Considering the aspects of CSR, then a more appropriate term than green procurement would be “sustainable procurement”.

For companies to meet the challenges related to the climate debate, product oriented regulation and CSR, an environmental toolbox is not enough; environmental communication is needed to support both the internal and external coordination of environmental initiatives and knowledge exchange. This is necessary to be able to choose the right set of tools, implement them in a concrete context and thereby benefit from them in a way that goes beyond the symbolic values of applying the tools.

Reference for chapter 14

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Appendix I: The CEMIP companies

This Appendix describes the companies in CEMIP, their status in environmental effort, their wishes to the CEMIP project and their results of the project. Firstly each of the CEMIP companies and their work with environmental issues is shortly described.

Coloplast

Coloplast was established in 1957 and listed in 1983. Coloplast develops, produces and markets medical equipment and services. In September 2007 Coloplast had more than 7.000 employees. The main business areas for Coloplast are products for ostomy patients, urology and continence remedies and bandages for the care of chronic wounds and skin care. They primarily sell their products to the professional health care market. (Coloplast, 2007)

Coloplasts' manufacturing companies in Denmark have been certified according to ISO 14001 since 1997 and are certified according to OHSAS18001. The environmental management system focuses on the production units and not departments like purchase and sales. Coloplast signed the Global Compact in 2003. (Schmidt, Mosgaard et al., 2004)

Coloplast makes an assessment of a potential supplier, including a few environmental aspects, before they are accepted. After the initial approval, no systematic follow up on the performance of the suppliers exists; this is based on the purchasers' intuition of where it is necessary. Coloplast have planned to integrate elements from Global Compact in the environmental assessments in the future. (Schmidt, Mosgaard et al., 2004)

Coloplast forms partnerships with their suppliers in order to secure the technological development, but besides the partnerships they have limited knowledge of the environmental performance of their suppliers. Internally the environmental effort in Coloplast has focused on the environmental management systems, including environmental considerations in product development. They have planned to develop the environmental profile in relation to marketing and sales in the future. (Schmidt, Mosgaard et al., 2004)

The main expectations from Coloplast to the work in CEMIP was to develop the green procurement, develop an internal acceptance of environmental issues in order to facilitate the external relations through sales and marketing, demonstrate that environmental communication creates business value and exchange experiences with other companies. (Schmidt, Mosgaard et al., 2004)

Through the CEMIP project, sustainability issues were included in the supplier evaluations and the purchasers in Denmark, USA, Hungary and Germany are trained in the process of integrating the sustainability issues in their work. They have also developed factsheets that are distributed in the organisation with the purpose of assisting e.g. sales and marketing in discussing environmental issues with external stakeholders. (Schmidt et al., 2007)

Hartmann

Hartmann is a packaging company that develops, produces and sells moulded-fibre packaging. Hartmann focuses on two business areas; Egg Packaging and industrial Packaging. Hartmann has its headquarters in Denmark but has subsidiaries several places in the world. Hartmann is listed on the Copenhagen Stock Exchange. The total number of employees' world wide is approx. 1900. (Hartmann, 2007)

The Danish production sites in Hartmann are certified according to ISO 14001 and OHSAS 18001. Hartmann works actively in implementing LCM in the production. In September 2003 Hartmann joined the UN Global Compact. Hartmann has a long tradition for profiling themselves on environmental issues both related to the consumers and the general public. They are proactive in including environmental issues in sales as they find that environment is an important competitive resource for them. (Schmidt, Mosgaard et al., 2004)

Hartmann has developed "Step by Step" a document that describes how each department should act according to the suppliers. The initial assessments of the suppliers include questions about environmental impacts, environmental policies and goals and LCA. After identifying the relevant suppliers they get a new questionnaire that forms the basis for rating the suppliers. (Schmidt, Mosgaard et al., 2004)

The main expectations to CEMIP in Hartmann were a revision of the existing supplier evaluations. The evaluations were to include sustainability issues and be based on dialogue with the suppliers rather than control of them. Besides this, environmental issues in marketing and environmental communication with financiers are prioritised. (Schmidt, Mosgaard et al., 2004)

The main results of the work in CEMIP is developing and applying a revised supplier assessment tool and supplier contracts based on a collaboration process and not just sharing information. A tool for screening and risk assessments of the suppliers was also developed. Fact sheets with environmental information to be applied in the sales processes were also developed. (Schmidt et al., 2007)

Junckers Industries

Junckers Industrier A/S manufactures and sells solid hardwood floors. Junckers Industrier A/S has two main operating areas; Solid Hardwood Flooring and Surface Treatment. Junckers has production sites in six countries and representatives in more than 30. Junckers is Denmark's largest timber industry and employs more than 600 people. (Junckers, 2007)

In 1996 Junckers built an environmental management system in accordance to ISO 14001. Because of the importance of physical health and safety issues they also focus on these aspects. In 2002 they were certified according to ISO 14001, EMAS2 and OHSAS 18001. Junckers has published green accounts since 1998 and develops life cycle assessments for their products. (Schmidt, Mosgaard et al., 2004)

Abolition of illegal foresting and appliance of the environmental labels FSC and PEFC on wood are in focus at Junckers, primarily because of their stakeholders, mainly NGOs that focuses on these issues. Junckers has difficulties in maintaining the supply of FSC marked wood and therefore has difficulties in meeting the demands from the customers, as they focus on this label. (Schmidt, Mosgaard et al., 2004)

Junckers do not buy the most costly parts of the wood. Therefore it is difficult for them to set demands for the suppliers; they have limited power as they are relatively small customers seen from the individual suppliers' point of view.

The main expectations for the CEMIP project is getting inspiration from the other companies, especially in relation to developing product oriented marketing, to develop information for specific customer groups and to get the suppliers motivated in relation to sharing environmental data with Junckers. (Schmidt, Mosgaard et al., 2004)

The main results of the CEMIP project were a revision of their existing "Environment in Sales Manual" applied in the sales processes. The environmental reports were improved by applying the "Bridge" model. Bridge is a tool developed in CEMIP called "Building Relations and Interests through Dialogue" that secures concordance between e.g. organisational policies and content of communication. Environmental product declarations were made for their products and finally social issues were included in their supplier handling, especially in Asia. (Schmidt et al., 2007)

Vestas Wind Systems

Vestas was established in 1979 and in 1998 they were listed on the Copenhagen Stock Exchange. Vestas manufactures, sells, markets and maintains wind power systems and is one of the largest producers of windmills in the world.

The headquarters are in Denmark but they have subsidiaries all over the world and employ more than 13,500 people. (Vestas, 2007)

Health and safety management has a high priority in Vestas and the Danish production sites are certified according to ISO 14001 and OHSAS 18001. Vestas makes life cycle assessments on the large windmills (in practice that means the newest models). (Schmidt, Mosgaard et al., 2004)

The categories of customers have changed in recent years for Vestas. Previously the costumers were primarily farmers or small groups of private persons who bought a single or a few windmills. (Schmidt, Mosgaard et al., 2004) Today selling windmills are based on business to business sales as the costumers are larger energy companies and other big costumers that buy complete wind power systems. The professional costumers have more specific demands for environmental information on the windmills than the private customers which is why life cycle assessments (LCA) and environmental product declarations (EPD) are important. (Schmidt, Mosgaard et al., 2004)

Vestas makes environmental evaluations of their suppliers. The results are seldom considered further unless the suppliers are not in compliance with the public regulation.

The main expectations from Vestas to the CEMIP project is to develop their environmental product declarations and to apply tools for visiting and auditing key suppliers regarding environmental and health and safety issues. Besides this they hope to get inspired on how to communicate their environmental achievements both through homepages and environmental reports. (Schmidt, Mosgaard et al., 2004)

The main achievements of the CEMIP project are the development of information related to specific stakeholders through LCA's and EPD's. Besides this the official communication to investors were adjusted including more environmental aspects than previously. (Schmidt et al., 2007)

Elsam (Now Dong Energy)

DONG Energy was founded in 2006 as the result of a merger involving six Danish energy companies – DONG, Elsam, ENERGI E2, Nesa, Copenhagen Energy's power activities and Frederiksberg Forsyning. Elsam is now the part of Dong Energy that is called "Generation West". Elsam generates electricity for half of the Danish energy consumption. Elsam has 7 primary power stations and 14 small-scale power stations in Jutland and Funen. Since the 1970s, they have reduced their consumption of non renewable resources by introducing renewable resources and improving the efficiency of the coal-fired process. (Dong Energy, 2007).

Elsam makes green accounts for their power plants. In 2002 they were certified according to ISO 14001 and in 2004 they were certified according to OHSAS 18001. They have a project oriented approach to environmental improvements. (Schmidt, Mosgaard et al., 2004).

Elsam makes environmental assessments of suppliers both centrally when they make larger purchasing agreements and locally with the suppliers for the power plants. For further introduction to Elsam see chapter 5.

Elsams' main expectations for CEMIP were to develop information and standardized answers for the financiers. They would also like to put focus on the internal communication processes and put environmental issues on the internal agenda, and secure implementation of supplier evaluations at all levels in the organisation. Another point is how to optimize the purchasing agreement so that the appropriate questions are asked and trustworthy answers are gained.

Through the work in CEMIP, Elsam has developed a tool and a model to visualize communication profiles for different internal actors, based on ethical considerations, called the argument matrix. Another result is a description and analyses of the means that were applied to handle and influence the stakeholders in a strategic project; the VEnzin project. The results from this thesis are also an important output for Elsam.

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Appendix II: Tools developed in CEMIP

Homepages and BRIDge

In CEMIP the information that the companies have on their homepages is discussed frequently. What is especially striking is that companies often put their environmental reports on the homepage without using the possibilities for streamlining the information in relation to the relevant stakeholders. Having several entrances to the environmental information on the homepages related to the different stakeholders makes the homepage more usable and relevant for the single stakeholder. In CEMIP a tool was developed called BRIDge (Building Relations, Interest and Dialogue). The bridge model is illustrated in table 27.

	Are we working with it	Included on homepage?	Stakeholder A	Stakeholder B	Stakeholder C
Supply chain management	X	+	-	-	-
Employee participation	X	-	+	+	+
Environmental impacts (LCA)	X	+	-	-	-

Table 27 Illustration of the BRIDge Matrix, the subjects included are just examples, it is not an exhaustive list.

The matrix gives an overview of which stakeholders are addressed and which stakeholders could be addressed. Likewise it shows the interest of the different stakeholders and whether or not the organisation is working with these issues. (Schmidt and Mosgaard, 2007)

Homepages and environmental reports are two of the communication media where the BRIDge model can be used in order to secure that the appropriate information about the organisation is presented.

Green accounts

Both Vestas and Elsam are developing green accounts each year. The green accounts are sent to the relevant authorities as they are obligated to do so. They have experienced that some knowledge institutions are also interested in the green accounts for research projects. Every once in a while financial rating companies also read the green accounts but generally the amount of stakeholders are limited and they do not respond directly to the information they are given.

Environment in Sales Manual

Junckers has developed an "Environment in Sales Manual" where the salespersons can find the environmental information that is necessary in the communication with the costumers. The manual is updated regularly on the basis of experiences from the sales persons. The sales personnel have participated in the development of the manual and use it frequently. (Schmidt, Mosgaard et al., 2007)

e-dialogue

Hartmann uses another tool in the sales process, namely the e-dialogue. It is an interactive program where the sales personnel can type in the specific needs of the costumer. The main purpose of the tool is to show that it is feasible in a life cycle perspective to choose the products from Hartmann compared to plastic packaging. It also calculates the taxes on the different packaging. Both costumers and sales personnel like the interactive tool. The environmental department participates in the meetings if the costumer needs more specific LCA data.

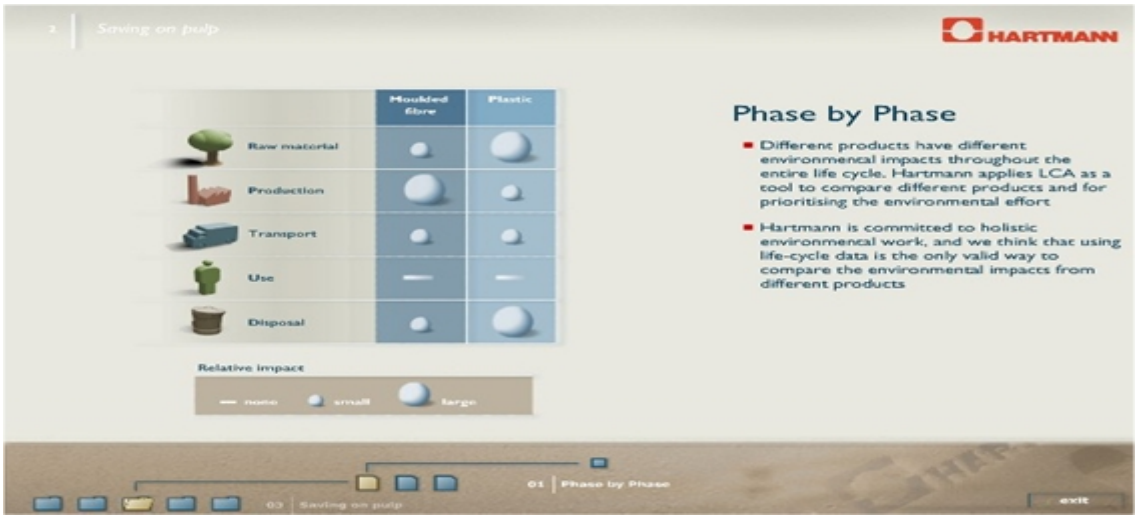

Illustration E-dialogue (Kim Hilding Hansen in Schmidt, Mosgaard et al., 2007).

Fitness test

Fitness tests clarify the similarities and differences between the organisational policies and practices and the customers' policies and practices. When knowledge about the environmental practices of the customer is limited, it is easier to focus on the formal policies and environmental targets as these often are accessible at the homepages. After comparing the two sets of policies it is described in which areas the profiles match and this can be applied in the sales material for the customer as an argument for choosing this specific organisation as a supplier. The fitness test is only applicable if the customer focuses on environmental issues. (Schmidt and Mosgaard, 2007)

Reducing the risk in the supply chain

Risk in the product chain is to be handled in both a broad and a narrow perspective. The environmental and ethical issues can occur almost everywhere both at the large producer of chemicals and in the small printing house, and also in a global perspective from China to Europe. On the other hand, it is also necessary to act specifically in relation to the suppliers where the risk of significant environmental problems is high. Therefore Coloplast have developed a tool to handle both the broad group of suppliers and the ones with the highest risk.

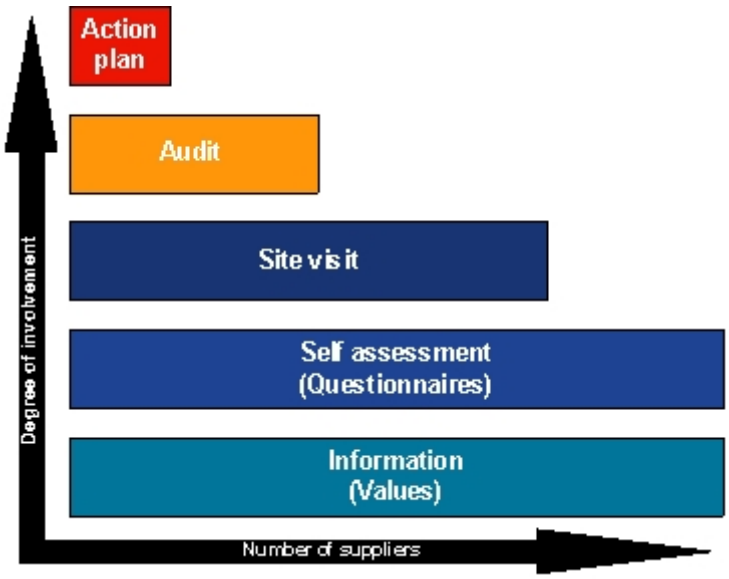

Figure 44 Illustration of the different tools that are applied in reducing the risk in the supply chain. (Mikkel Skott Olesen and Caroline Jessen, Coloplast A/S in Schmidt, Mosgaard et al., 2007)

Information about the values of Coloplast and the questionnaires for self-assessments are sent to all the suppliers of Coloplast. This signals the importance of environmental values at Coloplast but also has some delimitation as the quality control of the questions to the questionnaires is difficult.

For the suppliers that are assessed as having a higher risk site visits are made that can lead to actual audits and action plans for improvements. The risks of the suppliers are assessed from several issues; the geographical location of the supplier and the history of risks in that region, the size of the supplier (measured in amounts of goods purchased from them) and the experiences with the supplier.

Suppler questionnaires

All the CEMIP companies have applied questions relating to environmental issues in their purchasing processes. Some focus on the environmental policies, goals and action plans of the supplier, some focus on social issues and some focus on the environmental impacts from the products purchased from the supplier. There are also differences in the frequency of the appliance of the questionnaire. Some make only one assessment of the supplier and thereafter it can be used in the purchasing processes. Some evaluate their suppliers on a regular basis to identify whether they improve their environmental performance and others make environmental assessments of each new product they decide to purchase.

References for Annex II

Schmidt, Mosgaard et al (2007): CEMIP håndbogen; **The CEMIP handbook** with a presentation of the tools that are developed and tested in the CEMIP group. 2007. Published at www.cemip.dk.

Appendix III: Organisations as rational, natural and open systems

In this chapter organisations are presented as rational, natural and open systems. The three perspectives of organisations do not illustrate three different types of organisations but three ways of thinking when investigating organisations. Dependent on the perspective, the analysis will result in different interpretations of the organisation and the changes you wish to examine. The three perspectives partially overlap and conflict with each other. In this chapter each of the perspectives are presented separately and finally it is presented how a combination of the three approaches is combined in order to show the historical development of analyses of organisations. This historical development inspires the development of roles in environmental organisations.

14.8 Organisations as rational systems

In the rational view upon organisations there is an emphasis on two structural characteristics that separate organisations from other entities:

Organisations are units that work towards specific goals. Thereby the actors' activities and interactions are determined by accomplishment of these specific goals. Specific goals means that they are clearly defined and give criteria in relation to choice between alternative activities. It is not the selection of the goals that are seen as rational but the implementation of the goals. It is a restricted definition of rationality, as companies might pursue irrational goals with rational means. In the rational system approach terms like information, efficiency, rules, control and implementation are important. (Scott, 2003).

The goals represent the desired ends, and the specific goals make it possible to select among alternatives. If the goals are vague they do not fit into a formal organisation, but the goals can become specific in a limited amount of time. (Scott, 2003)

Environmental policies can be seen as one of the goals of an organisation. If the environmental policy is weak, or vague in the sense that it is not specific, the solution in the organisation can be to set time-limited targets in order to interpret the policy so that it becomes more specific. These specific targets then determine the activities in the environmental arena in the companies. This follows the dynamics of environmental management.

Rational organisations are units that have a high degree of formalization. The formalization is linked to the rules, as the rules are specific and govern the behaviour of the individuals. Another aspect of the formalized structure is the roles of the employees that are linked to the position in the organisational structure. The roles are independent of the positive or negative feelings the employees have for one another; the behaviour is not governed by social norms. The collaboration between the actors are deliberate and "on purpose". This means that the relations are explicit and can be constructed and reconstructed deliberately. The degree of formalization in a structure is determined by the rules that control the behaviour, through the explicitly in their formulation, and the roles of the actors are determined independent of personal characteristics. This makes it easy to replace one trained person with another with minimal disturbance of the organisation. The formalised structures are thereby independent of the participation of any specific individual, but dependent on trained personnel. The rules and roles make the behaviour of the individuals more predictable or standardised and thereby formalised. (Scott, 2003)

The organisational structure can, in the rational system be viewed as a mean to control the performance, and can be modified in order to change this performance. In the rational approach it is the combination of a high degree of goal specification and a high degree of formalisation that separates organisations from other groups. (Scott, 1992) With a background in the study of different organisational theorists, Scott defines rational systems as;

"Organisations are collectives oriented to pursuit of relatively specific goals and exhibiting relatively highly formalised social structures." (Scott, 1992 s.23)

It should be stated that this definition not only focuses on the distinct characteristics of an organisation, but also the normative structures. (Scott, 2003)

What elements of the companies working with environmental issues are included in the rational approach? Emphasis is on the elements included in the Ph.D. study.

	Focus area
Definition	The rational elements in the companies work with environmental communication are coupled to the goals and the formalised aspects.
Boundaries for the technical dimension	Environmental policies, tools for environmental communications, environmental management system, especially procedures and instructions Formal roles and structures in the organisation, formal relations between departments. (e.g. hierarchical structures).

The elements included within the boundary of the rational approach are primarily internal elements. Even though elements such as the environmental policies are developed internally they are influenced by the surroundings.

14.9 Organisations as natural systems

Organisations are designed from the rational system approach and they can be managed through goals and formal structures. The natural system approach emphasises that organisational systems are characterised by spontaneity and social relations.(Scott, 2003) Organisations are social systems where the members either are in agreement or through conflicts seek survival of the system.

In the natural system approach it is argued that goals do not determine actors' behaviour even though organisations often have specific goals. As a result, it is impossible to use these goals to determine organisational behaviour. Formal roles and written rules can likewise exist without significantly affecting the behaviour of the actors. The primary focus is to investigate how organisations handle the needs and demands internally in their own system. Organisations seen as natural systems are collectives. The difference from the rational system approach is then that the collectives are not deliberately constructed to seek specific goals. This means that the interconnections between the behavioural structures and the normative structures are complex. (Scott, 2003)

In the natural system approach there can be differences in the stated goals of the organisation and the "real" goals. The latter are the ones that govern the actual activities of the participants. If the stated goals are the ones been pursued they will not be the only goals governing the participants behaviour. There will also be maintenance goals, as an organisation can not function if the only goal is to produce products; they also have to maintain themselves. (Scott, 2003) This leads to the metaphor of "organisations as organisms" that emphasise the organisations drive to survive and maintain the system (Morgan, 1998) Similarities exist between the natural system approach and the use of this metaphor. The development of informal structures and distinctive cultures are important tools in the organisation. The structures develop from the actors' natural capabilities and interests, and make the organisation capable of using the advantages of the human resources in the collectives.

This illustrates the differences from the rational system approach, the organisations are not only seen as a means of reaching a specific goal; it is a goal in itself to maintain the organisation. The organisations are social groups that attempt to survive by adapting to the circumstances at a given point. If changes occur in the surroundings, and thereby in the survival conditions of the companies, they will modify their goals, in order to have a more favourable adjustment. (Scott, 2003)

The formalised structures of the companies are not neglected, but their importance is limited especially in respect to governing the behaviour of the participants. The informal structures are more important in affecting the behaviour. The individuals are not just acting according to their place in the organisational structure and their job description; they have individual ideas, expectations, interests and values. (Scott, 2003)

One of the important contributors to the natural system approach is Chester I. Bernard. He stated that an organisation integrates the contributions of the participants and thereby is a cooperative. The organisation depends on the willingness to participate, and therefore it is important to motivate the employees. This can be done through either material rewards or more social aspects such as prestige and power. This is necessary in order to make the organisation survive. They even have to compete with other organisations in order to attract and maintain a loyal and competent workforce. (Bernard, 1938)

In Scott (1992), the second definition of organisations as natural systems is defined as:

”Organisations are collectivities whose participants share a common interest in the survival of the system and who engage in collective activities, informally structured, to secure this end.” (Scott, 1992 s.25)

This definition emphasises the collective attributes that organisations share with other groups and the behavioural structures.

What elements of the company’s work with environmental communication are included in the open system approach? Emphasis on the elements included in the Ph.D. study are:

	Focus area
Definition	The natural structures in the companies related to environmental communication are primarily the social aspect.
Boundaries for the socio-cultural dimension	Organisational culture and values. Informal relations between the environmental department and the other departments. The behaviour (the practices) in the communication processes. Learning both individual and organisational, in relation to environmental aspects (The awareness of environmental issues in the organisation probably depends on actors’ knowledge of the issue). Management both in the environmental department and generally.

The elements included within the boundary of the natural dimension approach are primarily informal elements both within the environmental department and other departments included in the implementation processes.

14.10 Organisations as Open systems

In the previous definitions organisations are primarily perceived and described as closed systems, separated from the surroundings and mainly consisting of stable and well-defined actors. Organisations are not closed systems; they interact with the surroundings. They are open and depend on external relations to get personnel, resources and information.

In the open system approach the organisations are shaped, supported and infiltrated by the surroundings. The external relations are just as important as the internal, because the environment shapes and supports the organisation. The external relations can be more loosely coupled and are shifting as the external environment is continuously changing. In some cases the boundary between the organisation and the surroundings will be blurred. (Scott, 2003) (Morgan, 1998)

From an open-system perspective organisations are not fixed entities and this creates challenges related to the concepts of organisational cultures, where the culture is dependent on the members.

In the open system approach organisations are regarded as systems which are dependent on each other in different kinds of relations. The interdependence is not fixed, it varies depending of the type of system. In mechanistic systems there is a rigid structure that determines the relations; interdependence makes the behaviour limited and constrained. In organic systems there is more flexibility as the connections are less constrained. Social systems are loosely coupled, and the behaviour of one element is only to a small extent dependent on the others.

When taking point of departure in an open system perspective the differences between formal and informal structures are not regarded as important, as organisations are regarded as a system of interdependent activities; some of them loosely coupled some strongly connected. What makes the organisation exist is the ongoing production and reproduction of activities. Open systems also have boundaries; the individuals are not fixed by boundaries of the organisation, but some of their activities and behaviours will be. Materials, energy and information are the main system flows among the system elements. (Scott, 2002)

In 1956 Boulding created divisions for different types of systems; physical, biological, human and social.. The classifications relates to the systems complexity. (Scott, 2002)

Progressing from physical to social the systems become more open to the environment, more complex, more dependent on information flows, more loosely coupled and more capable of renewal and self maintenance. The systems are not mutually exclusive as each system incorporates features from those below it. Taking this approach one can gain valuable information and insight of a system by applying low-level systems to high level systems (Scott, 2002).

This means that you can get valuable insights of open systems by looking at them as e.g. cybernetic systems. Organisations as cybernetic systems are describes below.

Organisations as cybernetic systems

One of the features that define cybernetic systems is that they are capable of self-regulation, they can control their interrelated parts, and a simple example of this is a thermostat. Someone that is not regarded as a part of the system, is the person using the thermostat, but as the person is not part of the system it can be regarded as a closed system. Including the programming, functions in the system draw a link to the view on organisation as a cybernetic system. Cybernetic systems set operations, control and the policies in the centre. The objectives for the system are set by the policy centres as a response to the demands in the surroundings. (Scott, 2002). This could, for example, be the production orders for the companies, regulation or other demands. The policy centres implement the orders and they result in products and services produced in the organisation. The goals and targets are not static, double loop learning is occurring as well as feedback from the surroundings.

In other words, the behaviour of intelligent systems is guided by the visions, norms, values and limits of the organisation. These parameters set the reference point for the behaviour. (Morgan, 1998). The cybernetic approach concentrates on the operational level of the organisation. (Scott, 2002)

Organisations as loosely coupled systems

In the cybernetic system each of the parts responds to changes in the others. Organisations – especially social systems - can also be seen as loosely coupled systems; the parts are acting relatively autonomously. Rules do not necessarily determine practices; changing rules may not influence behaviour and likewise the other way around. Individuals' goals and intentions do not solely determine the practices either. A loosely coupled system has several groups and interests, each of them trying to obtain something. This is done in the interaction with others, and each of them also has their own objectives and preferences. The actors in organisations are also a part of a hierarchical system that influences their behaviour.

Organisations as hierarchical systems

Hierarchy is used in order to divide the organisation in subsystems and levels. Combining the concept of hierarchy with the aspect of loose coupling can be used in order to characterise the couplings. The connections and interdependency inside a system component are often closer than those between the different systems.

Theorists within the open system approach emphasise that individuals have different interests and values. Thereby it cannot be presumed that different actors have common goals, even to seek the survival of the organisation. (Scott, 2003). Organisations are neither seen as a formal structure or an organism, but a system of interdependent activities. According to Scott (2003) organisations seen from an open system approach can be defined as:

"Organisations are systems of interdependent activities linking shifting coalitions of participants; the system are embedded in – dependent on continuing exchanges with and constituted by – the environment in which we operate ." (Scott, 1992 s.25)

The elements included in the network dimension are dependent on both internal and external actors. Some of the activities are closely interconnected while others are more loosely coupled. In the open system approach organisations cannot be analysed or understood, without understanding the surrounding environment that influences the organisations internal work. (Scott, 2003)

What elements of the company's work with environmental communication are included in the natural system approach? The elements included in the Ph.D. study is:

	Focus area
Definition	The open system structures related to environmental communication are primarily the environmental network, and the external actors the organisation inform about their environmental goals, requests and performance. Therefore the elements included in the "open system approach" are the network-oriented elements.
Boundaries for the network dimension	Regulatory Network (authorities, mother organisation, …) Innovative network (Research institutions, consultants, branch organisations..) Business network (Suppliers, mother organisation, consumers…)

In the open system approach the different external stakeholders become important for the environmental communication. In Donaldson and Preston (1995) Different aspects of stakeholder theory are discussed. In this project, stakeholder theory is primarily seen as a normative aspect. In the normative aspect stakeholders are persons or groups with legitimate interests in procedural and/or substantive aspects of corporate activities. Their interests in the corporation identify stakeholders, whether the corporation has any corresponding functional interest in them. The interests of all stakeholders are of intrinsic value. This means that each group of stakeholders merits consideration for its own sake and not merely because of its ability to further the interests of some other group, such as the shareowners. (Donaldson and Preston, 1995)

From an open-system perspective organisations are not fixed entities and this creates challenges related to the concepts of organisational cultures, where the culture is dependent on the members.

14.11 Combining the perspectives

The combination of the perspectives forms the basis for the roles of the environmental coordinator presented in chapter 13.

Scott explains that the theoretical development within organisational theory leads to four perspectives as explained in the following. The division in the perspectives is based on two main criteria. The first major criterion is the changes that occurred in 1960 from a natural to an open system approach where organisations no longer are seen as isolated entities. The second main criteria is the change happened in the way organisations are studied going from a rational to a natural system approach, and this is both related to the closed and open system approach. This segregation gives four main approaches: The closed-rational system approach, the closed-natural system approach, the open-rational system approach and finally the open-natural system approach. (Scott, 2003)

14.12 Combining the organisational system views with the theory of reality – developing the roles of environmental coordinators

In the following there is made a scheme for identifying elements of the theory of reality that can be applied in the understanding of different roles of environmental coordinators in Elsam. (See section 13.2)

Perspective	Organisations as rational systems	Organisations as natural systems	Organisations as open systems
Reasoning	The focus is on the possibilities. Procedures, rules and methods impose actions upon actors through their built-in material logic. The formal logic also represents a rational approach, as formal logic deals with assumptions with purely formal content, where that content is made explicit	Both the social and the subjective logic are important. The social logics are important as the actors are part of a social system that partly governs their logic but they also have individual reasoning.	The development of social logics is more complex in the open system perspective, as the actors participate in different relations, both internal and external. This means that the social logic is not necessarily shared within the systems of the organisation. In loosely coupled relations the formal and material logics might become important, as methodology can be shared through formal procedures, rules and methods.
Value	The goals represent the desired ends, and the organisation work towards these goals. In the rational system approach goals and values become the same, as the social norms are not influential on the behaviour of the actors.	There can be differences in the stated goals of the organisation and the values that govern the actual practices of the participants. Social norms are important in the construction of the values, but it is individual values that govern the actors' behaviour.	Individuals have different interests and values. Thereby it cannot be presumed that different actors have common goals, even to seek the survival of the organisation. The goals that govern the behaviour are set by the interpretation and implementation of the demands in the surroundings.
Practices	Artefacts shows features of the organisation, and the interpretation of the facts can be used.	Limited focus on artefacts influence on organizational systems. The behaviour of the actors is important in relation to analysing the organisation, as the behaviour is not predetermined alone by rational artefacts and organisational goals, but also the social and subjective norms.	The artefacts related to the single activities are important, as e.g. contracts, procedures to some extent affect the formal corporation between actors. The behaviour of the individual is to a large extent determined by the subjective lifeworlds, and relates to the activities the individual participates in. Through the activities the others objectives and preferences also affect the behaviour.

Communication: The social construction of reality	Communication is rational, meaning that the communication lines are predetermined by power relations, organisational structures and procedures. This means that especially centralised meaning structures are important. Communication is based on information and feedback.	The organisational culture and subcultures are important for the communication process. The communication lines are not only related to fixed structures, but also informal structures. Collective meaning structures are dominant.	Organisations are a system of interdependent activities. The system is embedded in, constituted by and dependent on continuing exchanges with the environment, and cultures that go beyond the organisational context. This happens through communication processes. A high degree of intercultural communication and thereby different "social realities" are accepted. Diverse meaning structures.

Table 28 Combining the theory of organisational reality and organisational systems in order to inspire the content of the roles of environmental coordinators.

14.12.1 Developing the roles of environmental coordinators

When combining the three organisational approaches namely a rational approach, a natural / socio-cultural approach and an open approach Scott develops four perspectives based on the three approaches; a closed and an open system approach and a rational and a social approach.

This layered model is based on two main shifts in the historical development of organisational studies. The first shift was in the 1960s from a natural (closed) to an open system approach, where organisations no longer were analysed as isolated phenomenons. (Scott 2003). The other shift is from a rational to a social understanding of organisations. This shift happened twice both within the closed and the open system approach.

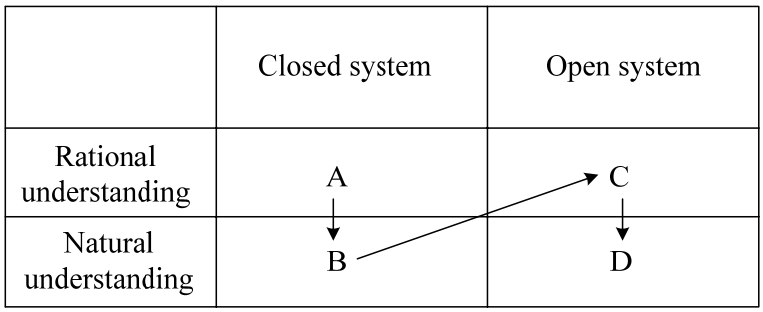

Figure 45 A layered model for combining different organisational approaches. The organisational approaches are inspired by Scott (2003).

Inspired by this approach four different roles of the environmental coordinator are developed as illustrated in figure 46. The terms applied in the figure are based on an environmental understanding of the general terms described by Scott.

Focus / View	Plant	Product chain
Technical	The technician	The LCA expert
Social	The facilitator	The networker

Figure 46 Roles of environmental coordinators related to different organisational approaches.

The organisational system approach at the power plants does not necessarily determine what kind of roles the environmental coordinators have, as this is related to the environmental coordinator's own interpretation of his roles more than the organisational system approach at the plants.

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Appendix IV: Communication theory

The Transmission Model of Communication

Within the transmission school, communication is considered to be messages that are transmitted as it is the case in a telephone line. The focus is how the sender and the receiver codes and decodes a message, and the transmission canal. Thereby effectiveness and accuracy are important concepts. Communication is a process, where the sender affects the behaviour or thoughts of the receiver. If the effects of the communication differ from the intended purpose of it, it is considered to be an error in the communication process. By examining the communication process the error can be identified. (Fiske, 1990)

Critics of the transmission model of communication argue that this approach is simplified, and that the picture of communication as a sequential process is simplified and incomplete. They argue that the transmission model considers the receiver as passive and that the receiver does not affect the construction of the meaning embedded in the message. Furthermore the non verbal signals between the receiver and the sender are not included. (Eisenberg and Goodall, 2001)

Shannon and Weaver's model is in John Fiske's words, '*widely accepted as one of the main seeds out of which Communication Studies has grown'* (Fiske 1982). Claude Shannon and Warren Weavers goal was to ensure the maximum efficiency of telephone cables and radio waves and they were engineers working for Bell Telephone Labs in the United States. Shannon and Weaver's work proved valuable for communication engineers in dealing with such issues as the capacity of various communication channels in 'bits per second'. However, Shannon and Weavers model are applied in a much wider application to human communication than a purely technical one.

The original model by Shannon and Weaver (Chandler, 1994):

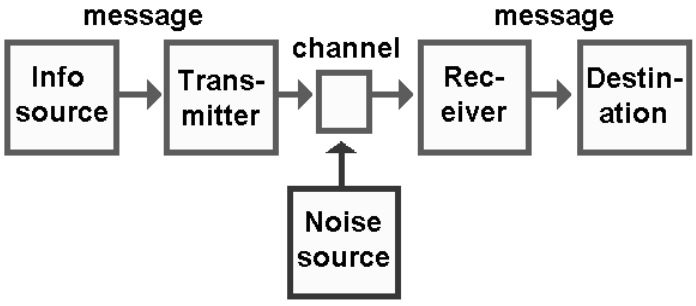

Figure 47 Shannon and Weavers linear communication model (Chandler, 1994)

The model consists of five parts:

- An *information source, the sender*, which produces a message.
- A *transmitter*, which encodes the message into signals
- A *channel*, to which signals are adapted for transmission
- A *receiver*, which 'decodes' (reconstructs) the message from the signal.
- A *destination*, where the message arrives. (Chandler, 1994)

The communication errors are introduced by a sixth part; noise. Noise interferes with the message travelling along the channel which can lead to differences between the signal received and the one that is sent. (Chandler, 1994)

The Semiotic Model of Communication

The semiotic school perceives communication as production and exchange of meaning. Contrary to the transmission school the focus is on how text interacts with individuals in order to create meaning, which is described as a specific culture. Misunderstandings are not perceived as mistakes in the communication process, they can occur because of cultural differences between sender and receiver as the receiver is an active interpretation of the message. In this school communication studies are based on texts (signs and codes) and cultural relationships. (Fiske, 1990)

The facts that signs and codes play an important role are described by Monö (1997). He describes the main concept “semiotic” as the study of signs and sign systems, their structure (syntax) and the study of their socio-cultural role. The semiotic school is amongst others represented by the American philosopher and logician C.S. Peirce and the Swiss linguist F. de Saussure. The latter distinguishes between the object described, the sign (that describes the object) and the interpreter. Whether the communication is successful or not depends on the interpretation of the signs. Signs are things that stand for something else, to someone. It can be understood as an isolated unit of meaning, and includes e.g. images, words, gestures, textures and sounds – basically all of the ways information can be communicated. Saussure emphasises the importance of signs. He splits signs into two parts; the physical presence (signifier) and its mental concept (signified). The interpretation of the receiver is called “signification”. (Fiske, 1998)

When communicating it is important that different receivers understand the message in the same way. The set of rules applied when interpreting signs are called codes. The term originates from Bernstein’s use of language codes that determines the development of children’s language. The meaning of a sign depends on the code within which it is to be found. Codes provide a framework within which signs make sense. As an example it is agreed upon what meaning is put into traffic signs, but this also goes for the meaning of facial expressions. (Fiske , 1998)

14.12.2 Jacobsen's communication model

Jacobsen's communication model is, according to Fiske (1999), a symbiosis between the transmission and the symbiotic school. The communication process is described as follows:

"*The sender sends a message to the receiver. To be operative, the message needs first of all a context (...) of which the receiver is aware, and which is both verbal and susceptible to verbalization. Next, the message needs a code which is shared, in whole or in part, by the sender and the receiver (...) Finally, contact is needed between the sender and receiver a physical channel and a psychological bond which enable them to establish and sustain communication*" (Jakobson, 1963, quotation from Fiske 1999)

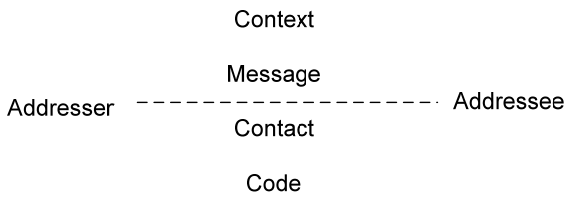

Figure 48 Jacobsens communication model (fiske, 1999).

For a message to become a part of the communication it requires that the sender (addresser) and the receiver (addressee) have a common foundation consisting of a common repertoire, in order for the receiver to decode the message. Therefore, the content of the message must be designed in order to fit the receiver. It is likely that communication can get off the track if the receiver and the sender have different backgrounds and points of reference (Different realities). (Fiske, 1999)

Whether a message is understood by the receiver depends both on the receivers interpretation of the message and the intentions of the sender. Therefore, it is important to know which code to use in relation to each specific receiver.

Both senders and receivers are active in the communication process and both influence the outcome or effect of the communication. The receiver is selective regarding where to put his attention, perception and retention. The latter is what is registered or remembered for later appliance. (Fiske 1990)

The communication is not solely a question of the content of the message and the reception, but is also a product of the social realities which are the context for the communication. By context Jacobsen only meant the signifier.

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Dansk resumé

Tidligere bestod virksomhedernes miljøkommunikation primært af informationer om lokale miljøpåvirkninger henvendt til naboer og lokale myndigheder. I dag er miljøkommunikation rettet mod internationale interessenter og omfatter både miljømæssige og sociale konsekvenser. Især store virksomheder har ændret, både hvad de kommunikerer, og hvem de kommunikerer til. Når mængden af interessenter forøges og deres interesser ligeså, bliver organisationerne nødt til at revurdere, hvordan de håndterer kommunikationen.

I innovationskonsortiet CEMIP (Center for Effektiv Miljøkommunikation I Produktkæder) er en række miljøkommunikationsværktøjer blevet udviklet og implementeret i de deltagende virksomheder (Elsam, Junkers, Vestas, Hartmann og Coloplast). Implementeringen af værktøjerne i organisationerne bød på udfordringer specielt i forhold til afdelinger, der havde andre traditioner og praksis end i de miljøafdelinger, hvor værktøjerne er udviklet.

I denne afhandling er det understreget, at det er vigtigt, men ikke tilstrækkeligt, at udvikle værktøjer til grønne indkøb. Udvikling af passende værktøjer bør suppleres med fokus på betingelserne for implementering af værktøjer i en organisatorisk sammenhæng. Hovedvægten i afhandlingen er at analysere implementeringen af grønne indkøb i Elsam; dermed afgrænses til at fokusere på de interne interessenter.

Afhandlingen er motiveret af følgende forskningsspørgsmål:

Hvordan præger og faciliterer organisatoriske subkulturer implementeringen af grønne indkøb?

Forskningsspørgsmålet besvares ved at adressere følgende underspørgsmål:

1) Hvordan undersøges organisatoriske subkulturer indenfor grønne indkøb?
2) Hvad er forskelle og ligheder imellem henholdsvis subkulturerne og praksis for grønne indkøb i Elsam?
3) Hvordan påvirker subkulturerne grønne indkøb i Elsam?
4) Hvordan kan miljøpraksis i Elsam forbedres med henblik på at facilitere implementeringen af grønne indkøb?

Den teoretiske ramme

Denne afhandling har en induktiv tilgang, hvor empirien er i fokus, mens teorien er designet og anvendes som en fortolkningsramme. Der er udviklet en teoretisk ramme til at analysere subkulturerne inden for grønne indkøb i Elsam. Den teoretiske ramme består af tre hovedområder: Individernes livsverden, subkulturerne i afdelinger og interaktionen mellem subkulturerne. Der tages et socialkonstruktivistisk udgangspunkt i analyserne af indkøberes og miljøkoordinatorers forståelse af grønne indkøb i Elsam.

Kulturbegrebet bruges til at analysere de sociale meningsstrukturer, mens livsverdenskonceptet retter sig mod de individuelle opfattelser. Aktørernes livsverden kommunikeres og bliver enten bekræftet eller anfægtet i subkulturerne. Gennem bekræftelsen dannes kollektive meningsstrukturer i subkulturerne, og det er disse strukturer, der udgør subkulturen.

Igennem arbejdet med at analysere Elsam-casen viste det sig, at den teoretiske ramme ikke egnede sig til at analysere interaktions- og oversættelsesprocesser mellem subkulturerne, når de empiriske data ikke består af to sammenlignelige situationsbilleder fra forskellige tidspunkter. Derfor introduceres interaktions- og oversættelsesprocesser med fokus på begreberne ”boundary objects” og ”brokers” (mæglere). Begreberne anvendes i forklaringen af den interaktion, som knyttes til fælles referencer, for at fremme et hensigtsmæssigt overlap i interaktionen mellem subkulturerne i Elsam.

Case studiet

Det kvalitative case-studie analyserer, hvordan en række indkøbere og miljøkoordinatorer opfatter grønne indkøb i Elsam. 14 indkøbere og 10 miljøkoordinatorer, der er distribueret i hele organisationen, blev interviewet. Empirien er suppleret med ophold i den centrale miljøafdeling og på et kraftværk.

Tre kraftværker er analyseret. De blev udvalgt med det sigte, at de skulle være så forskellige som muligt. I denne udvælgelse er især fokuseret på deres niveau af medarbejderdeltagelse i miljøarbejdet og deres vægtning på eksternt miljø versus arbejdsmiljø. Udover kraftværkerne er den centrale miljøafdeling, den centrale indkøbsafdeling og projektafdelingen også analyseret.

Politikker og procedurer for grønne indkøb i Elsam retter sig mod alle afdelinger, men afdelingernes anvendelse af dem er forskellig. Miljøpolitikken ses primært som et strategisk prioriteringsværktøj, der anvendes af den centrale miljøafdeling, hvorimod kraftværkerne ikke finder den relevant. Dermed bliver subkulturerne på kraftværkerne betydende for praksis i miljøarbejdet.

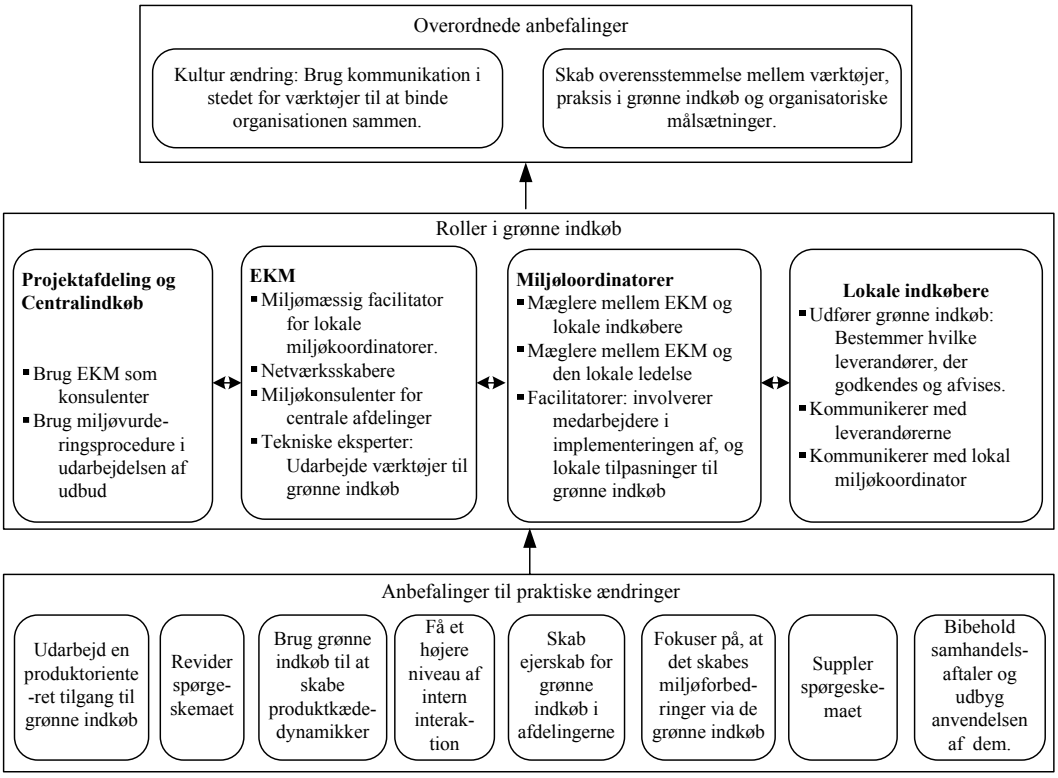
Den centrale miljøafdeling i Elsam har sammen med repræsentanter fra afdelingerne udarbejdet en grøn indkøbsprocedure. Det er intentionen, at proceduren skal implementeres i alle afdelinger i Elsam, men det er primært på kraftværkerne, den er fundet anvendelig. I projektafdelingen, den centrale indkøbsafdeling og den centrale miljøafdeling er der udviklet alternativer til proceduren. Dermed er der både forskellige værktøjer og praksis i de grønne indkøb i Elsams afdelinger, og målet om at udvikle en fælles procedure er ikke opnået.

Der afvises kun få leverandører som følge af kravene i de grønne indkøb, og interaktionen mellem leverandører og indkøbere er primært baseret på informationsudveksling. Indkøberne finder det ikke motiverende at udføre miljøvurderingerne, da deres indsats ikke fører til faktiske ændringer i den måde, leverandørerne udvælges, og heller ikke medfører, at leverandørerne ændrer deres praksis. Dermed skabes en selvforstærkende effekt; kravene til leverandørerne har ingen effekt, hvilket er demotiverende for indkøberne, der så ikke gør noget for at forbedre deres praksis på området.

Afdelingernes kommunikationspraksis er forskellige. En gruppe bestående af indkøbere fra kraftværkerne og en gruppe bestående af miljø- og sikkerhedskoordinatorer i Elsam er de to fora, der har størst betydning for kommunikationen relateret til grønne indkøb. I disse grupper kommunikerer medarbejderne med deres kolleger fra andre dele af Elsam. Interaktionen mellem de centrale og lokale afdelinger er begrænset og baseres primært på informationsudveksling frem for dialog eller samarbejde. Niveauet af interaktion internt i Elsam er betydende for de lokale afdelingers adgang til teknisk miljøviden og dermed mulighederne for at opsætte relevante miljømæssige krav til leverandørerne, der sandsynliggør, at kravene faktisk fører til ændringer i udvælgelsen af leverandørerne. Opbakning til indkøberne fra den lokale ledelse og de lokale miljøkoordinatorer varierer meget fra kraftværk til kraftværk, og nogle indkøbere føler ligefrem, at de bliver modarbejdet, hvilket er en barriere for implementeringen af grønne indkøb.

Anbefalinger

De udfordringer, der blev identificeret i caseanalysen, danner grundlag for en række anbefalinger til Elsams fremtidige arbejde med grønne indkøb. De er præsenteret i figur 49.



Figur 49 Anbefalinger til ændringer af grønne indkøb i Elsam.

Udfordringerne i arbejdet med grønne indkøb er baseret på den eksisterende praksis i organisationen. Analysen viser, at der er brug for mere fleksibelt værktøj til grønne indkøb og fleksibilitet i måden, hvorpå værktøjerne implementeres. Dette gør sig specielt gældende for spørgeskemaet til leverandørerne og den grønne indkøbsprocedure.

I udviklingen af spørgeskemaet blev der fokuseret på at skabe konsensus mellem de forskellige interne interesser ud fra et rationale om, at spørgeskemaet skulle implementeres i alle afdelinger. Resultatet, nemlig et meget ufleksibelt spørgeskema, har i praksis skabt barrierer i implementeringsprocessen. Nederst i figur 49 er præsenteret de specifikke anbefalinger til at ændre de nuværende grønne indkøbspraksis.

Anbefalingerne til ændringer i praksis og værktøjer skaber fundament for anbefalinger om at udvikle rollerne i miljøarbejdet i organisationen, og disse er præsenteret midt i figuren. Et eksempel på en sådan rolleændring: For at sikre overensstemmelse mellem initiativerne i EKM, indkøberne og den lokale ledelse, skal de lokale miljøkoordinatorer på kraftværkerne fungere som mæglere mellem de andre. For at det kan lade sig gøre, skal de have tilstrækkelig legitimitet til at kunne influere på udviklingen af grønne indkøbspraksis og kunne mægle, når der er modstridende interesser mellem fx den lokale ledelse og indkøberne.

At ændre og udbygge rollerne i miljøarbejdet og forbedre de eksisterende praksis er to skridt på vejen mod de ønskede resultater. Det fører til følgende overordnede anbefalinger, der også er illustreret øverst i figur 49.

1. *Ændre kulturen, så der fokuseres på kommunikation i stedet for værktøjer til at binde organisationen sammen*. Dette betyder blandt andet, at EKM skal have en mere kommunikerende rolle, og at deres placering i et eksternt datterselskab skal genovervejes, da det modarbejder kommunikationen.

2. Skabe overensstemmelse mellem værktøjer, praksis og virksomhedens mål. For at skabe overensstemmelse mellem virksomhedens mål og praksis anbefales en netværksorganisering, hvor de tekniske miljøkompetencer er distribueret i organisationen. Dette kan suppleres med en bottom-up tilgang, hvor ansvaret for tilpasning og implementeringen af værktøjerne til grønne indkøb primært er placeret hos de lokale miljøkoordinatorer og indkøbere.

Miljøinitiativerne i Elsam har udviklet sig fra at fokusere på produktionen til at adressere produkterne set i et livscyklusperspektiv. Dette skaber udfordringer, eftersom nye roller skal fyldes ud og nye kompetencer være til stede i organisationen. Andre miljømæssigt proaktive virksomheder står overfor de samme udfordringer, eftersom deres miljøarbejde udvikler sig på en lignende måde.

Klimadebatten, produktorienteret regulering og et stigende fokus på CSR fordrer alle produktkædesamarbejde. Nogle virksomheder ser dette som et potentiale for at skabe et tættere samarbejde med deres leverandører, og anvende leverandørernes kompetencer ikke kun til at få produkter men også til at få adgang til viden og teknologi relateret til produkterne.

Resultaterne af denne afhandling viser, at for at virksomhederne kan imødekomme denne udfordring, er det ikke tilstrækkeligt, at der udvikles en miljømæssig værktøjskasse til at håndtere det; der er brug for miljøkommunikation, der kan støtte både de interne og eksterne relationer og vidensudveksling. Miljøkommunikationen er nødvendig for at kunne vælge de rigtige værktøjer, implementere dem i den konkrete kontekst og dermed skabe værdi af de resultater, som værktøjerne har. Vel at mærke en værdi, der rækker ud over symbolværdien i anvendelsen af værktøjerne.