

Master thesis

**The Port of Aalborg: Catching the Wave of Sustainable
Development through employee engagement and
organizational change**



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Title page

Title: **The Port of Aalborg: Catching the wave of sustainable development through employee engagement and organizational change**

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Abstract

Shipping and ports are major economic, industrial and logistics centers and essential components of the global trade. At the same time, they also contribute extensively to pollution of environment and affect human health. In recent years, port companies along with shipping associations, research institutes, governments and environmental agencies have been initiating and carrying out strategies and programs that address issues related to more environmentally friendly and sustainable port performance.

The Port of Aalborg (PoA) is multifunctional port offering wide range of activities such as cruising, transportation of bulk equipment and liquid cargo, loading and off-loading of goods, lease of land and warehouses, and many others. PoA seeks to become “Denmark’s most intelligent port” by providing a good service through smart logistics and robust cooperation. Good service implies “good employees” who have relevant knowledge, skills and motivation of doing “good job”. Management of PoA considers employees engagement as a key feature of a strong and committed organization and as a link to sustainability. Therefore, PoA became a subject of interest of the present master project and was chosen as a central case study.

This thesis was initiated to uncover the importance of employee participation in achieving continuous improvements and sustainability. Employee attitude to change and readiness to participate in environmental initiatives were assessed with a help of survey. It helped to identify what would motivate and encourage employees to be part of sustainability-oriented program. Moreover, existing environmental management system, organizational structure, strategy and culture of PoA were thoughtfully parsed.

Finally, grounded recommendations and suggestions in the end of this research were elaborated with a help of theoretical review and based on survey results and company’s analysis. Moreover, the main goal of the research was achieved by creating a toolbox. Toolbox provides guidelines for management of PoA how to introduce and support employee participation in sustainable development activities and how to change corporate strategy toward sustainability-oriented. Toolbox suggests that employee involvement can manage organizational change at Port of Aalborg and help to achieve its competitive advantage.

Keywords: *environmental management system, organizational change, innovation, dynamic capability, proactive strategy, employee participation, sustainable development.*

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Table of contents

ABSTRACT	3
ACKNOWLEDGEMENTS	5
TABLE OF CONTENT	7
LIST OF FIGURES AND TABLES	9
1. INTRODUCTION	10
1.1. The challenge	11
1.2. Aim of the project and research question	11
1.3. Structure of the thesis	12
2. RESEARCH METHODOLOGY	
2.1. Research approach and methods	14
2.1.1. <i>Case study method</i>	14
2.1.2. <i>Data collection</i>	15
2.1.3. <i>Interviews and interpretation</i>	15
2.1.4. <i>Survey</i>	16
2.2. Reliability, validity and delimitations of the study	16
2.3. Research design	16
3. THEORETICAL BACKGROUND	
3.1. Organizational capability to learn and organizational change	18
3.2. Internal attributives predetermining environmental posture of organization	19
3.3. Achieving sustainability	20
3.4. Environmental management system as innovative process	21
3.5. Employee participation as a long-term sustainability initiative	23
4. RESULTS AND DATA ANALYSIS	
4.1. Port of Aalborg profile: services, logistics, business	25
4.2. EMS of Port of Aalborg	28
4.3. Current practices at Port of Aalborg and future trends	28
4.3.1. <i>Dredging</i>	28
4.3.2. <i>“Green accounting” service</i>	28
4.3.3. <i>Electricity consumption</i>	29
4.3.4. <i>Waste minimization</i>	29
4.3.5. <i>Employee participation initiative</i>	30
4.3.6. <i>Collaboration with stakeholders and networking</i>	30
4.4. Sustainability vision by Port of Aalborg	30
4.5. Survey analysis: environmental attitude and training interests of employees of PoA	31

5. DISCUSSION AND RECOMMENDATIONS	
5.1. Current strategy type of Port of Aalborg	33
5.2. Organizational structure, culture and climate at PoA	34
5.3. Toolbox for PoA: successfully engaging employees and moving toward sustainability	34
5.3.1. <i>Employee engagement</i>	34
5.3.2. <i>Becoming hyperactive — achieving sustainable development</i>	35
6. CONCLUSION	37
REFERENCES	39
APPENDICES	
APPENDIX 1: Theoretical concepts	
APPENDIX 2: Maps and images of Port of Aalborg	
APPENDIX 3: PoA's EMS certificate, environmental policy and objectives	
APPENDIX 4: Survey results diagrams	
APPENDIX 5: Survey	
APPENDIX 6: Organizational structure of PoA	

List of tables and figures

TABLES

Table 2.1: Application of theoretical framework and methods for research sub-questions and working questions	17
Table 5.1: Strategies types by Ford, Roome and Hart	33

FIGURES

Figure 1.1: Direction of the process of change for Port of Aalborg	11
Figure 3.1: Vision, knowledge and organizational innovation	19
Figure 3.2: Benefits of employee participation	24
Figure 4.1: Throughput of goods in Port of Aalborg in 2007-2011	27
Figure 4.2: Financial profile of PoA: turnover and earnings	27

1. Introduction

“Motivation is everything. You can do the work of two people, but you can’t be two people. Instead, you have to inspire the next guy down the line and get him to inspire his people”

Lido Anthony Iacocca

It is hard to imagine nowadays an organization that achieved its success and profitability without addressing environmental and social issues. Any world leading business company either retailer and clothing companies (e.g. Walmart, Patagonia) or energy and petrochemical companies (e.g. Shell) show an example of high commitment to sustainability. Even transport industries, which are hard to imagine being sustainable, have started to look for pollution minimization strategies and address social issues. Doubtless, maritime industry vastly affects all spheres of human activity. Global seaports are critical link to global marketplace; dynamic centers of trade and essential element of the worldwide logistics chain. They provide big quantities of jobs and play an immense role in local and national economies.

Well known that the vast amount of goods (furniture, cars, foods, etc.) is delivered to any part of the world by ships. According to Breitling (2010), the international shipping and port industry is responsible for the carriage and handling of approximately 90% of world trade. In 2009, world seaborne trade exceeded 8 billion tons compared to 4 billion tons in 1990, 3.7 billion in 1980 and 2.6 billion in 1970. It is expected to double or triple in some areas by 2020. Throughout Europe, ports are experiencing rapid growth in traffic, on average 4% per year and for container traffic between 7-15% per year (ESPO, 2005). Consequently, port companies and authorities always seek opportunities to enlarge already significant area of coastal land occupied by port complexes and associated infrastructure (roads, rail links, telecommunications, power grids, etc.) (MWG, 2006-7). Apart from the potential conflict with the interests of local residents and communities, businesses and stakeholders, port development often implies raise of environmental burden by releasing emissions to air, water and soil and affecting negatively coastal eco-systems and biodiversity.

Considering the aforementioned, besides economic realm, ports are of high importance from an environmental and societal perspective. Therefore, to make a company profitable and competitive, port has to create a strategy simultaneously addressing three spheres: environment, business and society. Such strategy requires understanding of sustainability concept and key steps of achieving it. Introduction of environmental management system (EMS) is often seen as a crucial moment to catch the first wave toward sustainability. EMS can help ports track and fulfil legal environmental duties as well as identify opportunities for improvements. Moreover, ports that implement an EMS can save costs due to increased efficiency, lower insurance fee, avoided regulatory penalties; experience water and energy savings, and reduce waste disposal costs. Robust and accountable environmental program can attract business and community goodwill (I2S2, 2010). According to ICCWBO (2012), every company has “to recognize environmental management as among the highest corporate priorities and as a key determinant to sustainable development; to establish policies, programs and practices for conducting operations in an environmentally sound manner”.

1.1. The challenge

The company “Port of Aalborg” (PoA) did not become an exception: as a rapidly growing enterprise the port has developed its own environmental management policy which is certified by Det Norske Veritas (DNV) in 2010 according to ISO 14001: Environmental Management Systems – Specification with guidance for use. PoA is a multifunctional organization; it represents both commercial port and a transport centre. Among services it provides are handling of all types of transport, cargo loading/unloading; consultancy, project management, supervision, assistance and documentation. In addition, company is renting warehouses, facilities for offices and leases a land (AalborgHavn, 2012a).

According to AalborgHavn (2012a), PoA is on its way of becoming “Denmark’s intelligent port”. Herewith indicates management’s high concern for the environment along with the continuous, paying business, development that can bring benefit for the port’s customers and tenants. According to requirements of ISO 14001, a firm pledges to comply with relevant environmental legislation and to commit to continual improvement and pollution prevention.

Nonetheless, getting EMS certified is just a beginning of the journey. As a completely new process, implemented by PoA, this project treats EMS as innovation. Thus, organization faces considerable changes in order to make a process workable and beneficial. To do so PoA has to be able to develop proper knowledge regarding new system and continuously acquire new knowledge through learning and communication.

Importantly that organization is not just a physical facility, but rather people who work there and form its culture. Indeed, employees are those by whom any process or activity is performed. In this regard, they are crucial actors in making a change inside the organization. Moreover, to manage that change and turn it into more profitable and sustainable strategy, good communication and employees engagement programs are essential.

Therefore, the present project is focused on analysis of how effective employee participation can be in regard of managing change and what is needed to motivate and encourage staff participation. Moreover, the report addresses close link between sustainability and organizational learning.

1.2. Aim of the project and research question

The overall aim of this thesis is to make an analysis how Port of Aalborg undergoes changes moving toward sustainability. Grounded with relevant theoretical framework, the research shows how through concept of “organizational learning” and “employee involvement” PoA can achieve significant improvements. In addition, the research provides suggestion that PoA, as an example of port-pioneer, will foster dialogue and collaboration among key stakeholders involved in port’s activities in order to share/exchange knowledge and information and facilitate mutual learning. These suggestions are compiled into toolbox that will serve as a guideline for managers of PoA desiring successfully engage personnel and achieve sustainability. Figure 1.1 shows the concept where employee involvement is central focus of this study and appear to be a binding link between current position of PoA and move toward sustainable development.

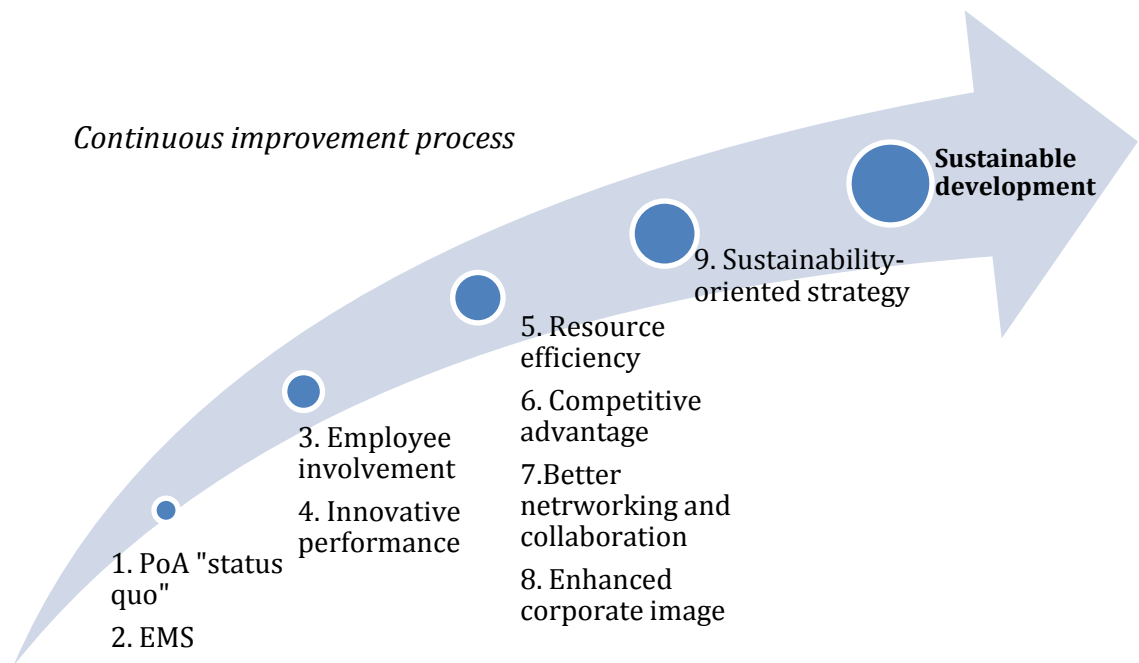


Figure 1.1: Direction of the process of change for Port of Aalborg (own creation)

In order to accomplish the goal of the study, research question is proposed as following

How can employee engagement guide organizational change toward sustainable development?

Sub-questions were developed to answer main research question and to gradually show how theoretical background can be used to support an answer:

1. What are the benefits of employee participation?
2. What actions is Port of Aalborg taking to address sustainability issues?
3. What is Port of Aalborg's organizational strategy and values?
4. What are the current knowledge and level of readiness to change of employee of PoA?
5. How can stakeholders be engaged into sustainable development process driven by Port of Aalborg?

1.3. Structure of the thesis

This thesis is structured into the following chapters:

1. Introduction: contains research problem analysis and justification of case study choice. Also provides reader with aim of the study, research question, sub-questions and structure of the thesis.

2. Methodology: provides explanation and justification of the particular approach and methods applied throughout research as well as description of data collection methods.

3. Theoretical background: gives an overview of relevant literature and sources that were used in this study for explanation of key concepts and definitions as well as for supporting current problem within the research field. Critical literature analysis is done with the regard

to concepts of sustainable development, EMS, organizational change, learning, employee involvement, environmental strategy and innovation.

4. Results and data analysis: introduces case study in depth; gives an analysis of research findings from survey, interviews and observations; aims to synthesize these findings with theoretical framework.

5. Discussion and recommendations: contains discussion about current type of strategy of PoA and toolbox with recommendations for managers of PoA upon introduction of employee participation programs and moving toward sustainability-oriented strategy.

6. Conclusion: provides an evaluation and summary of main findings, explains how research question was answered and gives suggestions for further studies.

Reference list can be found at the end of the report. Citations and reference list are compiled using Harvard method. Appendices follow the reference list. They include additional graphs, tables, images, data and survey's transcripts.

2. Research methodology

This chapter presents methods and approach used in this project, describes means of data collection and tools which were employed to answer the research question and sub questions. Chapter also contains an introduction to a case study approach, outline of research design and limitations of the study.

2.1. Research approach and methods

There is mix of methods employed in this study. There are both quantitative and qualitative research elements as well as mix of deductive and inductive approaches.

Report can be divided into two sections where different research strategies were deployed. First section includes introduction, methodology and theoretical background chapters. It is descriptive part of the project, where definitions of terms used in study, such as EMS, organizational change, and sustainability are provided. Descriptive research helped to educe a problem, research questions and methods which are to be employed in data gathering and ideas generating. Therefore, deductive method is used in this part of the research. Deduction helped to move from more general theory related to environmental change to the more specific case applicable to case of Port of Aalborg.

Second section includes chapter with results with case study description and analysis, discussion and conclusion. This part is a mix of descriptive and qualitative approach. Descriptive approach allows performing a holistic investigation of the case by analyzing variety of variables over time using information from wide range of sources (Merriam, 1988).

According to Bryman et al. (2008), qualitative approach is “epistemological and ontological perceptions of the „real” world”, which might be normally used for examination of human behaviors in social, cultural, and political context in which it occurs (Strauss and Corbin, 1998). Such examination is done via case study approach, which is typical qualitative method and used to complete an in-depth study of one type of phenomenon (Yin, 1994).

Niglas (2010) narrowed down typical features of qualitative study that are following: subjective, inductive, and phenomenological approach, participant observation and understanding. Indeed, phenomenological approach is widely used in organizational management research, which is based on examination of the factors and motives of individual change and knowledge transformation (Hackley, 2003). An observation of specific case leads to discovery of new concepts and relationships emerging new hypothesis from data collected by several means. These are also the features of an inductive approach. Herewith, deduction and induction were both utilized throughout the study.

2.1.1. Case study method

Port of Aalborg is chosen as a single case study in this research. Eisenhard (1989) and Merriam (1988) argue that one case study approach gives possibility of deeper and detailed investigation of organization, group of people or individuals. This approach is very particularistic and specific, which was an ideal approach to be used in this research for analysis of PoA’s organizational culture, and to see what drives PoA to become innovative and learning and what motivates employees to be involved into that process. Whilst this kind of

methodological approach is suited for explorations, many authors argue that it does not allow for extensive generalization of findings, however, Flyvbjerg (2006) argues opposite. In addition, Frances and Vredenburg (1996) stress that one case study does allow for the grounding of theoretical concepts.

That is why case study is chosen as research method that allowsto verify, illustrate and construct theory (Grunbaum, 2007). In present project the theory construction process is based not only on the literature, but also on the consideration of empirical observations and reality experiences, meaning that induction method was employed. Case study method helps to analyze “what” and “how” questions in organizational context (Carroll and Swatman, 2000).

2.1.2. Data collection

In order to collect sufficient information and analyze current strategy and culture at PoA, the relationship between its environmental management system and employee involvement, readiness of employees to engage and to change, diverse theoretical and empirical methods of data acquisition were chosen. Use of different methods allows more insightful understanding of the discussion and phenomena, according to Johnson and Christensen (2004), it helps to achieve more comprehensive findings and increase confidence in results, while Yin (1994) states that “multiple sources of evidence is the way to ensure construct validity”.

Secondary data was gathered via literature. These implied broad theoretical review of literature regarding EMS, organizational change, organizational strategy, its link to sustainability concept and so forth. The literature review provides a guideline to this study.

Regarding collection of primary data, there are both qualitative and quantitative research elements were employed. Many studies (Greene et al., 1989; Bryman, 2006; Creswell and Plano Clark, 2007) have proven that combination of quantitative and qualitative elements may provide a better understanding of research problems than any approach alone, and help to collect more valuable data that were not even anticipated. Moreover, Aguinis et al. (2010) call to use mixed approach notably regarding management and organizational sphere.

First, qualitative data were obtained during personal communication (interviews) with coordinator of environmental management at PoA. Second, valuable data were collected from the survey which was forwarded to all employees of PoA. Third, on-site observations helped to finalize the overall picture of case study.

2.1.3. Interviews and interpretation

Interviews are one of the most important sources of evidence (Stewart & Cash, 2003). In this case interviews helped to gather valid and reliable data from the “first person”. Namely, interview was performed on April 4th 2012 with Brian Rasmussen. Brian Rasmussen is a leader of environment section which was established under technical department in division of infrastructure. Also he is a leader of team which is responsible for establishing employee training program. Being practically involved into environmental management issues, Brian brought valuable insight into researcher’s ideas about this research.

Interview was semi-structured, meaning that a dialogue between interviewer and interviewee was fairly informal, conversational, with no strict agenda. Interview went first from a “free story-telling” by interviewee, during which interviewer had possibilities to “catch a flow” and ask questions prepared beforehand. In semi-structured interview, according to

Hackley (2007), "... the fewer questions the researcher asks the better the quality of data". Another advantage of semi-structured interview is that it unfolds its potential for spontaneity and triggers both researcher and interviewee to probe deeper into the given situation and maintain two way communications (Patton, 2002; Kajornboon, 2004).

2.1.4. Survey

Survey is a source of quantitative data collection. It helped to collect valuable and trustworthy data set. The purpose of the survey is to assess the knowledge of employees of PoA regarding PoA's work with environment and sustainability; to analyze employees' attitude and readiness for change, to reveal interest and barriers to employee engagement.

A survey is based on literature review and made using "Google Documents" application. It is on-line survey, first sent to a leader Brian Rasmussen for revision and later forwarded to all employees. Survey has 15 diverse questions (Appendix 5) ranging from closed and multiple choice questions to open and ranking type of questions.

2.2. Reliability, validity and delimitations of the study

Bryman (2006) argues that use of mix of quantitative and qualitative elements of data collection enhances the integrity of findings; hence, the credibility and validity of data in this study can be justified in that sense. In addition, the research results can be considered reliable with regard of use the critical case study analysis, meaning that every procedure (whether interview or relevant documents obtained directly from PoA) and records were documented. The limitations of this project involve practical and theoretical issues as well as with respect to the research design and methodology. While analyzing the effect of employee involvement on improvement of environmental performance, project does not include any suggestions or estimation relatively financial side of those aspects, i.e. it is advisable before implementation of any strategy to conduct cost-benefit analysis. Another limitation that may have affected findings is survey data. Even though survey was anonymous, there could have been answers affected by social or professional biases of respondents (Sharma, 2000). Also, limitation of survey is the quantity of respondents that completed survey. The overall quantity of respondents equals to around 1/3 of all employees of PoA.

2.3. Research design

Table 2.1 gives an outline of research design, namely, how research questions were answered with a help of relevant literature sources and application of research methods.

Research sub-questions	Working questions	Research methods	Source of information	Where question is answered
1.What are the benefits of employee participation?	What is EMS and its characteristics? What role employees play in EMS? What is the link to sustainability?	Literature review: sustainability; EMS, organizational change, learning, innovation, employee participation	ISO 14001; Daily and Huang; Damanpour and Evan; Agyris and Schon; Eisenhardt and Martin; Teece et al.; Russo.	Chapter 3, section 3.4; 3.5
2.What actions is Aalborg Port taking to address sustainability issues?	What PoA does to minimize its environmental load? How are business and social issues dealt?	Documents and publications review; Interview	Main web-page of PoA; Relevant documentation from PoA; Interview with Brian Rasmussen	Chapter 4, section 4.2; 4.3 (4.3.1-4.3.5); 4.4.
3.How can stakeholders be engaged into process driven by PoA toward sustainability?	What are the main stakeholders for PoA? What is the effect of organizational change at PoA on its stakeholders?	Literature review; Documents Interview	Stakeholder literature: Windsor, 2004; Roome and Wijen, 2006; PoA's reports Interview	Chapter 4, section 4.3.6 Chapter 5.3.2
4. What is the current knowledge and readiness of employee of PoA to change?	What do employees know regarding EMS? What would motivate them to be engaged?	Survey; Interview; On-site observations	On-line survey completed by personnel of PoA Own knowledge	Chapter 4, section 4.5
5. What is Port of Aalborg's organizational strategy and values?	What strategy type PoA has? What are the culture and values of PoA?	Documents and publications review; Interviews Literature on strategy	Main web-page of PoA; Relevant documents from PoA; Sources: Hart, Roome, Ford	Chapter 5, section 5.1

Table 2.1: Application of theoretical framework and methods for research sub-questions and working questions

3. Theoretical background

This chapter gives an overview of the theoretical framework used throughout the research. Literature analysis was performed in regard with key definitions and concepts that are important to support research hypothesis and to analyze study phenomena. The vast amount of revised literature related to EMS, innovations, organizational learning and change, employee engagement and sustainability, revealed the close link between each of the concepts.

First, it is explained how organizational change happens and how it depends on capability of organization to learn. Second, the interpretation of factors predetermining organizational learning capability and sustainability posture of organization is given. Later follows a brief explanation of sustainability term and how adoption of EMS can be an integral step toward sustainability. Third, EMS concept is considered to be an innovative process that requires employee participation for successful EMS implementation and guarantee of continual improvements.

3.1. Organizational capability to learn and organizational change

Any change introduced into process or service involves organizational learning. Anand et al. (2009) define the ability to make changes to routine operating processes through organizational learning as a *dynamic capability*. Indeed, many researches (Teece et al., 1997; Eisenhardt and Martin, 2000; Russo, 2009) show how the dynamic capabilities approach is applied to environmental management. With simple words, creation and implementation of environmental management skills is an example of the development of a dynamic capability of a firm (Teece et al., 1997; Anand et al., 2009). Moreover, dynamic capability offers the potential to identify where the improvement can be made, therefore, implies continuous improvement (figure 1, Appendix 1) (Ittner and Larcker, 1997; Anand et al., 2009). According to Barney (1991) and Aragon-Correa and Sharma (2003), the capabilities are complex and path dependent, meaning that they are formed during the process, from technologies, out of organizational culture and people (Russo and Fouts, 1997; Sharma, 2000). Dynamic capabilities allow a firm to generate new, value-creating strategy (Eisenhardt & Martin, 2000). Despite numerous definitions of dynamic capabilities (Teece et al., 1997; Eisenhardt and Martin, 2000; Russo, 2009), the model of it is still not defined. However, given the attributes of ISO 14001, in this study dynamic capabilities are outlined using figure 2, Appendix 1.

According to Argyris (1977, 1990), organizational change in response to environmental change is known as *organizational learning*, while Senge (1990) defines it as “a fundamental shift or movement of mind, enabling the environment to be perceived differently and to realize that the organization’s actions create problems and solutions”. Marquardt and Reynolds (1994) and Hames (1994) define organizational learning as a process of gaining new knowledge, skills, attitudes and values by which individuals change their behavior and actions. Learning is an indispensable element of innovative process and requires ability for individuals or systems to acquire new knowledge by mean of training and interaction (Cooke et al., 1997; Kloot, 1997). Learning is linked to an institutional structure with certain visions, support and initiatives (figure 3.1).

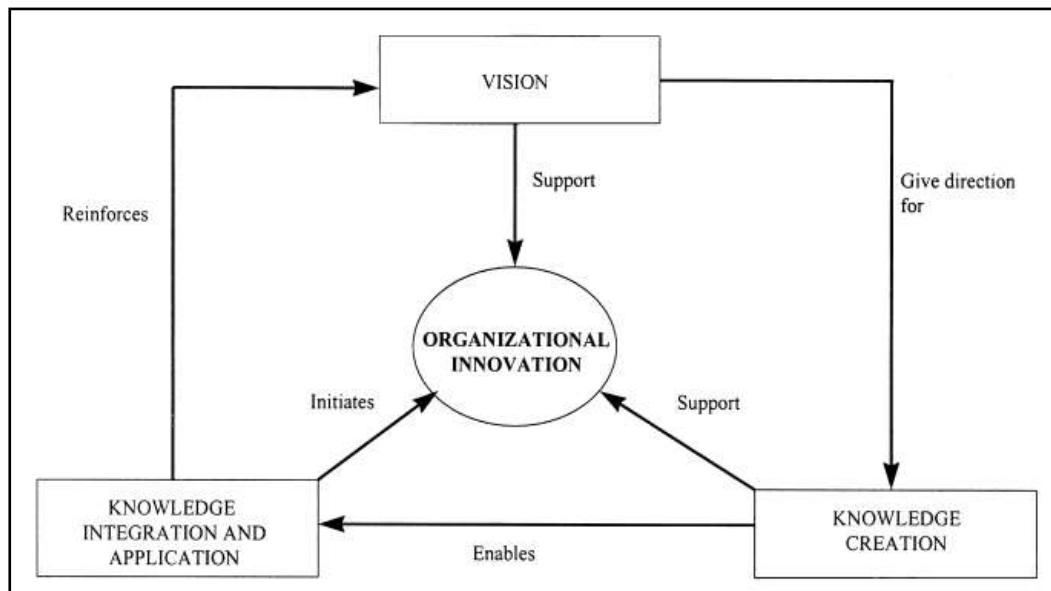


Figure 3.1: Vision, knowledge and organizational innovation (adapted from Johannessen et al.,1999)

Organizations are not just physical facilities, but rather people who work there and who create organization's unique climate and culture. Any change in process, communication or structure has to be supported and accepted by staff and associated with changing the behavior and attitude (Schneider et al., 1996).

Given this concept, capacity of an organization to learn and to form knowledge often, but not always (Fiol and Lyles, 1985) predetermines organizational change. However, organizational learning itself is a process of detecting and correcting errors (Argyris, 1977), thus it is a process of transition and change.

According to Fiol and Lyles (1985), Clarke and Roome (1999), Shadur et al. (1999), there are always internal attributives that predetermine learning capacity of organization and direction in which that learning occurs, namely, organizational strategy, culture and climate.

3.2. Internal attributives predetermining environmental posture of organization

One of the key attributives that predetermine learning capability is organizational strategy. It affects learning by providing flexibility for decision-making and framework for interpretation of the environmental change (Fiol and Lyles, 1985; Cyert and March, 1963, Daft and Weick, 1984).

Environmental strategy is the strategic approach which is used by organization in order to address environmental issues that interface with firm's business (Aragon-Correa and Sharma, 2003). This approach may be carried in order to comply with legislation as well as to go beyond it by using innovative actions (Sharma, 2000). There are various types of environmental strategies proposed by many authors. For example, well known typology of organizational response to environmental impact is developed by Ford. He proposes four stages of strategy from inactive where the firm ignores environmental issues to the hyperactive strategy, the highest stage, where environmental issues become core value for a firm (Ford, 1992). Hunt and Auster (1990), Schot (1992), Roome (1992), Newman (1993) and

Hart (1995) have also formulated different types of corporate strategy. However, Roome's and Hart's typologies differ from others in a way that they have shown the interconnections among stages of strategies they proposed. This interconnection is a result of path dependencies of the organization development and embeddedness (of physical assets, employee skills and competencies, and organizational processes).

Besides environmental strategy, organizational structure and culture play essential role in a process of employee engagement and affect firm's performance (Holliday et al., 2002; Daily and Govindarajulu, 2004). Corporate culture and values have to permeate into activities and be adopted by all employees (Fiol and Lyles, 1985; Roome, 1992; McCloskey and Maddock, 1994; Madsen and Ulhùì, 2001).

The most known approach in organizational structure is top-down, however, another – horizontal - approach is also practiced. It is argued that horizontal, organic, approach tends to allow shifts and changes of beliefs and actions, therefore, more suitable for better communication (Beer et al., 1990; Daily and Huang, 2001; Daily and Govindarajulu, 2004). However, it is fairly rare that organization introduces purely “horizontal” structure. The best solution is to combine top-down approach with “horizontal (Lavery and Pennell, no date; Shadur et al., 1999; Doppelt, 2003).

Culture is defined by beliefs and values of organization's members (Burke and Litwin, 1992), herewith to support any process or activity and, what is more essential, to make it successful, cultural change is necessary (Kitazawa and Sarkis, 2000). Top management is committed to create a strong and supportive culture (Shadur et al., 1999; Daily and Huang, 2001). Denison and Mishra (1995) and Ramadan (2010) point out that participation and training of employees create a greater organizational commitment and, therefore, improve business effectiveness and lead to competitive advantage (Awal et al., 2006; Ramadan, 2010).

Culture and climate are interconnected, but not the same. Culture is background of organizational employees' perceptions (values and beliefs) whereas climate is more foregrounds of employees' perceptions (interpretations of organizational policies, practices, and procedures) (Schneider et al., 1996). Climate is affected by culture, however, employees' perception defines both, but at different levels (Burke and Litwin, 1992). Encouraging organizational climate positively affect employee participation in decision making, foster teamwork, and communication (Epstein and Roy, 1997; Shadur et al., 1999).

Also these internal attributives play essential role in determination of sustainable posture of organization. Organizational capability to acquire knowledge and skills and to modify them depending on external change influences organizational strategy and shows the stage a company is on toward sustainable development.

3.3. Achieving sustainability

It is not anymore surprising or unusual to see and hear how much the term “sustainability” is used nowadays. Indeed, this concept is already embedded in our daily life. Someone might say that this is just “theoretical concept” that does not work in practice. However, majority realize that it is a necessity for all humankind to strive for sustainability and ensure our decent future. People opt for sustainable life-styles, companies struggle to incorporate sustainable strategy and governments aim for sustainable states.

Besides conventional definition of sustainability, there is definition of sustainability for business and is following “... adopting business strategies and activities that meet the needs of the enterprise and its stakeholders today, while protecting, sustaining and enhancing the human and natural resources that will be needed in the future” (WBCSD, 2011).

Many authors (Pojasek, 2007; Bertels et al., 2010) recognize that sustainability framework has to be supported by integrated management system. One of those, EMS, plays crucial role for a company seeking not only for financial benefits, but also for being environmentally conscious and socially committed.

However, there are no prescribed rules on how to integrate sustainability into company. And the reason lies in many factors among which are corporate culture, institutional structure, current organizational performance and stakeholder relations (Labuschagne and Brent, 2005).

3.4. Environmental management system as innovative process

EMS is a completely new and large-scale procedure for the organization that adopts it. Most EMSs around the world are implemented according to the requirements of international standard ISO 14001 or the European Union regulation EMAS (EPA, 2007). According to ISO 14001 (2004), EMS is a comprehensive systematic approach to deal with environmental aspects of an organization and enabling it to control impacts of its activities and services on the natural environment in a manner consistent with its policies, goals, and objectives.

While EMS is unique for any organization, there is well-defined pattern to follow, called Plan-Do-Check-Act or PDCA-cycle (figure 3, Appendix 1) (ISO 14001:2004). After completing this cycle company seeks continuous improvement of its performance (figure 4, Appendix 1).

Many researches (Porter and van der Linde, 1995; Grüner et al., 1999; Rivera-Camino, 2001; Hillary, 2004) indicate that EMS implementation leads to a more effective organization of the whole value chain implying that everybody would speak the same ‘language’ and abide environmental law and norms. Herewith this would create new ‘win-win’ potentials, which are clearly larger if co-operation along the value chain is ensured. Moreover, shippers and carriers with ISO certification view a port with an EMS as a progressive and organized business partner (EPA, 2007). Ports widely realize benefits of EMS (EPA, 2007). These benefits are both internal and external and divided on categories (table 1, Appendix 1).

Despite these benefits, there are few barriers for organization desiring to introduce EMS and get certification. External barriers are high costs of EMS certification, problems meeting different stakeholders’ demands, unstable economic situation and changing environmental legislation. As one of the key internal barriers is lack of understanding and awareness of EMS benefits among staff and inadequate knowledge about environmental management process of top-managers (Wehrmeyer, 1996; Smith and Kemp, 1998; Hillary, 2004).

In order to avoid those barriers, top management has to ensure that environmental policy is clear and understood by staff at all levels (ISO 14001, 2004). Therefore, good communication within the organization is very apparent. Numerous studies (Hale, 1995; Daily and Huang, 2001; TURA, 2006; WBCSD, 2011) emphasize crucial role of top management in developing environmental policy, targets and objectives that will lead a company toward improved environmental performance.

Herewith, to develop environmental strategy and achieve increased environmental performance organization undergoes substantial changes that demand introduction of new concepts, skills and transforming experiences.

Considering abovementioned, EMS requires organization to introduce new practices and to re-think its current business approach in order to achieve continual improvements. Therefore, it is argued that EMS can be considered as *innovation*. According to Mezias and Glynn (1993), innovation is 'non-routine and significant organizational change that embodies a new idea that is not consistent with the current concept of the organization's business' and aimed at influencing and shaping changes in the external environment (Burgelman, 1991; Child, 1997). Often innovation is called as "catalyst for organizational change" (Greve and Taylor, 2000; Jorgensen, 2000), though the relation between innovation and change is not deterministic due to failures that may occur after introducing an innovation.

In regard of EMS, the problem has to be identified (through learning about problem) and new knowledge is created to solve a problem. It is needed to achieve targets and ensure continuous improvements. PDCA cycle of EMS requires management to assure continuous learning process (Schaffer and Thomson, 1992), herewith, EMS as an innovation is a process of knowledge building and learning (Agyris and Schon, 1978; Nonaka, 1994; Lam, 2004). ISO 14001 standard provides an example and explanation of learning mechanisms in form of single-loop and double-loop learning (figure 5, Appendix 1).

Single-loop learning happens at Check and correct phase of PDCA cycle when the organization's strategy is being executed according to plan. Double-loop learning occurs at review stage where the overall policy is revised and reconsidered through the entire organization (Epstein and Roy, 1997). Single- and double-loop learning can be summarized into process with specific steps in it (figure 6, Appendix 1). Lindeman et al. (2004) argue that double-loop learning plays an important role in developing improvement initiatives. Moreover, effectiveness of improvement depends on capability of organization to learn and acquire new behaviors and values that is done via employee engagement in such learning (Epstein and Roy, 1997; Daily and Huang, 2001; Little and Little, 2006).

3.5. Employee participation as a long-term sustainability initiative

The employees are ultimate actors in the environmental management initiative of the company. They retrofit behaviors and duties on a daily basis triggering organizational change that is required to reach the targeted improvements in the environmental performance of the company (Jick, 1995; Keogh and Polonsky, 1998). Through training and "learning-by-doing" employees understand how the environment can affect and be affected by their activities and decisions and how they can contribute to resource efficiency and create environmentally responsible organizational culture.

Staff participation and dialogue with executives stipulates and motivates change. Remmen et al. (2000) in a study of Danish companies mention that employees often contributed to the environmental management initiative by bringing "numerous ideas and proposals on how to reduce the environmental impacts from the production process". Often employees see themselves as leading cluster of organization which is committed to environmentally

responsible business. Although, employees indicate that they do not feel sufficiently informed about environmental matters of the company they work in (Madsen and Ulhui, 2001).

Certainly, more and more companies realize that employee engagement brings not only good image to a firm, but also drives business to profit and helps to improve operational efficiencies. Any organization that communicates its goals and cultural approach on environmental change to employees as well as involves them into decision making process, often posses more proactive, respectful and committed business (Deloitte and Touche, no date; Daily and Huang, 2001; NEEF, 2009). Indeed, Denton (1999) argues that “management initiative without employee involvement is useless”.

Whereas there are myriad definitions of employee “involvement”, “engagement”, “participation”, academics often see them as synonymies. Harter et al. (2002) define employee engagement as “the individual’s involvement and satisfaction with as well as enthusiasm for work”, while DDI (2005) uses the definition “the extent to which people value, enjoy and believe in what they do”, often referring to “reaching a heart of employee”. Fleming et al. (2005) similize term committed employees to engaged employees. As last, but not least, Cotton (1993) defines employee involvement as “a participative process to use the entire capacity of workers, designed to encourage employee commitment to organizational success”. Herewith it is pivotal to understand that employee involvement implicates all kind of actions, ideas, behavior and culture within and behind organization’s premises.

According to Daily and Huang (2000), environmental change stipulates organizational change where process of building new organizational culture and knowledge happens. Such “reorientation” of attitudes and behaviors leads to noticeable improvements in organizational performance and drive organization to sustainability(Welford, 1997; Wilson, 1998).

Many authors (Brorson and Larson, 1999; Daily and Huang, 2001; Comtois and Slack, 2007) prove that sustainability can be achieved through employee factor in environmental management. Numerous studies (Enander and Pannullo, 1990; Cramer and Roes, 1993; Atwater and Bass, 1994; Barnes, 1996; Hui et al., 2001) demonstrated advantages that environmental education and training of staff brings to organization and business (figure 3.2).

The definitions and concepts given in the beginning of this chapter have provided a knowledge and insights how actually adoption of EMS, capability of organization to learn, to innovate and to engage interrelated with organizational change and link to continuous improvement. More interestingly concepts of environmental management, sustainable development and organizational learning are following the same pattern of “continual improvement” (figure 7 and 8, Appendix 1). Indeed, sustainable development requires organizations to develop a culture that encourages employee participation, continuous learning and improvement (Charles et al., 2002).



Figure 3.2: Benefits of employee participation

These definitions and explanations were given in order to show a process of sustainability transformation by any organization and what factors play key role in driving such toward sustainable development.

4. Results and data analysis

This chapter provides an introduction to the case study, gives information regarding PoA's environmental policy, its objectives and targets. Moreover, chapter aims at analyzing current activities and programs established and performed by PoA in regard to environmental and sustainability issues. Chapter also provides an analysis of survey data.

4.1. Port of Aalborg profile: services, logistics, business

The Port of Aalborg (PoA) is located in city of Aalborg in North Jutland region of Denmark (image 1, Appendix 2) and characterized as medium sized port that can be compared by size with such Danish ports as Port of Esbjerg, Faaborg and Nyborg (World Port Source, 2012). The PoA's industrial areas are located in the Central Harbor close to the city centre and in the Eastern Harbor 10 km east of the city centre (image 1, Appendix 2) with one hour sailing to the Kattegat (AalborgHavn, no date). PoA plays main role in supplying goods and services to and from Northern Jutland, is easy accessible by ship, truck, railroad and is in 20km distance of Aalborg airport.

PoA is specialized in wide range of activities including handling of containers, loading and unloading of cargo (e.g. steel, building materials), dry and liquid bulk (e.g. oil, methanol, gravel, salt, etc.), cruise shipping, and so forth.

At the present time, PoA Ltd. manages two harbors: Central Harbor and Eastern Harbor. Until April 2012 PoA was an owner of Northern Harbor which was mainly used for cruise ships and loading/offloading of bulk cargo. In this regard, all data given before 2012 are accounted for 3 harbors including the Northern Harbor.

The total area of land used by PoA is certified as for harbor and transport activities and equals 3,9 mln m², with the majority of the areas intensively utilized in the Central Harbor whilst in the Eastern Harbor there are large areas under development (AalborgHavn, 2012).

Central Harbor offers multi terminals for cargo and bulk as well as oil terminal (image 2, Appendix 2). According to AalborgHavn (2012b), almost 45% of liquid bulk in 2010 accounted as oil. Therefore, new tank storage company "The Port of Aalborg Tankstore", dealing with liquid bulk products in class III, such as gasoline and diesel oil, was established by PoA in 2011 and environmentally and safety approved (AalborgHavn, 2012).

The Eastern Harbor is the newest harbor of PoA. Only in 2006 the area began being actively developed for facilities and further expansion. To do so, in 2002 PoA made Development Plan for Eastern Harbor which was adopted by Aalborg Kommune. The plan's goal was to ensure that there are continually sufficient opportunities for development and establishment of activities related directly to port's operations as well as for leasing industries and transport. Likewise, plan aimed at providing a large port emergency, so it can always adapt to changes in traffic patterns and market conditions (Aalborg Kommune, 2006).

Relocation in Eastern Harbor is finalized and area is being called as "Denmark's best planned port area". However, there is still open space for further expansion. According to development plan for Eastern Harbor "LOKALPLAN 08-066" (Aalborg Kommune, 2006), the area is described as not environmentally vulnerable, although PoA has to ensure adequate

distances between the areas with environmentally sensitive land use and relatively harmful to environment activities. According to performed environmental impact assessment, the entire local plan area is located so that it is possible to comply with the recommended environmental safety distances for the types of businesses the plan allows for, and areas with environmentally sensitive land use (Aalborg Kommune, 2006).

Herewith, Eastern Harbor is the largest harbor area of PoA and that is why it is used for range of activities and allocates many facilities such as container handling, project quay, bulk terminal and business park (image 3, Appendix 2). Project quay is supplied with heavy duty machinery for handling heavy goods; bulk terminals include equipment for efficient handling of dry and liquid bulk at its disposal, including indoor and outdoor storage in silos and warehouses plus large outdoor storage sites (AalborgHavn, no date). Warehouses occupy almost 122,000 m² and can be used for storage of corn, plaster, gravel, etc.

PoA's container terminal has the capacity to handle 100,000 containers annually. Container terminals dispose around 75,000 m² for handling and storage of containers plus 85,000 m³ refrigerating and storage capacity (AalborgHavn, 2012). According to Saurama et al. (2008), in 2006 PoA was among top 3 Danish ports in Baltic Sea region for container traffic with handling 63,000 TEU¹. Moreover, according to the same study, PoA was among top 20 ports in Baltic Sea for container traffic (out of 186 ports examined). According to AalborgHavn (2012b), in 2010 PoA handled 55,000 TEU. Additionally, services for cargo include screening, packing and handling, onward distribution, including stock control, public weighted facilities, inspection and quality control. This kind of cargo facilities is equipped with cranes with grab, hook, trucks, container trucks and tractors.

Large quantities of general cargo are stuffed in containers and distributed worldwide. 60% of all containers shipped to Greenland are stuffed in the PoA. The PoA is one of Denmark's busiest in terms of unloading and loading dry and liquid bulk. Total volume of cargo loaded and unloaded at PoA exceeded 3 mln. tones in 2010. According to Saurama et al. (2008), in 2006 PoA was listed in top 10 of Danish ports by total cargo volume (tones). According to StatBank Denmark (2012), amount of goods transported by cargo vessels stays stable for the last 3 years (figure 4.1) and equals to around 2,7 mln. tones. Total amount of ship calls for all 3 harbors comes to 1.674 in 2010 (AalborgHavn, 2012a).

Likewise, PoA disposes facilities for offices, canteen, and health center, also undertakes waste disposal, cleaning and back-office functions.

¹ TEU or twenty-foot equivalent unit is unit for port container traffic that measures the flow of containers from land to sea transport modes, and vice versa, in twenty-foot equivalent units (TEUs), a standard-size container (The World Bank, 2012)

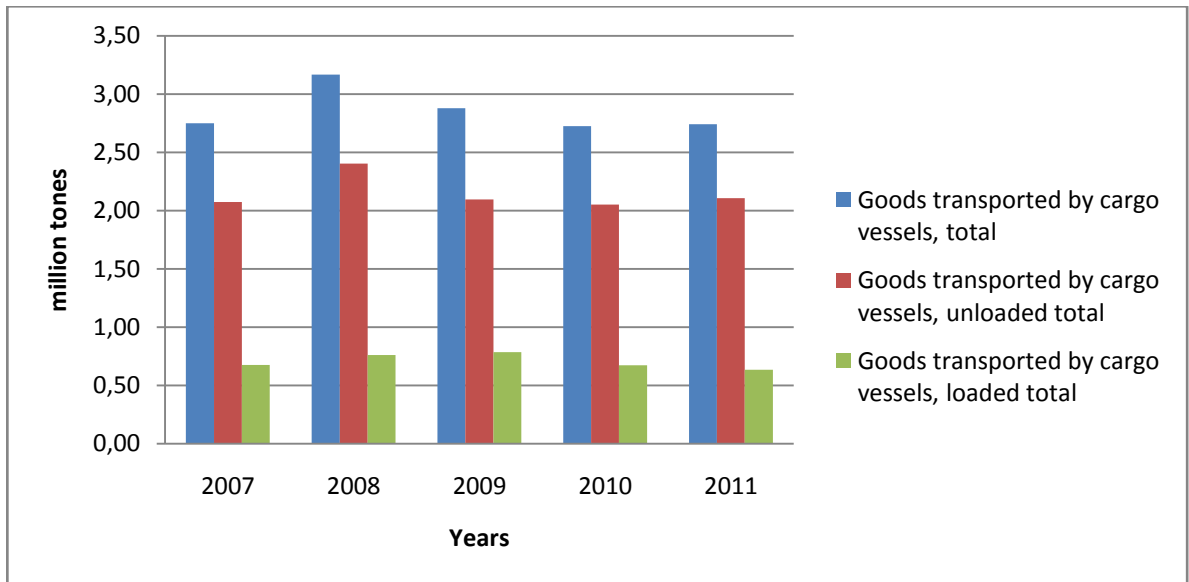


Figure 4.1: Throughput of goods in Port of Aalborg in 2007-2011 (source: StatBank Denmark, 2012)

Currently 58 employees are hired by PoA, while over 1000 are employed at the harbors. In 2000 PoA is converted to a limited company with public ownership² (AalborgHavn, 2012). From then turnover and earning of the company began to rise and in 2011 turnover equals 111 mln. DKK (figure 4.2) (AalborgHavn, 2012b). Despite stable growth, there is noticeable drop in earnings in 2007 and 2009 apparently due to economic crisis (Eubanks, 2010).

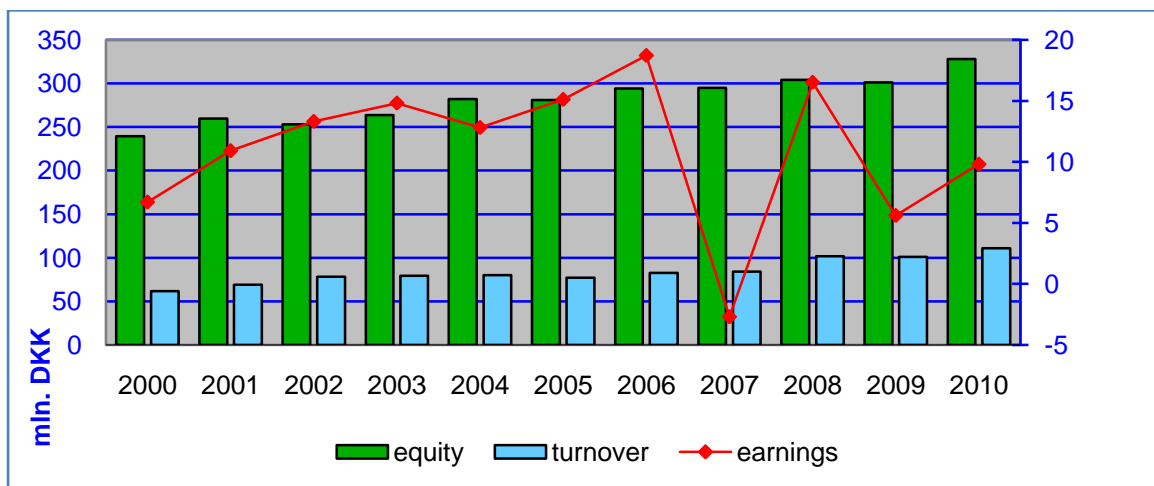


Figure 4.2: Financial profile of PoA: turnover and earnings (source: AalborgHavn, 2012b)

Despite financial profit, PoA's top managers always seek new ways of improving port's performance and minimize effect on environment from port's activities. What is more, PoA motto "Excellence in logistics and cooperation" shows that company drives business with close concern to port's customers, tenants and employees and continuously run projects and establish networks with other businesses, transport and educational organizations.

² A limited company is a company in which the liability of the members or shareholders of the company is limited to what they have invested or guaranteed to the company (Loewenstein, 2012). Public ownership implies that company's shares are freely sold and traded to the public.

4.2. EMS of Port of Aalborg

PoA was and is much known for its values and visions of environmentally and socially conscious business. As any important international port, PoA operates in accordance with certified security and safety plans of ISPS Code established by International Maritime Organization in 2004 (AalborgHavn, 2012). In addition, PoA follows “Standard Regulations for Danish Traffic Harbors” and “Regulations for the Port of Aalborg” (AalborgHavn, 2012c).

PoA has formulated and published on-line environmental policy that is certified according to ISO 14001 (image 1, Appendix 3). According to that policy, port is pledged to use resources efficiently, prevent environmental accidents, work on continual improvements and establish cooperation with relevant stakeholders (image 2, Appendix 3). Also, PoA tries to ensure long-term security in development and services it provides as well as to minimize its environmental harm by appropriate use of technology, introduction of innovative processes and following specific strategic approach. PoA has established environmental targets and objectives with focus on reduction of electricity consumption, minimization of CO₂ footprint and employees’ health (image 3, Appendix 3) (AalborgHavn, 2012a).

Herewith, PoA is recognized as a driver for environmental, logistical, economic and human development at local, regional and national levels.

4.3. Current practices at Port of Aalborg and future trends

According to interview with Brian Rasmussen, environmental and sustainability issues are of high priority for PoA even though the payback period for implementing particular activity is very long. One of the main reasons that triggered PoA to establish EMS and get a certification is to ensure security and responsibility for the environment (interview). Some of the owned land and facilities by PoA (eg. in Central Harbor) are located in sensitive and vulnerable nature, hence, have to be treated respectively. According to data provided by Brian Rasmussen, PoA management spent around 2 years in negotiations regarding this area and around 1 mln DKK on environmental impact assessment. Brian mentions that environmental side is very complex; however, PoA looks at any problem as an opportunity and potential for business and its development.

4.3.1. Dredging

Among the most significant activities PoA practices is utilization of sediments that are extracted from dredging. Dredging of sediments is required in order to keep a depth in fjord of 10,6 m according to regulations. Thus, sediments are dredged along 65 km from both banks of fjord beginning in Central Harbor and ending in Eastern Harbor with nearly 100 000 m³ of sediments extracted. As reasonable solution to utilize these sediments, PoA decided to fill high depth areas with them. If sediments are not very contaminated (usually with heavy metals), they are sent to Aalborg Portland cement factory with which PoA has an agreement.

4.3.2. “Green accounting” service

In order to inform public and relevant stakeholders about PoA’s impact on environment, a green accounting program is visualized and made available at main web-page. It contains diagrams and data of resource usage (namely, waste generation, water, diesel and electricity use) by PoA from 2008 till 2010 (data are only related to the PoA Ltd. not to tenants).

According to graphs, the electricity consumption has been reduced by 6% in 2010 to 2009 and keeps stable at the moment (AalborgHavn, 2012). The reduction can be due to a drop in the use of on-rail-cranes. Heating increased in 2009 and 2010 mainly due to the weather conditions; however, a reduction of 11% has been achieved at Langerak 19 due to windows replacement and 20% reduction in 2010 in departments offices.

Consumption of water has been reduced in 2010 by 4% compared to 2009 levels. Water is primarily used for sanitation and cleaning of machines and material. One of the weakest issues at PoA is diesel consumption. Diesel is used by cranes and ships. Diesel consumption increased in 2010 by 42% in relation to 2009 (22% in relation to 2008). Nonetheless, following recommendations of Garcia Hernández et al. (2012), diesel consumption can be reduced by minimizing idle work and by substitution diesel with cleaner fuels.

4.3.3. Electricity consumption

According to interview with Brian Rasmussen, half of electricity is spent on lighting of outdoor area. In order to minimize consumption, PoA has introduced a program to substitute conventional light bulbs to LED ones. LED bulb can reduce consumption by 75%. By now only several places have LED bulbs installed. However, it is priority step to substitute all bulbs with LED ones (appr. 800-900 LED bulbs needed) and needs to be done gradually in 5 year term. Other measure to reduce consumption is to switch off every second light at night on roads. As a long-term initiative is to purchase and install solar panels. Brian Rasmussen emphasized that PoA recognizes a necessity of solar panels installation because it is the only solution toward carbon neutral port. According to preliminary calculations, PoA will need around 10 000 KW from solar plant for offices. That will require investment of 200 mln DKK and will have payback of 22 years. Nonetheless, PoA adopts it arguing that “solar energy is technology of the future, pathway to carbon neutral society” and if more people buy it, less it will cost.

As a way to promote minimization of CO₂ emissions, PoA has purchased 2 bikes for their employees for free use. There is a plan for buying more bicycles in nearest future. According to Brian Rasmussen, “PoA cares about health of staff and shows an example of wellbeing by promoting alternatives to a car ride”.

4.3.4. Waste minimization

As an example of innovative thinking, PoA brought an idea of waste reduction. There are many loading and unloading operations happen on place, during which many materials are left on-site, considered as wastes and sent to burning facility. As an example of that kind of waste is loss from loading of agricultural crops (wheat, corn, etc). Amount of such waste is around 300 000 tons per year (interview). Here PoA proposes more “intelligent” way of handling these wastes instead of burning them. The decision is to send these wastes to biogas plant. The plant is just 15 km away of Eastern Harbor and the management already stepped up into negotiations with biogas plant. In order to avoid extra transportation, wastes after each loading operation are to be collected in a storage container and later sent to the plant. As Brian Rasmussen points out, “PoA brings practical solutions for problems, not theoretical”. Moreover, to make this program work, a group of four people (Brian Rasmussen, track driver and his chief, and coordinator of the traffic) was established.

4.3.5. Employee participation initiative

Management of PoA recognizes importance of employee involvement, firstly, in implementing environmental programs, secondly, in driving organization toward sustainability. However, there is no developed program for employee participation yet. Recently a group of 4 people was formed with aim to discuss issues that have to be included in program for employee training. As essential tools to motivate and engage employees, management sees training courses and workshops (interview). As a part of organizational communication program, PoA provides information regarding environmental and business activities through “Friday mail” which is delivered to all staff at PoA weekly. Furthermore, via internal system “Improve” every employee has an access to all reports, documentation and information about PoA’s activities. Besides, to inform external partners, transport journal is issued every 3 months and delivered to all companies renting land (image 4, Appendix 2).

4.3.6. Collaboration with stakeholders and networking

Sustainability is a process that requires new approaches and actions. PoA is constantly looking for new possibilities of becoming more environmentally friendly, socially responsible and profitable business firm. In order to track latest trends and pull its own ideas, PoA is facilitating collaboration among companies and academic institutions. As an example of such co-operation is work with private ports Aalborg Portland Ltd. and Vattenfall Ltd. with common interest in the service between the Kattegat and Aalborg (AalborgHavn, no date).

Among other active networking partners of PoA are: 1) HubNorth (Wind Power Development and Production Centre); 2) Arctic Business Network that develops commercial co-operation between Greenland and Northern Jutland; 3) CELOG, Aalborg University’s Centre for Logistics, established in 2010, supported by the PoA; 4) Nordjysk Transportklub is a forum for development, knowledge and debate, where PoA operates a secretariat for the network; 5) ErhvervsNetværk 9220, is a co-operation between businesses in the eastern part of Aalborg, a promoter of continuous development of the area’s infrastructure (AalborgHavn, no date).

By establishing partnerships and creating networks, PoA acknowledges that it is essential to share knowledge and practices among companies in order to achieve significant benefits. Even though not every business is willing to invest into sustainable practices, as PoA tries to do so, management of PoA believes that it can become a good example to follow for many firms in the nearest future.

4.4. Sustainability vision by Port of Aalborg

Sustainability strategy development is on-going process at PoA. According to interview with Brian Rasmussen, “sustainability for PoA is a culture and intelligence”. Namely, managers see employees’ mindsets and commitment that stipulate sustainable development of organization. In order to think in sustainable way cultural change is needed.

PoA has already set-up long-term objectives, which will lead PoA to sustainable growth. Important, that these objectives are about changing habits and culture for the PoA’s employees and engaging external cooperation partners and tenants (AalborgHavn, 2012). It shows that PoA tries to influence and engage an entire logistic chain into process of creation of sustainable society.

Specific long-term objectives for PoA are following:

- Involve tenants and cooperation partners in environmental objectives
- Explore the possibilities of involving tenants and cooperation partners in reduction of electricity consumption
- Work toward establishing wind turbines in Rærup together with Nordjyllandsværket (power plant)
- Seek for more environmentally friendly solutions of loading and unloading of ships
- Ensure low energy consumption in newly constructed buildings
- Use the rail road (as transportation by train has less emission than transportation by truck. In addition, this also helps take the load of road traffic)
- Introduce alternative energy forms for transport, e.g. electric cars
- Develop climate- and energy strategy, including ideas for CO₂-neutral port, wind turbines, solar energy and groundwater cooling/heating

In order to understand what kind of measures have to be taken for successful employee engagement, results of survey were analyzed and the type of environmental strategy was identified in following part.

4.5. Survey analysis: environmental attitude and training interests of employees of PoA

According to survey results, all respondents³ confirmed that PoA has established its environmental policy and actively cares about environment. 50% of respondents knew that sustainability strategy either developed by PoA or being under development while other 50% did not know anything about it. Around 90% of respondents confirmed that they get information regarding PoA's work with environment/sustainability mainly via Friday's mail (Fredagsmail), followed with information received from environmental coordinator and staff meetings. Likewise, on question regarding the most convenient/preferable (according to staff's opinion) way of exchanging information about environment and Port of Aalborg's performance, employees still acknowledge e-mail and environmental coordinator (figure 1, Appendix 4). Almost 75% of respondents confirmed that they are interested in participating in different programs and activities related to environment and sustainability. Thus, almost half respondents (43%) were interested in participating in environmental and resource saving projects, while 32% want to join a team for generating ideas and launch projects directed to resource efficiency (figure 2, Appendix 4). What is more, 29% respondents mention that they have ideas regarding resource saving practices at PoA, which are: print less or double-sided, turn off heating and PC when is not needed or before leaving work, installation of solar panels.

In relation to general questions about environmental programs and activities and resource efficient practices, all respondents agree that environment protection is an urgent

³The gender proportion of respondents is 80% males to 20 % females. An average age of respondents is 45 and average employment period at PoA is around 6,5 years. Respondents were employees of all departments of PoA.

issue and PoA has to be committed to this process (figure 3, Appendix 4). Unanimously was approved that caring about environment helps to save costs and reduce resource consumption. What is more, all respondents assert that even without support of external partners, PoA has to be responsible for environment and show "good example" for other businesses. Almost 90% of respondents stated that any environmental program introduced at PoA will enhance their knowledge regarding environmental issues and sustainability, while 43% and 36% agreed that it will help to trigger new ideas, engage more staff and provide information about current trends and practices respectively.

On question "What could get you as an employee to focus more on the environment in your work?" 93% of respondents specified community volunteer programs; 79% and 78% specified competition among departments or business units and employee handbooks or policy documents respectively. Around 70% agreed that internal "green teams", training meetings, internal communications campaign and guidelines and instructions for processes and activities will be helpful to foster staff participation (figure 4, Appendix 4). Important to stress, that almost all proposed in question options were marked as effective in participation process. As the most important motivation to behave environmentally responsible at work employees at PoA acknowledged concern for the environment and society, 72%; 14% referred to success stories about other employees' accomplishments and 7% – to company's regulatory requirements and recognition among colleagues. Notably, no one marked financial rewards and job bonus as important for motivation (figure 5, Appendix 4).

Also respondents were asked a question borrowed from study "Greening of human resources: environmental awareness and training interests within the workforce" by Madsen and Ulhùì (2001). Study was based on assessment of results from survey about environmental attitudes and training interests among Danish workers. Target groups of respondents were all categories of managers and workers. Conclusion, drawn from that study, was that, in overall, respondents were very aware of the environmental consequences of their job and of the existence of an environmental policy in their company. The same conclusion can be derived from results of present survey. In regard with question "who is responsible for ensuring that environmental problems are kept at a minimum?", 93% of respondents from PoA designated companies and 79% stated themselves along with EU and state as the most responsible for minimization of environmental problems whereas the majority of respondents from study by Madsen and Ulhùì (2001) marked themselves as the most responsible (figure 6 and 7, Appendix 4).

Survey that was available on-line is exhibited in Appendix 5.

5. Discussion and recommendations

This chapter provides discussion about PoA's corporate strategy, culture and their influence on sustainability posture of PoA. Moreover, chapter includes toolbox: recommendations for managers of PoA upon successful introduction and implementation of employee participation programs and suggestions of moving toward sustainability-oriented strategy.

5.1. Current strategy type of Port of Aalborg

In this research strategy of PoA was identified according to typologies of strategies proposed by Roome (1992), Ford (1992) and Hart (1995). Summary of these three typologies is given in table 5.1.

Author					
Ford, 1992	Criteria	<ul style="list-style-type: none"> • Priority given to the environment in a strategic context • Consideration given to changes according to environmental management • Reaction with regard to demand of consumers 			
	Stages	Inactive	Reactive	Proactive	Hyperactive
Roome, 1992	Criteria	<ul style="list-style-type: none"> • Fulfillment of legal demands and respond to social pressure • Consideration of environmental management 			
	Stages	No-compliance	Compliance	Compliance plus	Commercial and environmental excellence
Hart, 1995	Criteria	<ul style="list-style-type: none"> • Consideration of environmental management • Investments in employee skills; in conventional green competencies and procedures • Leadership posture 			
	Stages	The end-of-pipe approach	Pollution prevention or total quality management (TQM)	Product stewardship	Sustainable development

Table 5.1: Strategies types by Ford, Roome and Hart (elaborated from Ford, 1992; Roome, 1992; Hart, 1995; Buysse and Verbeke, 2003; Fernandez Gago and Nieto Antolin, 2004)

Analyzing activities and programs established by PoA in regard with EMS and sustainability, as well as PoA's active work with employee involvement and stakeholders, it is decided that PoA is currently based on stage "product stewardship" according to Hart's typology (table 5.1; bold font). In case of PoA is it rather "process stewardship" where new processes and activities are designed to minimize environmental burden (eg. wastes for biogas). In regard to Roome's typology, PoA is placed on stage 4: commercial and environmental excellence that corresponds to Ford's type "proactive". Referring to Roome (1992), real organizational change cannot occur until a firm reaches the fourth stage of "excellence". Therefore, after analysis of PoA's vision and environmental objectives, it is evident that PoA is undergoing substantial changes, consequently, has reached stage

“commercial and environmental excellence”. With Ford’s classification the strategy is “proactive” since PoA have been embedding environmental issues into its strategic planning and have already chosen its vision of sustainability strategy. Moreover, PoA has shown its anticipation of future changes by seeking more “alternative” solutions, eg. use of “technology of the future”, and actively collaborating with its stakeholders.

5.2. Organizational structure, culture and climate at PoA

Considering given information, interview with Brian Rasmussen and results of survey, it becomes evident that PoA has top-down organizational structure, however with mix of “bottom up” practices. For instance, review of organizational structure of PoA (Appendix 6) allows us to see that different departments are following horizontal pattern, meaning that every employee has to approach the head of the department who already approaches the higher level of management. According to Brian Rasmussen, through him, as representative of environmental division, employees address and bring their ideas that are later communicated to top management. Referring to results of survey, around 42% of respondents agreed that the culture at PoA is open and supportive, 29 % named PoA’s culture as learning and exchanging and 29% marked it as financially driven.

5.3. Toolbox for PoA: successfully engaging employees and moving toward sustainability

Based on survey results and PoA’s analysis, recommendations for management of PoA how to introduce and support employee participation in sustainable development activities were compiled into a toolbox. The latter also suggests the best tools for motivation and engagement of employees and what general comments upon PoA’s move toward sustainability.

5.3.1. Employee engagement

There are following key elements suggested for successful employee engagement at PoA:

1. *Proactive communication and interaction*. It is crucial to establish good communication channels and interaction between all levels of staff. Important to make employee understanding value and visions PoA shares and operates under.
 - 1.1. E-mail, environmental coordinator and group meetings are identified to be the best channels of communication at PoA, therefore, have to be strengthened in terms of quality of information delivered via them.
 - 1.2. It is highly important to develop a feedback process through which employees bring their suggestions and share ideas. It is suggested to create share boxes or blackboards where employees can write down their ideas especially when where is no chance of ‘face-to-face’ communication.
 - 1.3. Use qualitative and quantitative measures such as surveys, interviews, etc. to assess employees’ initial knowledge and knowledge retained after trainings or meetings.
 - 1.4. Along with Technical Journal release guidebook with guidance for specific activity or procedure or compilation of best practices, provide employees with handbooks and policy documents.

2. Training

2.1. Initiate environmental training programs such as activity-centered (i.e. directed to change behaviors and attitudes) and results-driven (i.e. aimed at prioritizing areas for the most urgent performance improvements). Both have to address the environmental impacts and issues of PoA as well as inform employees about their responsibilities.

2.2. Initiate awareness training programs regarding adoption of new processes, programs or policies.

2.3. Training has to be initiated in “green teams” for better problem-solving and provide personnel exchange

3. Education and learning. It is very advisable to assess employees’ knowledge level regarding environment and work PoA does in its regard.

3.1. As seen from survey results, 50% respondents (employees of PoA) are familiar with environmental and sustainability work of PoA. Nonetheless, it is important to enhance education of employees about general environmental issues and related to PoA’s activities. It is also essential to report about benefits that are/to be achieved and benefits of training/learning itself.

3.2. Educate employees about double-loop learning and involve them into process/activity improvement.

4. Involvement and encouragement: PoA have to keep its supportive and encouraging culture to foster employees’ ideas generation, innovative, strategic and creative thinking.

It is advisable to include volunteer programs and initiate competition among departments for environmental and sustainability improvements.

This study has shown that PoA’s employees attitudes are important predictors of perceptions of employee involvement.

5.3.2. Becoming hyperactive — achieving sustainable development

Besides focusing on staff involvement, PoA has to adopt more proactive corporate strategy. Furthermore, the overall alignment between PoA’s strategy, values, and commitment provides organizational pre-conditions for developing long-term goals and vision for sustainability strategy. PoA treats environment as its primary stakeholder and sets it forth as a strategic driver promoting environmental stewardship. PoA also acknowledges its readiness to invest in advanced technology, environmentally-driven activities and human resources.

Therefore, PoA has high chances to establish itself as a sustainability leader. To attain the leading edge of corporate performance, PoA has to strive for hyperactive and sustainability-oriented strategy. To do so, PoA has to make a comprehensive assessment of risks and opportunities that would any of suggested by PoA process or activity bring (see chapter 4). The advantage in taking hyperactive strategy is that PoA can integrate changes within its own pace and in cost effective manner. Besides, strategy assures gaining competitive advantage (Judge and Douglas, 1998; Klassen and Whybark, 1999), positively impacts the bottom-line,

especially profit (Porter and Van der Linde 1995; Esty and Porter 1998). What is more, such “strategic identity” of PoA will foster internal communication even more and likely to engage more partners. However, there are always risks associated to economic trends and stakeholders’ responses.

Considering network activity of PoA, it is suggested that, with help of current proactive strategy, PoA can change its business model (business model is not the same as strategy (Margaretta, 2002; Yip, 2004). Business model helps to describe the position of the firm within the value network, articulate the value proposition through value chain (Chesbrough and Rosenbloom, 2002). Being sustainable only possible when the whole system of which a firm is part is sustainable (shared vision of the future) (Jennings and Zandbergen, 1995).

It is also suggested that, besides sustainability goals, PoA has to develop sustainability indicators to measure its social, environmental and economic performance. Indicators help to improve internal and external transparency and accountability of a firm, to show the “added value” and to raise public awareness (Darby and Jenkins, 2006). Sustainability indicators can be economic impact, skills and training, capacity building, promoting energy reduction and wastes management at PoA.

Reporting can serve as another sustainability indicator. It is often seen as a good tool to increase employee engagement and morale and raise public awareness (Ramus, 2002). Although some argue (Stubbs and Cocklin, 2008) that reporting does not necessarily mean that company is sustainable, therefore, not a good indicator of sustainability.

Given recommendations unveil how to successfully engage and encourage employees to regard environmental initiatives at PoA. Employees ensure that values are transformed into company’s profit and resilience in long term.

This toolbox can help management team of PoA to establish employee involvement program and consider techniques that are useful for successful program implementation. This chapter illustrated the change that is necessary for PoA to move from its current strategy toward sustainable development.

6. Conclusion

This chapter is a summary of all research findings that helped to answer the research question. Before that, sub-questions were gradually answered and collected information led to recommendations and conclusion.

What are the benefits of employee participation?

This first question aimed at identifying advantages of employee participation in environmental activities initiated by any organization. Those benefits are increased company performance, reduced environmental impact, improved image and competitive advantage and many others. Many researchers have proven that it is crucial to involve employees. Question also aimed to communicate those benefits to managers of PoA and all personnel.

What actions is Port of Aalborg taking to address sustainability issues?

This sub-question was important to answer due to possibility of revealing the current work by PoA addressed at minimization of its environmental impact and considering sustainability issues. Thus, PoA has shown that it tries to diminish the amount of wastes generated at port's area by collecting and sending them (mainly bio wastes) to the biogas plant. Also, vast amount of sediments extracted during dredging are sent to the Aalborg Portland cement factory. PoA tries to minimize its electricity consumption. First, PoA identified what are the biggest sources of electricity consumption. Second, PoA purchased LED bulbs to substitute normal bulbs and developed a plan to switch every second light in outdoor area at night. "Green accounting" established to monitor the change in electricity, diesel and consumption, and waste generation. It helps to identify years of increased consumption as well as the reason of it and develop respective solution. PoA currently is an active member of 5 networks and seeks for co-operation with many others relevant partners.

What is Port of Aalborg's organizational strategy and values?

It was important to analyze organizational strategy, culture and values of PoA. Using typologies of strategies, PoA's environmental strategy is identified to be proactive (Ford, 1992) that corresponds to strategic stage of commercial and environmental excellence (Roome, 1992) or product stewardship (Hart, 1995). Moreover, a culture at PoA is identified to be open, supportive and learning and is a sign of good organizational learning capabilities of PoA. Thus, these findings helped to argue to what direction PoA needs to move and what strategy to adopt in order to move toward sustainability.

What are the current knowledge and level of readiness to change of employee of PoA?

This question was answered with help of survey. It aimed at analyzing the overall knowledge and readiness employee to be engaged into environmental initiatives at PoA. Survey also helped to identify what are the best tools to involve employees, what would motivate them and how to raise their awareness regarding environmental/sustainability issues. Eventually, employees of PoA have shown their overall readiness and willingness to change; their knowledge and skills are assessed to be satisfactory. Positive job climate and support from managers encourage employees to be involved into environmental programs.

How can stakeholders be engaged into sustainable development process driven by Port of Aalborg?

This research has shown that PoA proactively collaborates and establishes networks with businesses and educational institutions. Through networking PoA and partners share best practices that help organizations to generate sustainability solutions as well as foster organizational learning and knowledge exchange.

All in all, the compilation of sub-questions leads to the main research question, namely,

How can employee engagement guide organizational change toward sustainable development?

The answer to that question is given by analysis of all sub-questions, grounded with interview, survey results and theoretical framework. Thus, toolbox with recommendations and suggestions provides an answer to main research question. It unveils that relevant communication tools, programs and trainings, exchange of personnel and motivation can ensure successful employee engagement that consequentially will lead to transformation of corporate strategy toward more sustainability-oriented. Recommendations are given to enhance management's and employees' knowledge, conversance and commitment to environmentally friendly and sustainable performance.

Also, it is suggested that PoA has to undertake hyperactive strategy and strive at becoming sustainable. This study proposes to foster further collaboration with stakeholders and establishing networks and well as shaping new business model and developing sustainability indicators. Suggestions about business model and sustainability indicators may be of high interest for perspective researches.

All in all, this study shows that for PoA sustainability means innovation and culture. PoA treats natural environment as primary stakeholder and promotes environmental stewardship, considers stakeholder needs and tries to engage its employees into environmental initiatives.

PoA can adopt robust corporate strategy and become a pioneering and sustainability leading business among Danish Ports. In pursuing this approach, doubtless, PoA has to face challenges associated with economic trends, changing internal and external cultures and attitudes, stakeholders' and customers' needs.

Special contribution of this research to the current literature about organizational change, employee involvement and achieving sustainability is that it provides application for multifunctional company that is at transitional stage of becoming sustainable and would like to successfully involve employees into that process. Moreover, embedding sustainability into culture is still an emerging field of research and this paper has shown an example how single case study findings can contribute to literature.

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