



Development of the Hub concept

A Study of Clusters and MoS ports

StratMoS WP C



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Summary: This report explores the concept of clusters in economic development strategies and bridges this with the concept of Motorways of the Sea (MoS) with the aim of improving hub and hinterland connections, communication, coordination, services, efficiency, management, etc. to MoS ports. The report examines several industrial clusters to learn which lessons can be learned for improving MoS activities. Interviews were undertaken with key stakeholders (regional government, cluster organisation, port authorities, etc) who contributed their ideas and thoughts on ways to improve MoS transport.	
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Preface

The StratMoS project is a part of the North Sea Interreg IVB programme. The StratMoS project is in progress from January 2008 to March 2011 and has partners from Norway, Belgium, Denmark, Germany, United Kingdom and The Netherlands. Furthermore StratMoS partners remain in cooperation with partners from North-west Russia. This present Work Package C report has been developed and written by FDT- Association of Danish Transport and Logistics Centres with support from WPC partners.

The report consists of 8 chapters.

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Introduction to Report

Chapter Summary

This chapter will.....

- Introduce readers to the project and the rationale behind exploring the 'cluster concept'
- Review some background research into clusters and port development
- Highlight the objectives of the report
- Show the main actors represented in the report

One of the ultimate goals of Motorways of the Sea (MoS) is to shift cargo off European roadways and onto more environmentally sustainable modes, such as Short Sea Shipping (SSS) and rail transport. This also includes increasing the use of intermodal transportation - combining rail, sea and road to optimize the transport chain by making the most effective use of transport modes. Building upon the research and final reports written under StratMoS Work Package-C (WP-C) 1, *Identifying and Analysing the Characteristics of Complementary Ports: A Study of Ports in the North Sea Region*, and WP-C 2, *Dry Port – Concept and Perspectives*, the next phase of WP-C, C-3, has looked at ways to strengthen the overall concept of MoS by

examining ways to bring about a more coordinated approach to cargo transport amongst actors in the supply chain.

The overall aims of WP-C are to strengthen the role of ports and hinterland facilities in door-to-door transport chains with a view of improving the effectiveness of the intermodal transport chain. This also includes strengthening both the primary and secondary hubs and the logistics facilities by analysing possibilities, constraints and challenges for inland transport operators and associated facilities in form of transport and logistics centres, ports, dry ports, transport infrastructure, etc. in order to stimulate MoS. The European Commission describes the role of MoS in the transport chain as follows:

The “motorways of the sea” concept aims at introducing new intermodal maritime-based logistics chains in Europe, which should bring about a structural change in our transport organisation within the next years to come. These chains will be more sustainable, and should be commercially more efficient, than road-only transport. Motorways of the sea will thus improve access to markets throughout Europe, and bring relief to our over-stretched European road system. For this purpose, fuller use will have to be made not only of our maritime transport resources, but also of our potential in rail



and inland waterway, as part of an integrated transport chain. This is the Community added-value of motorways of the sea.

Website European Commission – DG MOVE - 2010

The low number of MoS projects currently in operation around Europe, after five years with the MoS programme, has resulted in a situation where the full benefits of sea transport and intermodal transport are not being fully utilised. These benefits include less environmental impacts of goods transport, less congestion and more optimal use of resources. The MoS should be no more complicated to use than traditional motorways. Exploring and discussing ways to improve conditions for successful MoS initiatives, the number of MoS projects and ways to improve the overall transport chain to and from ports, needs to be further explored. This is the purpose of this report. It has been suggested that one new way of looking for better MoS solutions, as a door-to-door transport chain, can be learned by examining the **cluster** concept – which demonstrates aspects that can assist in strengthening transport hubs, communication and coordination in transport supply chains. These lessons could be useful for establishing new or improving existing routes. Clusters are an important component of many successful business case examples found around the world and as a result there is much that can be learned from further exploring which lessons can be beneficial for MoS and the overall transport industry. From IT business clusters, to the food industry clustering to automotive manufacturing clusters, the geographical strengthening of business units is an important component in many regional and national development plans.

This WP C-3 report will therefore aim to explore what can be learned from clusters and how this can be used to strengthen the MoS concept. The main hypothesis and reasons for exploring clusters is that there appears to be little communication taking place outside current MoS supply chains, beyond the actual seaport itself (de Oliveira 2009). Some of the lessons learned from existing clusters have shown that improvements in communication can occur between actors (suppliers, forwarders, shippers, etc.) in a cluster and therefore it is the feeling that it would be beneficial to explore how this works. If communication can be improved between all actors, an increase in coordination and efficiencies may be achieved – something which is found to be lacking based on



documentation in the WP C-1 report¹. Improving coordination and efficiencies in the supply chain will ultimately be useful in optimising sea shipping and contribute to increasing the attractiveness of SSS as an alternative to goods being transported by road. In addition to this report, another report entitled WP C-3b, aims to explore issues surround the development of Information and Communication Technologies (ICT), around the MoS concept. This report is being lead by the University of Hull and will be made available on the StratMoS webpage when completed at the end of 2010.

It is widely recognizable that ports, which are one of the main MoS's components, can be qualified as clusters. As already reported in the C-1 report, several ports, such as CMP [Copenhagen and Malmo], ADP [Fredericia-Nyborg-Middelfart], The Mersey Docks and Harbour Company [Liverpool, Heyshame, Sheerness and Chatham], the Flanders Port Area [Antwerp, Ghent, Zeebrugge and Oostende] and the Humber Ports [Grimsby, Immingham, Hull and Goole] are already acting as port clusters and benefiting from increased synergies between several transport related firms and shipping services. Other ports are also benefiting from less formal arrangements, such as seen with the Port of Amsterdam's cooperation with Port of Rotterdam and the North Sea canal ports. Furthermore, other MoS components, such as the Logistics Centres and Dry Ports also fulfil some of the cluster criteria, such as spatial concentration of entities in a specific location. Usually the sectoral specialization, interdependencies between actors and economies of scale, etc, can be achieved when clusters are strengthened (see Figure 1 on page 10 for a pictorial representation of this). In such a state of affairs, there are huge possibilities for the further development of MoS by improving these ongoing clustering efforts and increasing the cooperation between actors in MoS value chains.

1.1 Objectives

There are several broad objectives with the undertaking of this report. These include but are not limited to:

- Build upon and expand on the research conducted in the WP C-1 & WP-C 2 reports

¹ In the C-1 Report, communication was shown to be lacking most between the port and the hinterlands. Once goods left the port area, there was little understanding about where goods were going. Others indicated that the reasons for not using SSS was due to the coordination difficulties between production and shipping times and/or lack of knowledge of various SSS alternatives at various ports.



- Further explore how MoS activities can be fully developed and integrated into existing and new transport supply chains
- Explore the concept and real life cases of clusters from other industries and examine how they can benefit the transport and logistics industry, particularly increasing cargo via ports
- Provide a critical assessment, based on key actors working in the transport and logistics fields, as to how cluster can be used to optimise supply chains
- Assess the present MoS services already in operation
- Make recommendations for how to improve MoS
- Examine ways to enhance cooperation with actors in MoS transport chains
- Conduct a workshop where the research can be discussed, assessed and sound recommendations can be made based on a broad network of experiences and inputs from various partners

1.2 Background Research in Clusters & Ports

Clusters can be defined as interdependent organizations which are geographically concentrated and operate within the same value chain. When applying this to seaports, a seaport cluster is one where firms at or near the port are engaged in the movement of goods to and from the port. These clusters also include logistical activities, administration activities and manufacturing firms which rely on the port for some part of their transport chain. Researchers and economists have identified the importance of clusters in influencing competition between firms, regions and countries. According to Reve & Jakobsen (2001), some of the advantages and aspects of clusters include:

1. Better access to competent people and innovative ideas
2. Better access to specialized suppliers and demanding customers
3. Better access to research and development, leading to lower costs of doing business
4. Better access to venture capital and competent investors

These four points will be explored further in this report with real cluster case examples. Aspects of these given points will be highlighted in a matrix (Figure 28 on page 99) which will show both how some of the existing clusters found around Europe meet the cluster criteria and what lessons can be learned from them.



In terms of port development, the below figure depicts a good visual representation of about the movement of port development from an isolated port to a port community connected to the world. This representation is also a reflection of one of the aims of WP-C 3 and this report, namely to strengthen the port’s functions and ties to its hinterland and regional economy, thus becoming more of a port in “Stage 4”. With the aim of shifting more cargo onto to SSS networks and off the roads, the ports will need to increasingly play a more central role in facilitating this move. Moving beyond Stages 1 & 2, the port should be viewed as a community where efficient and seamless supply chains can be developed to connect all actors in the chain.

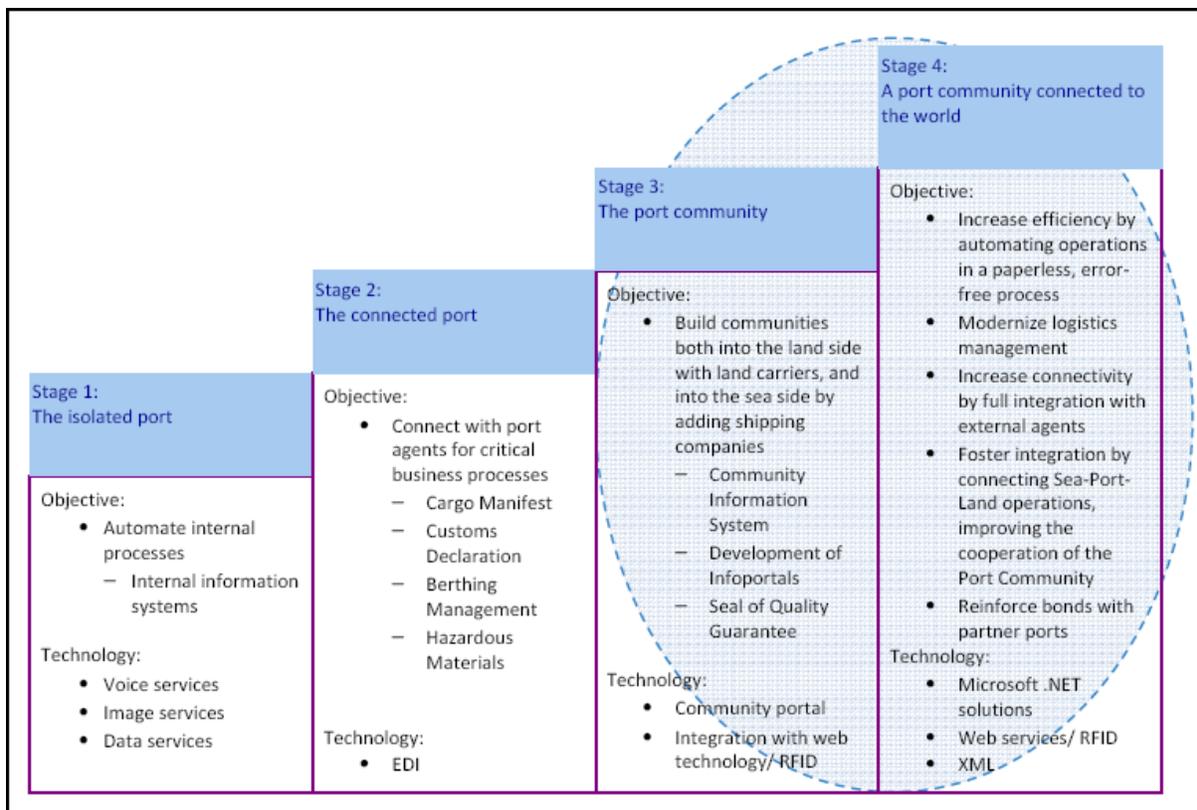


Figure 1: Port Development Stages

Source: Global Maritime Logistics Council, Seaport Cluster Research Programme 2007-2011 Preliminary findings June 2009

In their work on best port practices, the Global Institute of Logistics (GIL) found that once goods exit the port area, there is little communication between actors in the supply chain. This development takes place despite the fact that the prosperity of the port is directly linked to



developments in the port's hinterland and corresponding supply chains. GIL's research concluded that there is little to no formal communication in the majority of port clusters and revealed that there is a need to better understand and foster relationships between all stakeholders in the supply chain. To bring about an optimized supply chain system, collaboration and cohesion is advocated for. This is something which clusters can assist with.

While current academic thoughts state that competition for goods will increasingly be fought in the hinterland, as opposed to the port itself, there is a need to bring about better coordination amongst stakeholders to improve competition (Notteboom 2008). As such, supply chains need to be optimized, customer service must improve and transport costs must remain low and competitive which will enable the port to become an effective and important link in global supply chains (Robison 2002, Carbone & Gouvernal 2007, and Notteboom & Winkelmann 2001). In short, the above statements suggest that **what needs to be the focus of improving the ports' performance is the optimization of relationships**. As such, the focus of this report on best practice aspects of clusters and how they can be used for ports and corresponding supply chain is appears to be an interesting and potentially beneficial area to explore for improving hinterland connections.

1.2.1 Chapter overview

Chapter One provides an introduction to the report and some of the issues that will be explored. It also presents some background material and the report's objectives.

Chapter Two presents the reader with the goals of the report, how these goals are fulfilled and how the report has been researched and put together. It also discusses the limitations of the report. The main research question, and sub-questions are presented as well as the methodology use to write the report.

Chapter Three provides an overview of the MoS concept in light of five years of the MoS programme and presents some of the current challenges and prospects of the concept.

Chapter Four introduces the reader to the concept of clusters and explore four case examples and some of the lessons to be learned from these industrial clusters.



Chapter Five introduces the reader to the four MoS ports that are examined in this report – Esbjerg, Denmark; Zeebrugge, Belgium; Sassnitz, Germany; and Trelleborg, Sweden. General issues surrounding the port and their experiences with MoS are discussed.

Chapter Six provides an analysis and discussion on clusters, SSS/MoS and presents the reader with lessons to be learned from the previous chapters – case studies, MoS ports etc., which may be useful in improving MoS activities and the condition in which MoS operates in.

Chapter Seven provides conclusions to the report and answers to the research question.

2 Methodology

Chapter Summary

This chapter will.....

- Demonstrate the aims of the project and how they will be achieved
- Present the main research question and study approach
- Discuss the limitations of the report

This report aims at providing a strengthened perception for the MoS concept, building on the results of the two previously produced WP C reports (C-1 & C-2). The WP C-1 report focused on ports and their opportunities for cooperation and hereby complementing each other. The second report, C-2, analysed the Dry Port concept, and focused on including hinterland facilities, terminals and rail transport infrastructure in the Motorways of the Sea logistics chain.

Figure 2, on the next page, depicts the subjects of interest of WP C3. Since the previous reports took into special consideration the ports (WP C1) and hinterlands (WP C2), this report – WP C3 - broadens the horizons and analyzes all actors involved in the MOS as well as the relationships and interactions between parties. Thereby, this current report will broaden the scope of the already achieved results, meaning that ports, hinterland connections, Dry Ports, terminals and logistics operators will be looked into from a network and clustering perspective, concentrating on the regional opportunities and effects, which can be learned and possibly transferred from the cluster perspective. This can hopefully stimulate ports, logistics operators and authorities in creating even stronger networks for using MoS ports and intermodal transport.

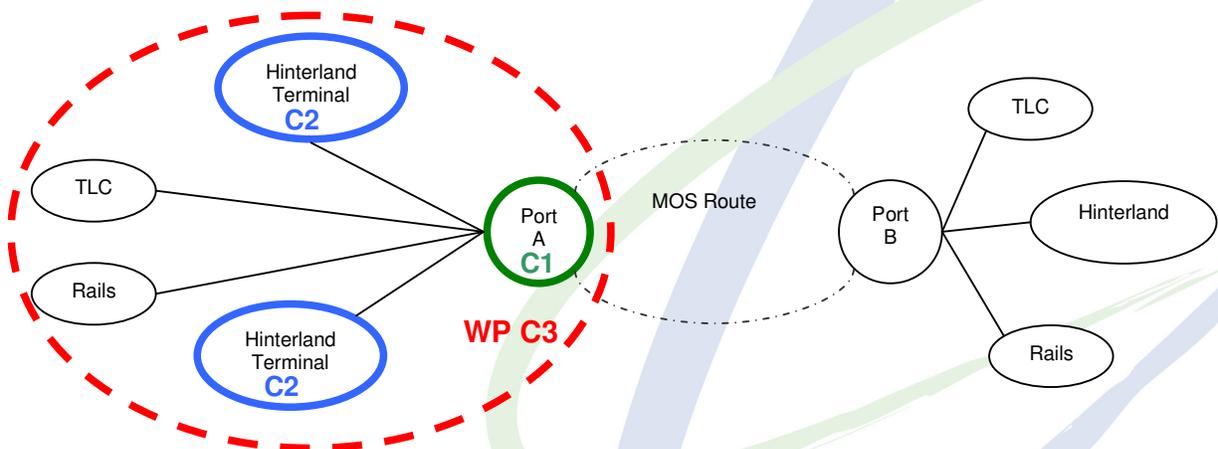


Figure 2: Diagram of the focus area of WP C-3



2.1 The main aim of this report

The main research aim of this report is to answer the following question:

What lessons can be learned from industrial clusters and which ones show potential to stimulate and strengthen MoS activities?

In order to answer the above main question, a series of sub-questions will also be answered in.

1. How can clusters be used to improve the efficiency of current transport policies and initiatives?
2. What tools can cluster managers use in order to develop stronger and more competitive cooperation?
3. How can cluster initiatives be used in broader policies to improve overall economic efficiencies?

Current conditions and background research have concluded that the current settings in which MoS is operating is not being fully utilized as it was originally intended to be. Therefore, it will be beneficial to explore the ‘current state-of-affairs’ of MoS ports and developments by looking at the possible lessons to be learned from other business initiatives, such as clusters. It is thus the aim to explore some of the positive lessons to be learned from cluster cases and explore what could possibly be transferred to MoS solutions. This will hopefully allow for an improved MoS concept and networks, while also decreasing road-only transport to increase more intermodal and more sustainable forms of goods transport.

Many scholars and business practitioners agree that cooperation between business units is not only necessary, but essential in the current economic environment. Thereby the current economic setting makes the need to change the traditional way of “conducting business” important for the future success of increasing rail and SSS. The innovative solutions, which can be made possible by enhanced cooperation, needs to be implemented by all transport actors in order to increase the competitiveness of sea shipping. This is one of the reasons why institutions such as the European Union and several International and National Authorities all promote the concept of clustering and



provide support for the development of existing clusters. Additionally, existing practices, research and studies will be examined to better understand the clustering process and its importance for the transport and logistics industry. This will enable the creation of an analytical framework to explore how cluster initiatives work in real life and what lessons could be potentially transferred to the transport industry. Such analysis will be based on existing clusters case studies from most North Sea Region countries, which will allow us to identify key success factors in clustering. This will also enable some of the final results in the C-1 & C-2 reports to be further explored, while bringing some new and potentially beneficially attributes for ways to improve door-to-door supply chains.

This WP C-3 report will also aim at providing recommendations for ports and other parts involved in the MoS concept, including policy makers, on how to improve its efficiency and increase its competitiveness by implementing the best practices and solutions from existing European clusters. Such insight will presumably offer an input into the ongoing developments and research related to the MoS concept and will provide another dimension to related StratMoS demonstration projects. It can also be used as inspiration for the policy makers in municipal and regional authorities on how to improve the settings for clusters development with the aim of shifting cargo off the roadways and onto more environmental friendly transport solutions, like sea transport.

2.2 Research Approach

The WP C-3 report is based on several sources of current information and interviewes with key actors in government, the transport industry and with port officials. The information sources include:

- Latest literature on cluster-based theory and thinking
- Examination of two MoS routes in the North Sea Region (Esbjerg-Zeebrugge & Sassnitz-Trelleborg) which will assist in identifying success factors as well as potential problems
- Discussions and interviews with industry representatives about how to improve communication and efficiency of current supply chains
- Review and analysis of the role port authorities could play based on the cluster approach
- Peer review assessments
- Workshop meeting where results are discussed, analysed and further assessed



The above mentioned methods contribute to a well-rounded and thorough report basis. The foundation is provided by background literature and previously conducted research, which in turn is developed further by engaging with key actors working in the field of cluster development, government and the transport and logistics industry. Workshops and attended conferences have added to valuable insights for this report and have also been seen as a way to promote the StratMoS project to outside partners and the general public.

Expert interviews were once again used in this report to provide direct inputs about the issues at hand. The interviewees, from a variety of sources, provided useful inside knowledge into their own industry and position on SSS and MoS issues. The information from these interviews are generalised which allows us to balance their inputs with the previously conducted work and research. In this way, several sources of information are combined and support one-another to contribute some meaningful and more precise results, enabling us to answer the main research question. Interviews were conducted with both cluster organisations and key stakeholders connected to the four MoS ports we examined – Esbjerg, Zeebrugge, Trelleborg and Sassnitz.

Interview guidelines were created beforehand for all interviews, based on the industry they represented, i.e. one for regional authorities, one for ports, one for cluster organisations, etc. The interview guidelines were created in conjunction with C-3 partners. The interviews were conducted as semi-structured, leaving room for additional and important topics to also be discussed. Some of the inputs into this report have also been made via an open discussion forum, which was held in Esbjerg on March 2nd, 2010. At this MoS meeting for the Esbjerg-Zeebrugge MoS project, top officials from the ports, governments and the TEN-T Executive Agency were assembled and this gave the StratMoS representatives an opportunity to develop a better understanding of the dynamics of the project and pose questions directly to the people who have been involved with the project from the start.

Furthermore this report takes into consideration cluster case studies. In order to choose the relevant case studies, such factors as critical mass, the meaning for the regional development and the geographic conditions have been considered. On the basis of conducted pre-research study we have chosen four case studies: in Germany, Sweden, UK and Denmark. After providing the cluster



theory and analysing the case studies the key success factors have been withdrawn. However, taking into account the MoS environment, when providing the key success factors we have looked at them from the angle of MoS, to make it relevant for this report. In Chapter Six, we have put it all together in so-called matrix, showing the possible interrelations between clusters development and MoS under the headlines: Structured Aspects, Business Development Aspects, Managerial Aspects and Financial Aspects.

2.2.1 Key Actors represented in this report

In order to carry out the research for the WP C-3 report there were several key actors who were contacted and who provided input into the report. These key actors and how they are represented are presented below.

- Port Authorities (Interview were made with port officials at the four MoS ports studied (Esbjerg, Zeebrugge, Sassnitz and Trelleborg))
- Terminal operators/Transport and Logistics Centres (support for this report was given by the Association of Danish Transport and Logistics Centres (FDT))
- Government Authorities (Regional Authorities, Road Directorate, Ministries, etc.) (Interviews were conducted with regional authorities in Denmark, Belgium/Flanders, Germany and Sweden)
- Maritime Associations (The Maritime Development Centre of Europe provided inputs and hosted a conference on SSS which was attended by writers of this report)
- Research Institutions (inputs were given from research institutions in Germany and Denmark)
- Innovation Networks/Clusters (Interviews were conducted with two regional cluster organisations, plus case studies were conducted into several other industrial clusters)

2.2.2 Limitations of this report

The report aims to explore possibilities to strengthen the MoS concept and the cooperation between actors. With the help of this report, the intention is to increase the awareness of port authorities, Transport and Logistics Centres, shipping lines and policy makers about the benefits of cooperation in the form of clustering. Furthermore, we limit ourselves in concentrating on a few North Sea



Region countries when analysing the business clusters and the national business policies. Due to the time pressure, FDT team conducted pre-research and chose four cluster case-studies to explore and learn from. The criteria used in the recruitment process were based particularly on the results which companies involved in clustering achieved, both financial (being financed by special programmes, development of the company, becoming more innovative) as well as socio-cultural (meaning for the region, increasing its attractiveness, opening new job positions, etc.).

Moreover, the decision of choosing the analysis of clusters form various industries, creates the necessity to provide the prerequisites for transferring the results to transport and logistics. Nevertheless, the practice of analysed business clusters shows the way to use the potential which geographic concentration and well-conducted management brings. From this fact, the MoS concept also posses huge potential, which not only can, but also should be exploited and developed further. Thereby, challenging the current MoS concept and suggesting ways to strengthen the MoS concept in order to develop MoS hubs and hinterlands.



3 MoS Concept & Port Cooperation – Challenges & Perspectives

3.1 Motorways of the Sea

Chapter Summary

This chapter will.....

- Review some of the latest material on the MoS concept
- Discuss MoS and port networks and clusters

As stated in all of the Work Package C reports the main objective of Motorways of the Sea is to reduce road congestion and at the same time improve access to peripheral and island regions as well as between Member States. This should be done by concentrating freight flows on sea-based logistical routes. Aiming at an increase of cargo flows on maritime routes should be followed by the development of ports and better hinterland infrastructure, thus improving connectivity along the door-to-door transport chain.

Nowadays, in respect to the challenging logistical situation in the European Union, the European Commission highlights the importance of maritime transport and its role for international trade. Compared to the road-only alternative, sea-based transport routes focusing on combining maritime and rail-based transports in an effective way, can open up for new more efficient and sustainable transport routes, as the capacity on open waters are many times higher than on the road networks, although environmental restrictions still apply.

To open up for these possible improvements, the European Community has established different financial schemes for priority projects, e.g. TEN-T, which can support the development of road, railway and inland waterway infrastructure connections to the seaports as well as port infrastructure, or Marco Polo funding, which mainly is meant as a support to businesses, when starting up new transport routes. The support can help co-finance up to 35% of staff costs, equipment costs, investment costs and up to 20% of ancillary infrastructure. Additionally the EIB and different structural funds have a pool of funds allocated for possible support to MoS schemes. In order to start up new successful sea-based routes, these funding schemes are crucial and will have notable impact on the establishment of the MoS routes. At the present stage, five different actions can be



subsidised (model shift actions, common learning actions, MoS actions, traffic avoidance actions and catalyst actions). Unfortunately the concept of MoS has thus far not been a complete success. (de Oliveira, 2009) Only a limited number of projects have been good enough to receive funding (four projects red.) and the MoS development actions can still be considered as insufficient compared to the potential that these sea-based transport routes possess (de Oliveira, 2009). As a reaction to the limited number of successful projects the EC has established an electronic help-desk for applicants. This help-desk gathers the available information in one place, making it easier for the applicants to find information about the calculations and analyses acquired when applying for funding to support new MoS routes. The help-desk can be found on this homepage: www.mos-helpdesk.eu/. In addition, the StratMoS project has provided a tool box for (potential) applicants for MoS funding, which is designed to make it easier to meet the application requirements. The toolbox can be viewed at www.vsl.tu-harburg.de/stratmos/.

Concerning the upcoming TEN-T MoS call, to be expected for May - June 2010 the TEN-T Executive Agency (TEN-TEA) has announced that the requirements towards the maritime operators will be softened. Under the new call it will furthermore be possible to introduce demonstration projects (pilot projects) at 50% co financing - an idea which is strongly supported by the StratMoS partners.

In order to establish a successful transport chain, the development of good hinterland connections is recognised as a main factor for success. With regard to the European Union, the priority has been given to the connections of ports – railways / inland waterways – hinterland terminals and Dry Ports. The networking of Logistic Centres of e.g. North Sea, Baltic and Atlantic ports with railway connections will have a positive effect on the development of hinterland connection.

3.2 MoS and port networks

Currently, 11 ports operate almost 70 % of the world's freight flow. Seen from a StratMoS point of view, it is of vital importance that the MoS concept should also contribute to the facilitation of medium and smaller sized ports becoming part of smaller or larger port networks. These large ports concentrate world trade in a few nodal points, thus pushing in a direction of economy of scale, where the payload on the vessels is increased. The concentration of freight has both positive and



negative results. To name a few positive outcomes, this centralisation secures that the activity in these large ports remains high and that the investments costs have a faster payback time. The large concentration then has the negative effect that the surrounding infrastructure is under an enormous pressure.

As described in the StratMoS report *“Identifying and analysing the characteristics of complementary ports”* a number of benefits can be achieved if the ports manages to cooperate in port networks, involving smaller, medium and larger ports and hereby developing and supporting smaller transport hubs that cooperates with the largest ports both when it comes to logistics planning and knowledge sharing. It is therefore important to focus on the benefits that smaller and medium sized ports can bring into a network cooperation, in which SSS routes operates in hub and spoke systems, where shipping routes from smaller hubs and of shorter distances helps in consolidating the goods in larger hubs, before the so called “great liners” makes the transport across the Atlantic Ocean or to the Far East. This distribution network should be structured so feeder shipping comes into focus, instead of the “great liners” doing the transshipment directly to trucks in the largest hubs. The concept, a form of - ship to ship or train to ship should minimize the number of road transports by focusing on feeder shipping and the benefits SSS can bring into the distribution intermodal network - a type of formalised network, which greatly relies on communication and consolidation in smaller hubs with the support from the largest players on the goods transport routes.

An example of this kind of cooperation can be found in Port of Hamburg where Port of Lübeck functions as a distribution hub for the goods to the Baltic Sea. With more than 150 ships arriving and departing every week efficient links are provided for combined transports between the continents industrial centres in central Europe and those located in Sweden, Finland, Russia and the Baltic States. (Logistics Portal Lübeck 2010) Trains carry the transhipped goods between Hamburg and Lübeck at high frequency, whereby this ”Baltic Bridge” can reduce transport times for the Baltic region by up to 50 % (Port of Hamburg Marketing, 2010) These high frequent goods trains between Hamburg Port and Lübeck Port keep goods off the roads.

An important aspect in making this scenario work is that ports acknowledge their role in the hub and spoke system, meaning that smaller and medium sized ports should specialise on certain types of trade and hereby maximise the results of investments, whilst not focusing on attracting larger



ocean going vessels, which the port and the companies in its surrounding hinterland, barely would have the chance to load 100 %. Instead feeder services established in cooperation with a larger port could be the way forward. For this to be a success it is important that companies in the ports hinterland support the idea, and for that to become a success these companies could join into a formalised network consisting of authorities, businessmen, freight forwarders, port managers, politicians, planners, pilots, road hauliers, ship owners, shippers, terminal operators, etc. Such a network should where possible find a branch that is characteristic for the port area and its hinterland. Hereby all actors pull in the same direction and have a united idea about the direction for further development.

There are no limits for how large the hinterland is, but if the hinterland includes more ports, these ports should also be invited to join the network, thus enabling the ports to cooperate and compete at the same time in a form of “co-opetition” – meaning cooperating and competing at the same time. This will also secure a division of which hinterland areas to serve, between two or more ports. There are several examples of firms who both cooperate and compete at the same time. These will be further explored in the next section, when several cluster cases are explored.

3.3 MoS and clusters

In his annual activity report 2008-2009 de Oliveira mentions five elements for port efficiency:

- Good infrastructure in the port
- Sound hinterland connections
- Excellent procedures
- Perfect integration of the information services and
- Well trained staff

All of these elements are indeed very important for a well functioning port with efficient working hinterland connections. One of the aspects that de Oliveira doesn't emphasize in his report is the possible benefits of regional based company support to the port. A strong support to the port from the proximate companies gives a stronger joint approach for developing the port economies of scope and economies of scale as well as it could secure more perspectives for upcoming investments in the port if these investments are supported by the local companies.



With the above mentioned scenario of cluster in mind, the following chapter will investigate European clusters and analyse how positive experiences from these, possible can be transferred to support the MoS concept, thus creating more local support to new MoS routes and therefore making it easier to reach the threshold of at least 200 million tkm shifted on average (per year per contract) or stated in eg. the MP II call for proposal documents. An enhanced focus on how a new shipping route could support a whole region would also increase the opportunity for new SSS routes to emerge, both with or without subsidies from EU or the EIB.



4 The Cluster Concept and Clusters

Chapter Summary

This chapter will.....

- Examine the concept of clusters
- Explore four industrial clusters and how they work and discuss the successes and challenges they are facing

According to the purpose of the WP C3, the MoS concept will be perceived through the angle of clustering. Thereby this chapter provides the reader with the necessary information to find not only the comparisons between ports and clusters, but further to increase awareness of the benefits of clustering. It provides the best practice examples, which increases the effectiveness of businesses and finally applies the lessons to be learned to improving the current cooperation among ports, their hinterlands, Transport and Logistics Centres, rails and other actors involved in the MoS. Furthermore, practice has shown that the concept of industry clusters supports achievement of a

variety of economic development goals and it promotes the region more effectively than other marketing efforts taken by the regional or national authorities. Thereby, this chapter also conveys the message to the policy makers, mainly on the regional level, to utilize the knowledge about clustering and to take actions in the pursuit of promoting and strengthening the clustering efforts in the region.

Along with the above, this chapter will provide an overview of the cluster concept to increase the understanding of this phenomenon. Furthermore, specific European clusters located in the North Sea region, will be analyzed to elicit the key success factors. Broadening the scope of interests by taking into considerations clusters from various industries (biotechnology, seafood, food, ventilation, flowers) allows us to collect a wider range of factors contributing to the final success of clustering efforts.

The cluster concept, first formulated by the professor Michel, E. Porter, has become more popular in recent years. This popularity is mainly due to two things. Firstly, the conducted research as well as the experiences of both entities and countries indicates that clusters are the aggregation of highly innovative and competitive business activities, on which the development of the local and regional



economies is based. Secondly, the involvement of public institutions, such as e.g. the European Union, and the issue of the programmes financed by the public funds, which support the process of clustering, make it attractive for entities and institutions to participate. The economy can be seen as a system. However, clusters within such system can generate stronger stimuli for development and innovation than single entities competing with each other.

Economists have identified clusters as a critical element in shaping competition between countries, regions and industries. There are many advantages to belonging to a cluster, and these are identified as:

1. better access to competent people and innovative ideas;
2. better access to specialized suppliers and demanding customers;
3. better access to research and development; leading to lower costs of doing business; and
4. better access to venture capital and competent investors

According to McKinsey & Co. *“For most global businesses the days of flat-out predatory competition are over (...) In place of predation, many multinational companies are learning that they must collaborate to compete².”* It is one of the reason why companies find it of the highest importance to cooperate with each other. In particular nowadays, we are witnessing a high interest in the concepts of cooperation and partnerships, such as strategic alliances, etc. It has become a core issue for researches and academic institutions, who perceive cooperation as the most critical factor in obtaining competitive advantages. However, those institutions, along with the government authorities, not only create the knowledge, but cooperate with the business entities in the pursuit of the innovation and competitiveness. One way of such successful cooperation can be seen in the form of clusters.

4.1 Review of the clusters definitions

The concept of clusters has drawn the attention of many scholars and it shows promise as a set of tools to assist with managing and economic development strategies. Even with such a high level of

² www.mckinseyquarterly.com



interest in clusters, there is no one definition of clusters, though a review of the existing definitions³ of clusters does allow for a few main characteristics of this phenomenon to be found, such as:

- Geographic concentration of entities in a specific location;
- Usually sectoral specialization;
- Various connection between the actors – vertical (e.g. in a value chain), and horizontal;
- Strong cooperation between actors;
- Support and cooperation with the academic institutions and government;
- Collection of decent numbers of workplaces;
- Changes of workflow;
- Possible benefits through achievement of economies of scale;
- Subject of research for scholars;
- Importance of clusters for the development of national and regional economy;
- Clusters as the centric of innovation;
- Increase of efficiency;
- Existence of tacit knowledge; information flow, better communication among entities in specific cluster, technological externalities; and
- It can cause entry barriers for companies outside clusters⁴

Furthermore, the concept and definition of clusters has its roots in the geographic distribution of employment. Porter (2000) noticed that by looking at these characteristics it was possible to identify three types of industries with very different geographic profiles. These include:

- Local industries, which aim to serve local markets, not necessarily focused on competing across the country, or even regions. The density of such industry is equal in the different parts of the country. This type of industry can be represented by e.g. local retail or other local services. They have lower wages and productivity, as well as the lower rates of innovation than in the national economy. On the basis of the conducted research, this segment account for 56% of European employment.
- Traded-cluster industries are usually concentrated in some specific geographical areas, since the industries has the free will and choice where to locate and serve markets across regions.

³ Örjan Sölvell, "Clusters Balancing Evolutionary and Constructive Forces" 2009

⁴ Clusters in the EU-10 new member countries; C. Ketels, , Ö. Sölvell



In comparison to the national economy, such industries have higher productivity, innovation rates as well as average wages. They account for around 37% of European employment.

- Natural resource-based industries are concentrated geographically, however the choice of location depends on the place where the natural resources take place. It has been estimated that they account for circa 5% of the employment in Europe.

4.2 Clusters form

In the available literature various forms of clustering can be identified. Additionally, one of the main motives for researchers to explore the concept of clusters is to prepare complex typology of them. Unfortunately, the trials to classify those phenomena do not fully embrace the complexity of them. However, on the basis of the both empirical and theoretical studies, it is possible to indicate few most important and most popular classifications.

Typology of the British Department of Trade and Industry (DTI 2001):

Added-value chain – the most important in such cluster are companies, which are connected with each other through the value-chain. The connections between entities are mainly vertical (in the production processes)

Aggregation of the connected sectors – this type of cluster, firstly defined by Porter, is consisted of four basic parts: segment of the final goods production, machinery and tools production, segment of specialized labour and other resources and the segment of supporting services

Regional clusters - aggregation of connected sectors, spatially concentrated, which conditions its global competition

Industrial districts - local concentration of small and medium-sized enterprises specialized in various stages of the production processes, strongly linked to the local environment, based on trust and cooperative ties.



Network - a specific form of the partnership between economic entities based on interdependencies, cooperation, and trust (which may be or may be not spatially concentrated)

Innovative environment - synergy of economic and institutional factors in the areas of the concentrated high-technology industries, which leads to the creation of effective and efficient diffusion of knowledge and the learning process

Meyer-Stamer's Typology:

Cluster related to the Italian industrial districts – exemplified by the famous American Silicon Valley. This type of cluster is mainly characterized by the dominance of small and medium-sized enterprises (SMEs), as well as high specialization, and strong competition, while at the same time functioning of the strong network connection, which is based primarily on trust. These factors, among others allow flexible specialization, high productivity, and creates potential for innovation;

Hub-and-Spoke cluster - characterized by coexistence of large local companies connected hierarchically with an extensive group of SMEs (e.g. Seattle - Boeing and Toyota City). Such type of cluster is based mainly on the strength of big local corporations, which at the same time can be characterized with the help which flexibility and use of cost advantages can bring;

Satellite cluster - with a dominant share of the SME sector enterprises are dependent on external companies. Its location advantage is mainly based on the lower cost (e.g. Research Triangle Park in North Carolina, the region of Manaus, Brazil.)⁵

4.3 Clusters to enhance innovation

In the pursuit of competitive advantages, innovation in the broadest sense becomes a topic of prime concern⁶. Recently conducted research indicates that it is not the company itself, but the industrial conditions in which the companies operate, may be more conducive for innovation. Furthermore, the scholars claim as the localized innovation processes are driven by the pressures provided by

⁵ www.klastry.pl

⁶ M. Bengtsson, O. Sovell, "Climate of competition, clusters and innovative performance", p. 226

competition as well as synergies arising from cooperating⁷. The dimensions that characterize the industry competition include the traditional structural ones, such as: the number, size and distribution of firms, symmetry, product differentiation, and vertical integration. To this list the theoretical founders of the localized innovation processes add the spatial dimension to competition. Based on the experience of IT industry in Silicon Valley, it can be learned that the intensity and quality of competition is enhanced by the proximity of competitors. Furthermore, according to Porter's (2000) development of the more dynamic competitive situation is achieved by the interplay among geographically proximate competitors who operate under the same cultural conditions and who speak the same language. Additionally, he found that psychological factors, e.g. pride and prestige to play an important role both in developing competition and encouraging companies to shift into innovative solutions. Thereby the relationships between companies, their suppliers, customers, academic institution, government and other entities, should not be neglected. The below picture depicts the various dimensions, which, according to Bengtsson and Solvell (2004), play the crucial role in the development of innovative processes. It depicts that the innovation process, including the innovative performance, is a complex phenomenon, which needs to be explained with the help of multifarious factors.

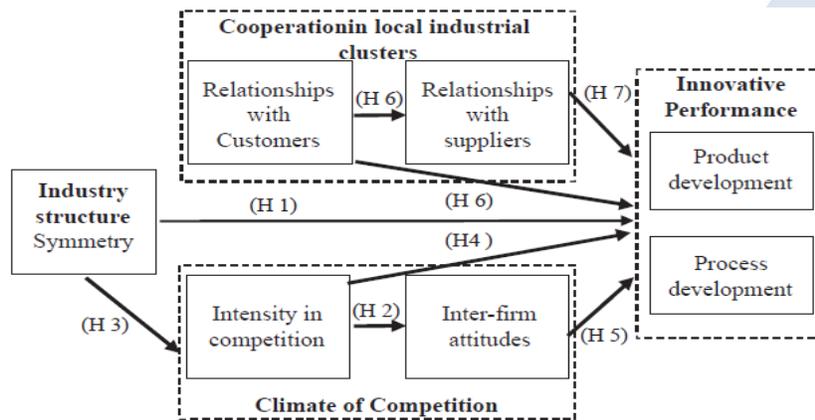


Figure 3: Factors influencing the innovative performance in clusters
Source: Bengsten, Solvell, p. 228

On the basis of the conducted research, Bengsten and Solvell (2004), concluded that the symmetry of industry is negative for product development, but positive for process development. On the other hand, intense competition occurs when the competitors are similar to each other. A high degree of

⁷ IBID,p. 226



intensity of competition, however, has the negative impact on the inter-firm attitudes (they can become hostile). Furthermore, the intensity of competition is negatively related to process development, not influencing actually the development of product. Regarding the climate of competition, it has been discovered as the hostile one is positive for innovation.

Relationships with both suppliers and customers play an important role for innovation performance. Although the research proved that the good relationships with customers contribute to the development of product, when relationships with suppliers have the bigger impact on the process development.

Why is one cluster more successful than another in less advantaged regions? Even with market conditions constant, some clusters fare better because they are able to innovate and develop new comparative advantages and/or because they have the foresight to shift their competencies to new markets. Rosabeth Moss Kantor (Rosenfeld 2002) has attributed economic success to three factors: concepts, connections, and competencies.

Cluster approaches help the development of common visions to guide the launch of certain actions or to achieve common goals.

4.4 The Cluster Lifecycle

Clusters have life cycles, which progress from an:

- Embryonic stage, which can be generated by innovations, inventions, or inward investment; to
- Growth stage, where markets have developed sufficiently to spin off and attract new players and competitors in order to stimulate entrepreneurship, to
- Maturity, which is when the processes or services have become routine, more players enter the market, and costs become a key competitive advantage; to
- Decay, when the products become fully replaceable by lower cost or more effective substitutes.

The below figure depicts the whole life-cycle. Worth being noticed is that in specific cases the cluster can skip one or more stages and pass to another.

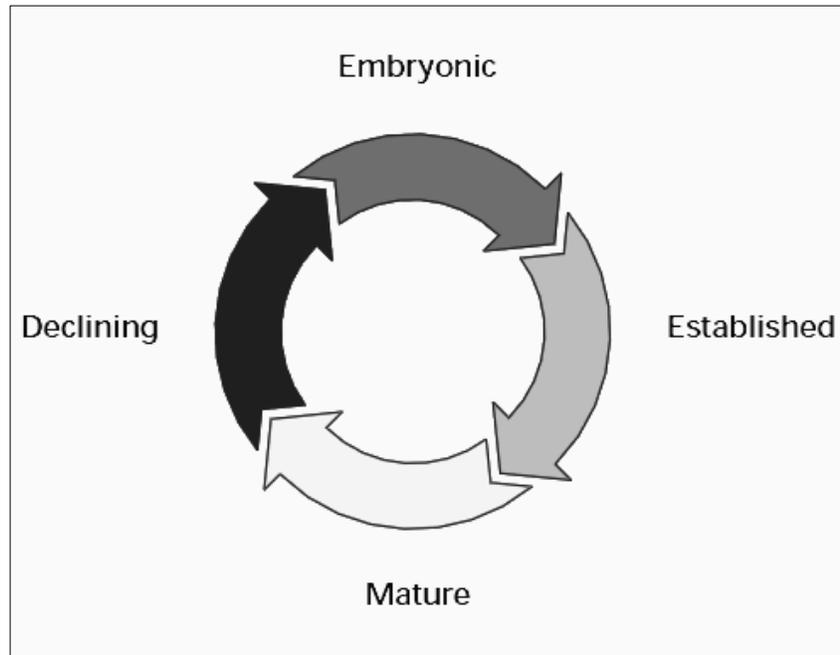


Figure 4: Cluster life cycle
Source: A practical guide to cluster development, TCI

4.5 The Formation of Clusters

Certainly the formation of clusters is influenced by many factors, where the most important seem to be the geographical factors. They, in terms of the size of regional markets and transport (if transport or other costs, which are affected by location, outweigh the benefits of economies of scale, the motives of clustering will be low) and other location costs are important determinants of clusters⁸. Moreover, it should be noted that the geographical proximity has a positive effect on lowering transaction costs, e.g. in terms of finding appropriate inputs such as labour and supporting services. As mentioned above, it can also lead to benefits from the concentration of technological expertise and knowledge, encouraged by clustering.

⁸ F. McDonald, G. Vertova, 2001, Geographical concentration and competitiveness in the European Union, p. 158



The second set of factors influencing the clustering process, according to McDonald and Vertova (2001), needs to be searched within the historical events. This is due to the fact that the attraction of a location is undoubtedly conditioned by the past events. A good example is the choice of place by companies in famous Silicon Valley, where the development of clusters had its roots in the presence and concentration of computer scientists.

To the other factors belongs the presence of institutional frameworks. In general such framework provides the structures which define the rules of human interaction. Those mentioned structure can be divided into formal and informal structures. Though familiarity with the structures and usage of them by the companies creating clusters, lead to diminishing of the transaction cost. It happens through the means of affecting the time, effort as well as uncertainties, which is strongly connected to the business activities.

On the other hand, it is difficult to precisely determine which factors are prerequisites for cluster development and which are appearing as a result of the clustering process. Geographical proximity of markets and suppliers, existence of a pool of specialized labour, presence of input equipment, availability of specific natural resources and infrastructure, low-transaction costs due to geographic proximity among actors and access to information have been commonly cited as requirements for cluster creation (Gallo and Moehring, 2002). Inevitably, the combination of all this factors in some specific geographic area can encourage companies to open up the clusters. Furthermore, following Bellandi (1989), such specific combination of economies that are available from clusters leads firm to reap what are often called agglomeration economies⁹.

Successful examples of clusters derive from both which focus on producing “traditional products”, e.g. furniture, food, etc. (Northern Italy) as well as those involved in the innovative, high-tech solutions (e.g. Silicon Valley). In particular, it is visible that clustering can be seen as a good solution for SME's. As the response for the overwhelming globalization, SMEs need to meet new challenges. One of them is the possibility to transform them and increase competitiveness, the second is to use the benefits of synergy in order to overcome the size limitations. Government policies at the macro-level are working on creating frameworks to favour conditions for economic

⁹ F. McDonald, G. Vertova, 2001, Geographical concentration and competitiveness in the European Union, p. 160



activity, which in the next step is designed to increase the possibilities to further develop SMEs. Likewise, dynamic industrial clusters are said to be engines of value creation because they have higher growth and higher productivity.

Clusters also have a stronger potential for regeneration, since the formation of new business is easier than for those companies working in “isolation”. Therefore, clusters can better respond to a crisis and recover more rapidly, offering regeneration and new ideas to old business models. In terms of performance, the seaport cluster is defined as the value added generated by the cluster, and is shaped by the interrelationships between the structure of the cluster and its governance. Here, cluster structure refers to the agglomeration effects and the degree of internal cohesion and competition. Cluster governance relates to the mix of, and relations between, organizations and institutions that foster coordination and pursue projects that improve the cluster as a whole. The concept of the cluster groups provides the impetus for maritime leaders to create a more comprehensive and focused strategy for integrated port and logistics activities.

4.6 Seaport clusters

This below section will be devoted to the subject of ports clusters. First of all, seaports have been commonly said to be a form of clusters as they often involve the close approximation of similar firms who work to serve the sea shipping and related industries. That is due to the few reasons such as: they consist of significant amount of firms, which are connected with each other by the arrival of ships and transshipment of goods in seaports¹⁰.

However, what should be noticed is that the source of added value in such type of clusters is not the principle port activity, like e.g. cargo handling, but other supplementary activities; logistics, trade, manufacturing, etc. The possibility to indicate the so-called port cluster region is also significant. The port and port-related activities take place not only in the port-city, but also in the neighbourhood, in other regions around.

In the literature review for this report, there can be found some common definitions for port cluster activities, which are widely used to compare port clusters worldwide and includes such things as

¹⁰ Seaport Clusters, OECD, 2004



cargo handling and logistics services to name a few. Apart from many advantages, which port clusters provide, such as employment, importance for region, there are some obstacles, which create challenges for further development. Scholars say as within the decline of port's size, the internal competition is smaller. It certainly creates barriers for development and, as a result, for the creation of innovation. The reason behind such state-of-affair can be found in that scale economies are so significant that the minimum efficient size is so large, that causes the internal competition to be unstable¹¹. Solutions for that should not be sought in regulations, which actually can prevent monopoly pricing, though most often have negative effect on innovation performance. There is a field for policy makers to create internal competition, however it can bring the desirable effect under the conditions that firms can specialize.

Another issue which needs attention in regard to the seaports clusters is the regional's economic development. There are no doubts, as the performance of the port influences on the development of the region. Apart from the benefits it can have for companies cooperating within the clusters, though it can create some entrance barriers for other companies, for other economies activities with more growth potential. Thereby, there is an open field for discussion on how to improve the port performance and the regional development, as well as the synergy between both.

One of the most important problems which concern all clusters, including seaports, is the problem of **collective action**. Naturally, cooperation in the pursuit of common goals, which is one of the domains of clustering, could bring the benefits for all sites involved, however such beneficial cooperation sometimes does not develop on its own, spontaneously. For example, some other companies can use the cooperative efforts of other firms. Thereby, to the highest importance arises the necessity of creating the collective actions problems (CAP's) solutions. Undoubtedly, in some clusters one can find lots of collective actions problems. For each of them it is necessary to apply a specified solution, so-called collective action regime (CAR). Regime, in this meaning has no negative meaning, but rather can be associated with some form of collaborative agreement, which enables companies to overcome some obstacles in cooperation. The other problem is that those regimes are not always efficient. In some cases they can even extend the existing problem.

¹¹ Ibid. 2004



Cluster development is quite generally accepted as an important mechanism to improve competitiveness, and features in government white papers and policy documents as something that needs to be fostered; Cluster initiatives are mostly launched in the context of regional development policies, where they are often a means to an end rather than policy goals in themselves.

The type and contents of cluster policies varies considerably from country to country, including:

- Initiatives where cluster policy is about strengthening the ‘triple helix’ relationships¹². Some countries also consider Science Park and Incubator Development as cluster policy (for instance the UK Regional Development Agencies include this in their regional cluster strategies, Hungary, Latvia and Israel consider these green-field type of investments as the start of cluster development);
- A second type of cluster policy which focuses more narrowly on R&D cooperation between companies and between companies and research organisations; and
- A third type of cluster initiative which focuses on encouraging co-operation between companies, regardless whether this is about R&D, and either horizontally and/or vertically, thus strengthening the value chain in existing clusters

4.7 United Kingdom – case of Humber Seafood

The section below will be focused on the clustering efforts in the United Kingdom, with the specific consideration for the seafood industry. First of all, the location of the United Kingdom being surrounded by water surfaces provides huge potential for the development of the seafood industry and possibility to become one of the leading in the country as well as in the international arena. Furthermore, it is significant as 13 out of the top 20 food manufacturers in Europe are based in the UK (INNOVA 2008). Such state of affair has its picture in that as the British supermarkets lead Europe in developing new products and responding quickly to changing customer needs (INNOVA 2008). However, the innovation in convenience food is usually due to the retailers efforts, and at last it has been communicated downstream to processors. Thereby it is the retailers who show the

¹² Triple Helix Approach - Potential to Network Innovative Clusters in the Baltic Metropolises Regions Present State and Perspectives, 2008

direction, followed by the processors. The regional development agencies try to encourage the producers and processors to take a stronger, dominant role in driving innovation.



Figure 5: Map of the United Kingdom – focus on the Humber Region

The sea food industry is also facing comparable problems. That is the reason, for which in the last decade efforts have been put in place in order to make the transition from an industry dominated by catching and primary processing; manufacturing and marketing mainly white fish species; to a value added based processing industry, with a widening range of seafood and fish products¹³. Such

¹³ Humber Seafood Institute Facility, p. 2, report by Regeneration Director



a transition is one way of answering the needs of the customers and increasing overall efficiencies. Such transition makes sense given the current circumstances. Fish supplied in frozen form can be easily sourced from any place in the world at lower costs than European processors can do.

In particular it is recognized that the Humber region possesses the potential to become the leading English as well as European seafood producer. According to the data provided in the report on Humber Seafood Institute Facility:

- 80% of the frozen retail market is manufactured in the region.
- 50+% of the retail chilled sector is manufactured in the region.
- 60+% of the frozen foodservice sector is manufactured in the region.
- The largest concentration of cold storage in Europe, per capita head.
- Centre of the chilled pre-pack supply chain for seafood.
- Two major auction markets.

Furthermore, the seafood industry needs to constantly meet challenges of the new technological demand, including the need to tailor to the international competition, increased controls over fish stocks, and new quality standards for traceability. Due to the demanding environment, and the new challenges, the seafood industry is still developing and growing, both the large corporations as well as SMEs. In the Humber region, in 2008 The Humber Seafood Institute was launched as an effect of cooperation efforts between the public and private institutions. Specifically, the Humber Seafood Institute is a partnership between North East Lincolnshire Council, Yorkshire Forward and the European Regional Development Fund. The Humber Seafood Institute, a £5.7 million multi-funded facility that will support the seafood and seafood logistic companies enabling them to trial new and diverse products to compete in new markets.

The important role in the development of cluster efforts in Humber Region plays the regional Development Agency (RDA), called Yorkshire Forward. In the first place, as mentioned above they support the food processors and encourage them to take stronger role in the process of driving innovation, another called as catalyzing the innovation.



Before the clustering efforts, the main area covered by the Research and Development was the fishing and food processing. However, the support of the Yorkshire Forward flourished in the researching the other critical area for the success - logistics. Due to such initiative to life has come the Seafood Institute in Grimsby and the Logistics Institute at the University of Hull has been developed to cooperate more closely with the sea food industry.

Unfortunately, the national economic policies provide more support to the old structures, rather than promoting new innovations. In the British Seafood Industry, two large facilities were built with the extensive use of the public funds ten years ago. Their purpose was to handle fish in the ports of Hull and Grimsby. Moreover, most of the investment which had been made up till 2008 aimed in the development of port facilities. However, the future need is to perform a transition and thereby base the logistics and transport on the airports and fast land transportation. The report made by the Yorkshire Forward shows a shift to more innovative transport methods could make Europe the world leader in seafood processing in marketing (what has already happened in the cut flower market in Holland).

4.8 BioRN case - Germany

Germany has recently put more and more emphasis on the importance of clusters development for their nation. As a result, the Federal Ministry of Education and Research launched a competition for national clusters in 2007. The primary aim is to improve Germany's position in the technologically advanced nations, by becoming more innovative, to expand growth and employment. This mentioned competition was intended to be cyclical and the winners (five "excellent clusters") were supported by up to 200 million EUR over a period of five years in order to implement innovative ideas and concepts within clusters.

Furthermore, attention has been drawn to the tighter cooperation between academic institutions, including Research and Development, and the business environment, which aims at bringing the research results quickly and successfully into the market. In particular, the conditions settled by the close cooperation between companies, scientific institutions and policy-makers make it easier to successfully become more innovative and to shorten the time-to-market for innovative products, services, etc.



In the report produced by the Federal Ministry of Education and Research, it can be found that clusters offer a singular combination of success factors, such as:

- they offer scientific and practical support for upcoming scientists and provide attractive settings for teaching and continuing education;
- Long term research strategies;
- Technological development with a market focus;
- Favourable conditions for start-ups;
- Strategic expansion of international collaborations;¹⁴

The private and business investors need to also eagerly participate and financially support the implementation of the strategy, which needs to be focussed on providing innovative solutions to the market as well as promote innovativeness. Additionally, such strategy must be flexible in the meaning that it will be economically feasible to perform it.

The winners of the first competition were announced in September 2008, and the funding has been divided into two phases, the first at the commencement and the second, two years later, when the implementation of strategy will be verified. To the first winners belong such clusters as:

- BioRN – Der Biotechnologie-Cluster Zellbasierte & Molekulare Medizin in der Metropolregion Rhein-Neckar;
- Cool Silicon – Energy Efficiency Innovations from Silicon Saxony;
- Forum Organic Electronics;
- Luftfahrtcluster Metropolregion Hamburg;
- Solarvalley Mitteldeutschland;

The BioRN, being the largest chemical cluster in Germany, the third in the world, and the second in Europe, is situated in the industrial area of Rhein-Neckar. Significantly, the two winners of the TOP Cluster Competition derive from this region and thus make it a good region to explore. Rhein-

¹⁴ www.ideen-zuenden.de



Neckar Metropolitan Region is located at the south western part of Germany, between Frankfurt and Stuttgart. This area is well known in the area of scientific research (Heidelberg University and other 20 Universities) as well as one of the most important industrial centres with many innovative enterprises. Undoubtedly, such constructed settings are good for the further development of the clusters efforts.

This successful cluster brings together 70 Biotech SMEs, which accumulate around 1500 staff, additionally 4 global corporations, with total of 5500 staff in the biotechnology sector and 6 Universities and Research Centres, including widely recognizable Heidelberg University, where around 3000 Scientists work on the development of the biotechnology sector. In total 10.000 people join their forces for the further development of the cluster¹⁵. Significant, is the fact that they work in close proximity of 30 km from each other, what surely has the positive influence on the tightening the cooperation and the process of the knowledge exchange. According to Dr. Jurgen Schwiezer, Chief Executive Officer of the Roche Diagnostic Division, the cluster devotes its triumph partly to the excellent pioneering research being conducted in the Rhine-Neckar region as well as on the presence of the major corporations, being the global readers in the biotechnological industry, who joined forces such as: Roche, Merc, Sereno and Abbott. Furthermore, the other partner from Merc Serono find the strong network in the Rhine-Neckar Region as one of the crucial factors, that can lead to the achievement of the strategic goals¹⁶.

Worth being noticed is the structure of the cluster. There has been created a company that is taking care of the cluster management, coordination, integration, development as well as marketing and of the successful implementation of the innovative strategy and closer cooperation between involved parties, including business and scientific institutions. The **BioRN** Cluster Management GmbH is a public-private partnership between the Rhine-Neckar BioRegion, the Heidelberg Technology Park, the Rhine-Neckar Chamber of Commerce and the Rhine-Neckar Metropolitan Region¹⁷. The diagram below depicts the structure of the cluster with the primary role of the BioRN Cluster Management taking care of the joint actions.

¹⁵ Presentation of the Technologiepark Heidelberg from the 19.02.09, p. 10

¹⁶ Press release 2008:

http://biorn.org/index.php?id=86&tx_ttnews%255Bpointer%255D=3&cHash=6d870fa63d

¹⁷ <http://www.biorn.org/>, retrieved 24/09/09

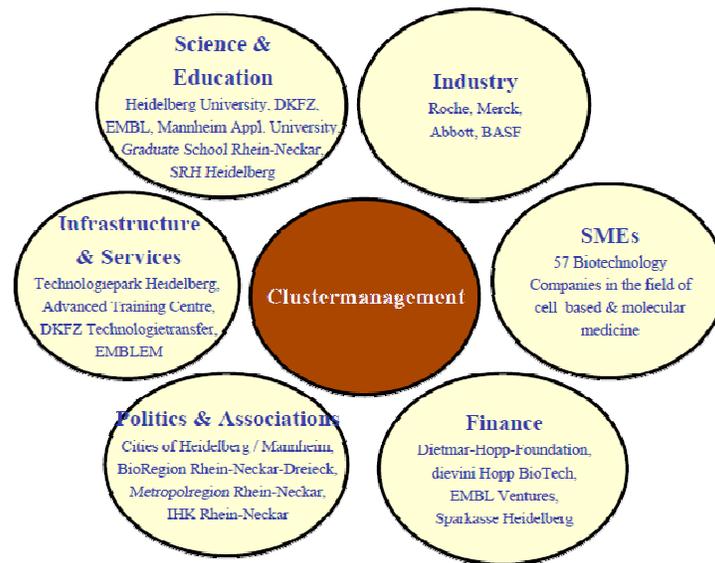


Figure 6: Actors involved in cluster management

Additionally in its vision the BioTechn states that they want to become the European leader in the biotechnological solutions. As a winner of the prestigious competition launched by the Federal Ministry of Education and Research it is supposed to implement strategies consisting of five strategic collaborative projects (including 36 small projects implemented by the twenty-four actors involved in the cluster) such as: The BioRN Academy, which purpose is to identify new talented life scientist and to provide them with the capabilities needed to take the top positions in the future; The BioRN Incubator which promotes the development of the drugs clinics; The BioRN Stem Cell Network, covers the projects which aim is to create the development of the stem cells; The BioRN Biomaker Center, which aims at developing the diagnostics and analytical techniques; The BioRN Cluster Management. The main objective of those 36 individual projects, under the frame of this collaborative undertaking, *is to drive innovations in biotechnology towards industrial maturity*¹⁸.

The cluster management is searching for the best solutions and practices in order to increase its competitiveness. First of all, they are investing into the youth capital and human resources, by enabling them the excellent conditions to study the biotechnology and to have the possibility to continue their career within the cluster. Furthermore, they promote their activities by hosting workshops and conferences, where the parties are informed about the progress in the research and

¹⁸ Collaborative projects of the Biotechnology Cluster Rhine-Neckar (BioRN) successfully launched



development area. They were the host in 2008 of the BIO-Europe, which has established itself as the world's largest and finest stand-alone partnering event for the biotechnology industry¹⁹. For a couple of days around 2300 industry attendees from 50 countries network with each other and performing presentations and workshops. Such events certainly promote the industry and increase its attractiveness.

In the presentation conducted by the Technology Park Heidelberg, which is highly involved into the cluster management, a few major factors, which contribute to the success of the Biotechnology Cluster, could be found. Apart from the strict and close cooperation between academia and business life practitioners, the dimension which should be highly considered is the dynamic development. In the years 1996-2000 the biotech patent application was at the level of 30. It has increased up to 72 in the recent years. It could be also explained by the growth of employment in cluster. In 2001 there were around 2000 people employed, who joined their forces to work on the clustering efforts. Nowadays, as written above, this number increased up till 10.000 employees. Furthermore, the management proved to be successful in their actions of finding the sponsors. During the years 2003-2007 up till 260 millions € VC were invested into the development.

4.9 The Øresund Case (DK)

Danish cluster activities go back to the early nineties. The Danish government adopted the cluster concept as one of the first countries in Europe and in the world. Analysis was conducted based on the mega clusters as building/construction, food products, bio-health, ICT etc. However, the mega clusters were too broadly defined to provide a focused and effective cluster policy. In the late 90's, the government turned the focus towards smaller clusters such as biotech, aluminium processing and industrial design while still maintaining the mega clusters. Currently, the cluster policy has low national priority due to cost savings measures. Although Danish national cluster policy is officially non-existing, national authorities indirectly support clusters and there has been a significant increase in activities over the past several years. Several programmes to promote regional initiatives or regional growth environments have been started in 2000 and are supported by the Ministry of Science, Technology and Development. The procedure runs similar to the Swedish Vinnväkst programme, but is less extensive. The goal of the environments is faster distribution of knowledge,

¹⁹ Roche, Merck Serono and Abbott join forces in Biotechnology Cluster Rhine-Neckar, November 17th 2008



faster innovations, implementation and job creation. Further, the purpose is to intensify and develop cooperation between the participating parties and to contribute to the development of lasting cooperative relationships and increased knowledge sharing between partners.

The highly innovative region around Copenhagen and the City of Malmö is called the Øresund Region. The Øresund region is understood not as two countries, but as a whole region. The organisation Øresund Science Region (ØSR) promotes integration across the borders of disciplines, academia, industry, the public sectors of Denmark and Sweden, the Øresund Region and other regions in the world. The European Cluster Observatory project has detected 28 clusters in Denmark (without differentiating them on lower geographical levels) and more than 35 in Sweden. Three of them are located in or around the City of Malmö (Sweden).

The ØSR's mission is to develop the Øresund Region into one of Europe's most attractive knowledge-based economic growth centres. Its pillars are the innovation platforms and projects. Following the Triple Helix approach²⁰, they create linkages and facilitate cooperation in identified core competencies. Platforms are established in the areas of life science, environment, ICT, food science, logistics, nano, digital entertainment and humanities. Medicon Valley Alliance (medico/biotech), Øresund IT Academy (ICT), Diginet Øresund (digital entertainment) and Nano Øresund (nanotechnology) are among the eight platforms that have been established since 1997 in the Øresund Science Region. The activities are aimed towards the development of an innovative environment and efficient commercialization structure, providing global branding and marketing of the Øresund Region as a high tech region, securing sustainable economic growth while maintaining a high ethical and humane standard. Other activities include matchmaking, benchmarking of members, enhancing research and education, innovation and technology transfer.

There are several organizations which promote the Øresund Region. Among them are Invest in Denmark; Invest in Sweden Agency; Ministry of Science, Technology and Innovation of Denmark; Copenhagen Capacity and Position Skåne. The region encloses fourteen universities. Some of them are both large and internationally highly ranked. All universities are linked together within the

²⁰ Triple Helix Approach - Potential to Network Innovative Clusters in the Baltic Metropolises Regions Present State and Perspectives, 2008, p. 37; Project supervisor: Prof. Dr. Jörg Sydow, Funded by TSB Innovationsagentur Berlin GmbH with financial support of Baltic Sea Region



umbrella organization Øresund University. The goal of the Øresund University is to increase cooperation between the universities within education and research as well as collaborations with business and industry in the region, local and regional authorities and other organisations in Øresund. A number of science parks (one of them is the largest in Europe) and incubators are located in the region. The Øresund Region is also home to high-tech multi-national companies. Astra Zeneca, Duni, Epsilon, Findus, Oriflame, Sony Ericsson, Tetra Pak and a large number of innovative small and medium enterprises all have their headquarters or research centres in the region. Numerous cluster development initiatives are currently active in the Øresund Region with the Baltic Sea Initiative (www.bdforum.org/show/english/the_forum.aspx) and Scanbalt (www.scanbalt.org/) among the most prominent.

The current vision of the ØSR is to make the Øresund Region visible as one of the most knowledgeable, technological advanced and dynamic regions in the world within the field of food.

The Øresund Region

Øresund region geographically comprises of Zealand, Lolland-Falster, Møn and Bornholm in Denmark as well as Scania (Skåne), the southern part of Sweden.

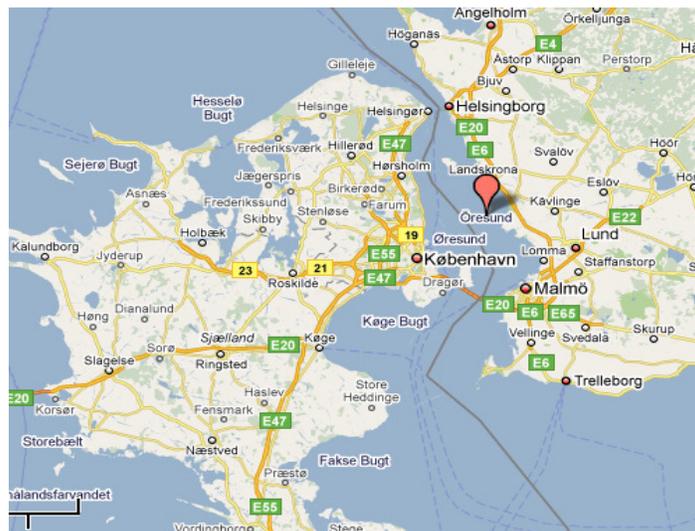


Figure 7: Øresund Region
Source: Google map

The region has 1/3 inhabitants on the Swedish side and 2/3 on the Danish side. Indeed, Øresund comprises:



- 3,6 million people,
- 12 universities,
- 150.000 students and 6.500 PhD students,
- 14.000 researches,
- 5 science parks, including IDEON/LUND, being one of the largest in Europe,
- 2 international airports/ 2 regional airports

Significant is also the fact that around 80% of Danish and Swedish inhabitants speak English. The Danish and Swedish Governments decide to create the innovative Science-Based region, called the Øresund Science Region. Thereby, primarily, the Science-based region is an outcome of political vision. The reason behind that is the lack of synergy, which was observed between research and industry across the Swedish-Danish border. The ØSR initiative therefore fosters the development of the cross-border region that commenced soon after the opening in 2000 of the bridge across the Øresund. The aim of the ØSR is to promote knowledge-based economic development in this cross-border region, as the creation and transfer of new knowledge to this society is one of the crucial competitive factors for the region's future economy. Furthermore, their goal is to bring together regional authorities, businesses and universities. The successful application of the "Triple-helix" approach, explores the cooperation among the universities, and other helixes, such as companies and policy makers. In particular in the developed countries universities are much more involved in the business life, and where the innovation is associated with the business based on the R&D activities.

The ØSR is a regional development project with innovation and research platforms and projects designed as tools to create links between authorities, industry and universities across the Swedish-Danish border in identified core competencies. The following seven platforms are part of ØSR:

- Medicon Valley Academy (health /pharmacy)
- Øresund IT Academy
- Øresund Environment Academy
- Øresund Food Network
- Øresund Logistics
- Diginet Øresund (digital entertainment)
- Nano Øresund

The below picture presents 7 innovation and research platforms:

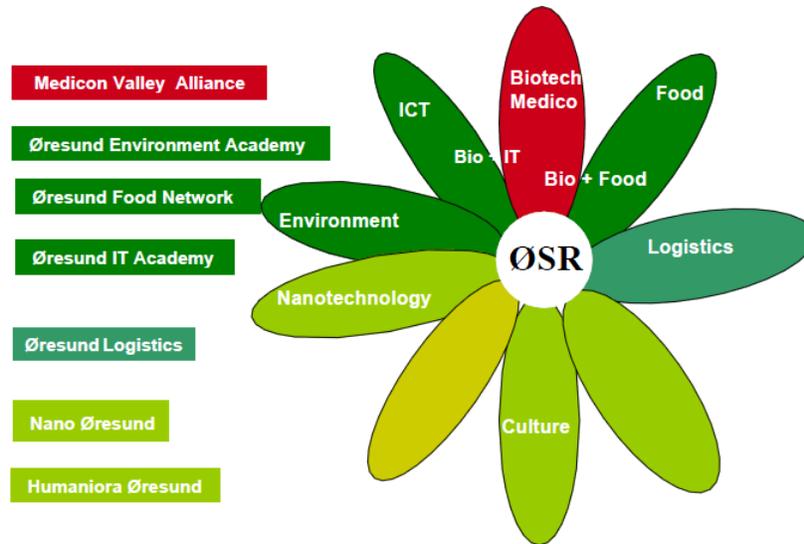


Figure 8: Clusters support and projects
Source: Presentation about Øresund, Maria Olafsdotter, 2008

Those platforms benefit from the synergies of overlapping interests. They collaborate with each other. As an umbrella initiative the ØSR supports those different, though overlapping, and development areas as well as it supports the flow of knowledge and collaboration across the platforms. Thereby the ØSR plays the managing role within the cluster.

The ØSR was the winner of the prestigious competition “RegioStars 2008”, promoting the regional innovative projects. There were four categories in two themes, the Regional Economies Based on Knowledge and Technological Innovation, and the Sustainable Economic Development, which indeed supports the development of the clustering efforts. ØSR won in the category Furthermore, they also have been supported by the Interreg IIIA.

The ØSR secretariat is financially and staffed as part of the Øresund University and serves as an umbrella organisation for the different thematic platforms, and as project manager and promoter of the ØSR at European and international level. The ØSR is managed by a board composed of university, enterprise and public authority representatives from the Danish and Swedish Øresund regions. Øresund Science Region and the platforms are financed by the region’s universities (combined in Øresund University), the Capital Region of Denmark, Region Skåne, the Danish



Ministry of Economic and Business Affairs, the Swedish Ministry of Enterprise, Energy and Communications, and a membership of more than 2500 companies. Two different programmes were financed by the ERDF / INTERREG in relation to the innovation strategy of the Øresund cross-border region. These are the "Øresund Science Region" project and "Medicon Valley". Many of the ØSR projects receive co-funding from other EU programmes, such as the 6th Research Framework Programme (FP6) and Marco Polo.

Due to its special qualities, the region is home for the various types of cluster, medical technologies and biotechnologies, information and communication technologies, optics, micro-systems and nanotechnologies. Though, they cooperate with each other, under the umbrella of the Øresund Science Region. Though, the food cluster is a central part of the science region and has many characteristics of the region in general. The food cluster puts a strong emphasis on R&D and on cooperation and interaction with other companies and institutions in the region. The characteristics of the food cluster in the Øresund region today are a result of the general transition of the food industry and the political strategy of the Danish and Swedish governments. The two governments have a vision of a Øresund region built on science-based knowledge and competencies, and supporting and developing the strengths of existing biotechnology and food industries.

This requires that the food industry is able to benefit from the high global growth rates of food products with special characteristics. Functional food is a central category of this type and it is a dominant element in the strategies of both food and biotechnology companies and the food cluster in general. In particular, the functional food has noted an increase in the popularity in the developed countries. In the light of the settings which have been drawn by the crisis, more and more companies are eager to invest in the research and development to develop food which brings extra health-beneficial effects. Significant is that, even though because of the crisis it has been noted decrease in the sale rate of the majority of food products line, the sale of the functional food has increased.

The food cluster in the Øresund region includes most of the important sectors of the food industry. In relation to functional food, biotechnology companies play a crucial role. They contribute key competencies to add characteristics and value to food products, allowing the food companies to



differentiate themselves from companies producing more generic products. For the fact it is rather advisable not to act in the social science.

The Food Industry in the Øresund Region called the Øresund Food Network, combines:

- 225.000 employees in the food industry, more than 400 companies in food sector
- 25-30% of the region total labour force is employed in food related industries (4% in food production)
- 4000 scientists, food technologists
- 3000 students in food science and related sciences
- Most added value pr. Employee in the food sector among EU food clusters
- Turnover in the core food industry in Denmark and Sweden is 80 billion Euro a year
- 70% of production is exported, equalling 48 billion Euro a year
- The region hosts all sectors of food industry²¹,
- The home of many successful companies, e.g. Danisco, Tetra Pak, Arla Foods, Lantmännen, Procordia

Øresund Food Network was established in autumn 1999, by the present food industry. Its mission is to increase contacts and exchange between academia, authorities and industry within the food area. The vision is to make the Øresund Region visible as one of the most knowledgeable, technological advanced and dynamic regions in the world within the field of food.

The SWOT analysis, below, of the Food Cluster supported by the ØSR. It is based on the analysis prepared by the CEO of Øresund Food Network, Mrs. Maria Olofsdotter.

SWOT Analysis – Øresund Clusters	
<p>Strengths:</p> <ul style="list-style-type: none"> - High Level of private RTD, especially in Danish Food Firms - High number of competent network and stakeholder organisations that have accumulated great experience and that support knowledge transfer - Innovative milieu around the city of Lund (Øresund SE) combining entrepreneurial spirit 	<p>Weaknesses:</p> <ul style="list-style-type: none"> - Poor involvement of SMEs in RTD. Collaboration between knowledge centres and industry is concentrated only on large food firms with strong research base. - Lack of in-house R&D oriented competences in firms. - Weak understanding between researchers and industry complicates joint projects. Need to find

²¹ Data from the presentation by Maria Olofsdotter, CEO, Øresund Food Network, November 2008,



<p>and a unique cross-disciplinary approach</p> <ul style="list-style-type: none"> - Increasing attention to cross-sectoral cooperation, e.g. functional food - “Food-Innovation at Interfaces” – in Øresund SE. And ongoing initiative that has developed the food cluster’s innovative capacities. - Strong and relevant food policies with focus on innovation is executed by Region Skåne, at Danish national level at a local level. Local policies of many countries and municipalities support of the food sector. 	<p>common understanding of sectorial problems and better understandings of each other’s agendas.</p> <ul style="list-style-type: none"> - Weak integration and cooperation between Sweden and Denmark on innovation. - Downward trend in private RTD-spending in Øresund SE. - Lack of joint cross-border regional policy. - Lack of regional funding sources for Øresund-projects involving both countries.
<p><u>Opportunities:</u></p> <ul style="list-style-type: none"> - Strong scientific base at present underutilized by food industry (World-class research, cross-disciplinary research areas) - Medicine and Biotech cluster show increased interest in cooperating with food cluster - EU legislation on health claims opens up new market opportunities. Combined with experience from a clear code of practice for health claims on functional foods in Sweden. - Good level of Danish public funding on RTD and forecasted increased budget to Swedish public food RTD - FINE consortium - Danish local government reform in 2007 (increased regional focus, new bodies for innovation/growth) - “Food Innovation at Interfaces” - important initiative on the Swedish side - Recent changes in DK funds for food related RTD-projects will permit use of granted money in international projects (so-called Law of Innovation) - Knowledge transfer and innovation systems are prioritised issues of Danish and Swedish government - Interreg IV programme 	<p><u>Threats:</u></p> <ul style="list-style-type: none"> - Few incentives for university researchers to engage in collaboration with the industry - Proposal that patent ownership is taken over by universities from researchers, in Sweden, In Denmark is already a fact - Food research tend to “fall between chairs” at national level in Sweden. The area is split between several research councils and ministries - Physical infrastructure for food innovation not enough developed in Øresund DK (science parks, incubators, innovation advisors)

The below diagram depicts three main areas of interest in the Øresund Food Network.



Øresund Food Network – NETWORK AND THINK TANKS				
HEALTH		PRODUCTIO N AND PROCESSING		GASTRONOMY AND CREATIVITY
INNOVATION FOR REGIONAL GROWTH				

The operation of the cluster – Øresund Food Network.

Research is focused on:

<u>Marketing:</u> Strategic Alliances Positioning through Food Innovation Network Europe (FINE)	<u>Development:</u> In-between-meals at hospitals The virtual food factory Bio-tech professions master House of food and sports	<u>Service:</u> Health claims Nordic /Baltic consensus (Nordic Innovation Centre) Innovation and innovation methodology
<u>Research:</u> Whole grain Better food in large scale DNA makers for healthier plants Foods in school Meat quality Phospholipids Gluten and foods Lossfree flexible products Starch Food at work		<u>Collaboration:</u> 15 networks in different area Healthy Growth (Reg. Hovedstaden) Unlimited health The virtual food factory Food clusters in Europe

Source: Presentation by Maria Olofsdotter, CEO, Øresund Food Network, November 2008

4.10 Swedish case - the Region of Stockholm

The concept of clusters was introduced in Sweden in the early 1990s. Since that time clusters have played an essential role in the market development and as well as being an issue of concern to politicians. Such situation made in recent years mean that more cluster programmes have appeared on the Swedish market as politicians pressured for more of them. Currently, new programmes can benefit from the achievements obtained so far, but still they cannot rely on one model of cluster policy.²²

There is not one single definition of what a cluster policy is, however, it general, it does include all the efforts made by governments for cooperative activities such as businesses and universities, which are aiming to develop the competitiveness of clusters. Cluster-based economic policies in

²² Ketels, C. 2009, "Clusters, Cluster Policy, and Swedish Competitiveness in the Global Economy"



Sweden are used in a broad sense and affect the basis conditions for the emergence of clusters and the structural clusters have been used as a tool to improve competitiveness of transnational cluster cooperation.²³

In Sweden transportation, construction and metal manufacturing sectors are the three major groups of clusters, which employ the greatest number of workers. All three are also recognized as having a lead position throughout Europe, taking into account the size of the country.²⁴ Despite a business environment and academic tradition of cluster policy development, Swedish economic policies have long been sceptical about using new policies. Nowadays, cluster policies are becoming more important and used by the Swedish government in a more structured and focused way. Cluster policies in Sweden are based on finding answers to the question of how to organize cluster efforts most effectively worldwide. The financing of the internationalization should be subject to the creation of a coherent strategy that will allow the knowledge and skills supplemented companies. Current programmes provide funding for the action of internationalization, but they also provide directions on how the actions should be incorporated into the overall strategy of the cluster²⁵.

Cluster policy in Sweden has been recognized as a visible policy but limited. The weaknesses are focused on strengthening internalization and relevant integration of regional and national agencies.

Lessons learned from Sweden

Policy cluster may be part of a policy which is focused on making it easier to become an entrepreneur as well as creating stronger incentives for the creation of new enterprises through educational programmes. These programmes provide information about the benefits than can be achieved by belonging to the cluster as well as a capacity to use the presence of new providers and their services.²⁶

In Sweden, the case of innovative capacity initiatives for R&D has been recognized on a high level. The relevant environment provides investments in developing foreign research hubs. A relatively small national economy, in connection with huge level of market segmentation across the borders of

²³ Ibid,

²⁴ Ibid,

²⁵ Ibid,

²⁶ Ibid,



Nordic/ Baltic Sea region is the main barrier for the development of clusters in Sweden. Despite the fact that EU Member States have removed barriers for trade and investments, administrative and regulation obstacles have still remained.²⁷

Universities have played an important role for many clusters as they can be used to facilitate regional cluster efforts and can be used as a tool to strengthen overall competitiveness. According to the Sweden Strategy, clusters at the regional level should be more important. The enterprises should be more open to join linkages between clusters. Regions should also create mechanism that can help to measure if clusters are beneficial. The question is if individual policies in the regions are sufficient to help Sweden remain a competitive country within the EU²⁸.

By 2001 a new cluster promoting initiative VINNOVA (which stands for Swedish Governmental Agency for Innovation System), was established. The area of interests of VINNOVA covers needs-driven R&D and strengthening the overall Swedish innovation system. More detailed, they are interested especially in improvement of the technology transfer as well as in improvement of SMEs capacity to engage in R&D (under the programme the “Forska och Vax”). VINNOVA as a part of its activities introduced the 10-years-lasting cluster programme “Vinnväxt” in 2003. It is a so-called competition in which clusters or public-private partnerships involving firms, universities and local authorities can receive ten years public funding, under the condition of cluster co-financing. In addition “VINN Excellence Centres” is a programme under which applied research centres throughout Sweden have received funding in different technological areas²⁹.

The eastern part of Sweden, around Stockholm, the capital of Sweden, is a leading economic region not only in Sweden, but also in Europe with a high concentration of information technology, health care industry and research. The vast number of international corporations and SMEs makes this region very competitive, especially because many of those businesses are science and technology-based companies. Furthermore, about twenty universities and university colleges are located in the Stockholm region, with a variety of diversified disciplines, which supports the idea of innovation.

²⁷ Ibid,

²⁸ Ibid,

²⁹ Ketels and Sölvell 2006



Figure 9: Map of Sweden

Taking the above into account, it is no surprise that the Stockholm region remains high in rankings in the field of the international innovation, creativity and competitiveness.

Stockholm Region has also become an important hub in the expanding Baltic region, as well as is an integral part of the growing EU market. Additionally, worth being noticed is a large number of national and regional R&D institutes and private initiatives in this specific area, and many of them cluster around the Royal Institute of Technology and Electrum in Kista. Those research institutes play a vital role in the Swedish economy, because from one side they closely cooperate with the Swedish companies on R&D projects and from the other, they also put much emphasis on facilitating and fostering start-ups and spinning-off new firms³⁰. Recently a comprehensive consolidation has taken place among the local industry research institutes. Many of the institutes are now under the umbrella of RISE Research Institutes of Sweden Holding AB. It is a government-owned company that partly or wholly owns industry research institutes. RISE Research Institutes of Sweden is a network of RTO's, cooperating with universities, industry and society to create value, economic growth and

³⁰ <http://www.clusterobservatory.eu/library/100142.pdf>

competitiveness through excellent R&D and Innovation. At the holding company their core process concerns the corporate governance. Their mission is, with the help of the strategic governance, develop and renew the sector into a sustainable world class institute sector and thereby attain their main aim, which is to increase the competitiveness of trade and industry and Sweden's growth³¹.

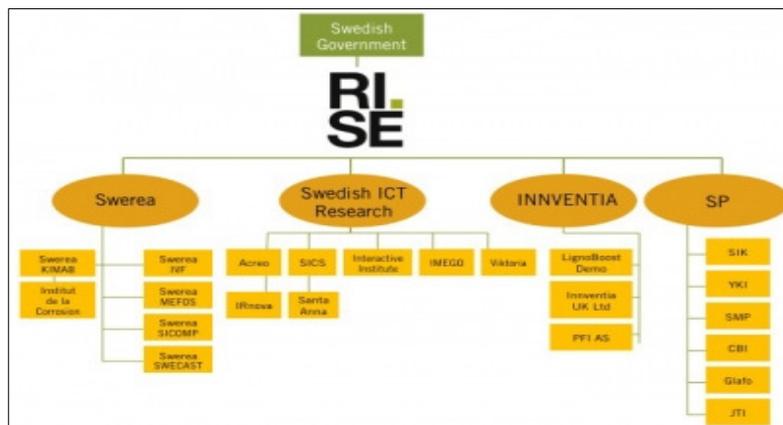


Figure 10: Structure of RISE network

Within the Stockholm region four competitive clusters have been identified by local authorities: IT & telecom, life sciences, financial services and environmental technology. On the one hand local policy makers presently strive to find a coherent innovation strategy based on the triple helix model, i.e. cooperation between industry, academia and public policy. On the other hand Stockholm Innovation & Growth (STING) is an established comprehensive and qualified support system for stimulating the foundation and growth of new companies focusing on ICT, Telecommunication and recently also medical technology in Stockholm. The European cluster observatory identifies eight agglomerations in the Stockholm region in the areas of finance, business services, transportation, IT, education, entertainment, communication, Biopharma

Life Sciences in the Stockholm Region

The main statistics:

- Approx. 460 companies (with approx. 26 000 employees total)
- 88 Life Science Investment in 2008 to a value of 530 million SEK (57% of life science investments in Sweden)
- Six universities active in biotechnology research in the region (approx. 28 000 students and 4 400 professors and other researchers)

³¹ Rise webpage: <http://www.ri.se/en/>



*The Life science cluster in Stockholm is characterized by **world-leading** basic and applied science and commercial companies active along the entire **value chain** from **small biotech start-ups to big pharma** with both production capacities and marketing. Within basic and applied, clinical research the following areas are particularly strong: neuroscience, oncology, infectious diseases, immunology, circulation and respiration, metabolic diseases, regenerative medicine, tissue engineering and stem cell research. Many companies are active within these fields but there are also companies within diagnostics, medical technology and biotech tools and supplies. The region has also a broad representation of service companies ranging from early drug discovery and development to clinical research organizations.*³²

The greater Stockholm region (including Uppsala, Södertälje and Strängnäs) dominates the Swedish life science sector and also holds a strong position in Europe. It is noticeable as more than half of Sweden's biotechnology companies are located in the greater Stockholm region. Companies like AstraZeneca, Pfizer, Biovitrum, GE Healthcare and Siemens Elema are located in the region. The products which they produce are not only examples of leading biomedical and biotech research but also examples of effective technology transfer performed in an entrepreneurial interaction between academia and industry. Also large production facilities are located in the Stockholm region as well as a large number of international pharmaceutical companies i.e. Amgen, Bristol-Myers Squibb AB, CSL Pharma, Eisai, IVAX Scandinavia AB, Johnson & Johnson, Merck AB, etc.

Considering the research environment, there are six universities within life science in Stockholm that cooperate with the companies (Karolinska Institutet (KI); The Royal Institute of Technology (KTH); Stockholm University; Södertörns University College; Uppsala University; Swedish University of Agricultural Sciences). Karolinska Institutet is one of the largest medical universities in Europe and ranked fourth worldwide among medical universities after Harvard, Cambridge and Oxford.

All the activities, such as: basic research, target validation, clinical testing, pharmaceutical production as well as sales, which indeed create value in the chain, are present and located in the

³² Source: Stockholm Business Region, 2009



Stockholm region. Thus, business encompasses the full spectrum from research-oriented highly specialized firms and biotech suppliers to multinational pharmaceutical companies with capacity for both research and production. The basic activities in the value chain are supported by the additional functions, which promote collaboration, knowledge transfer, technology transfer, innovation and growth of the sector.

Other instruments of cluster development include networking, articulating needs/lobbying, collaboration/joint action, education/training and promotion. A number of agencies of relevance for the life science area are located in the region including the Swedish Medical Product Agency, the European Centre for Disease Prevention and Control, and the National Food Administration, the Stockholm School of Entrepreneurship and the National Veterinary Institute.

Lessons learned from Sweden

- 1) Cluster policy in Sweden is focused on making it easier to become an entrepreneur and can support the creation of new enterprises by introducing educational programmes. The main aim of these programmes is to improve the benefits which can be achieved by the entrepreneurs when they work together. Moreover, cluster initiatives can identify areas in which existing companies could benefit from establishing relationship with new suppliers and service providers.
- 2) Sweden is recognized as an innovation country. Cluster environments should be strong to create higher initiatives for R&D. Moreover, they should be also provide a good environment for cooperating with foreign research hubs and engaging foreign skills.
- 3) A crucial element of Swedish competitiveness is Sweden's skills. It is important to invest in workforce skills by conducting training programmes for employees. Workers' skills currently play a currently one of the most important roles in a globalized world.
- 4) In Sweden the universities have played an important role and should still be a strong element of building clusters. During the last years the positive correlation has been observed between an active policy, supporting higher learning and research round the regions and regional productivity growth.



5) Clusters could play a more important role in regional growth strategies. Regions could pay more attention to the potential benefits that can be achieved through cooperation at the international level. It is important to underline that benefits of having clusters are not only directed to the individual clusters, but also to the entire region.



5 MoS Projects

Chapter Summary

This chapter will.....

- Present information about the four MoS Ports studied
- Discuss some of the issues surrounding each of the ports and their experiences with developing MoS routes and improving SSS
- Highlight issues of concern which are hindering the MoS route

5.1 Case Studies of MoS Ports

This section will provide an overview of the four MoS ports which were researched as part of the undertaking on this report. These ports include:

- Port of Esbjerg, Denmark
- Port of Zeebrugge, Belgium
- Port of Sassnitz, Germany
- Port of Trelleborg, Sweden

The above ports will form the basis of the analysis and discussion surrounding how aspects related to clustering can benefit transport and logistics supply chains and improve overall SSS in the North Sea Region.

5.2 MoS Project Esbjerg-Zeebrugge

The development of the MoS route Esbjerg-Zeebrugge goes back to the opening of Cobelfret's Ro/Ro service between the two ports back in 2005. This route was introduced to take advantage of the fact that German government introduced a new road tax on trucks, taking effect on January 1st, 2005. This new road tax made it more expensive for goods to be shipped through and to Germany. As all trucked goods from Scandinavia need to pass through Germany, this would lead to increased costs for shippers and ultimately consumers. As such, Cobelfret Ferries A/S decided to take advantage of this situation and open up a route that would bypass the German road tax. The Esbjerg-Zeebrugge connection was seen as a good fit from both sides. For the Port of Esbjerg, it gave the port access to a major port and corresponding transport networks. For Zeebrugge, it further strengthened their position as one of Europe's most important SSS hubs with this additional service to Esbjerg.



The Esbjerg–Zeebrugge route started in 2005 and was first offered as a once a week service which later increased to twice a week from March 2009 to December 2009. After this time, it was decided to reduce the service back to once a week, partly due to the financial crisis. Despite this reduction in service, the volume of cargo has remained steady (Port of Esbjerg 2010). The Esbjerg-Zeebrugge route has seen major increases in ton kilometers (tkm), increasing by 98% between 2005-2006 and 21% between 2006-2007. If growth rates continue, it has been projected that by 2020 the new project could shift over 222.000.000 tkm off the roads and onto the sea. According to officials at the Port of Esbjerg, about 1.000 trucks a month are being taken off the Danish roads as a direct result of this route. This compares with over 120.000 trucks a month crossing the Danish-German border. While the numbers are still low, there remains great potential in capturing a large share of the cross border transport. Officials see that in the near future, the service could be increased with more sailings a week.

This success of the SSS route led Port officials to search for ways to increase the capacity of the route. For Esbjerg, this would also have to include upgrading the existing infrastructure and expanding capacity at the port, if volumes are to increase in the near future. As a result, port officials found that MoS funding could be a catalyst to assist with the desired expansion of the Esbjerg-Zeebrugge route.

The process to obtain MoS funding would allow the operator to double the capacity of this route and upgrade the some of the current infrastructure to and from the port. Studies have shown that cost can be lowered by up to 51% while CO² emissions can be reduced by up to 54% by using this route over road only transport. It also contributes to reducing congestion on European highways between southern Denmark, northern Germany and in the Netherlands. The two figures below present some research into the potential savings in pollution and costs associated with a MoS route between Esbjerg and Zeebrugge. The research has been conducted by the Department of Maritime Research and Innovation at the University of Southern Denmark.

Comparison of energy consumption and CO₂ emission for transport of goods with ship and truck between Esbjerg and Zeebrugge

The difference in the energy consumption and CO₂ emission by using ship and truck for the transport of goods between Esbjerg and Zeebrugge is shown in Table 1.

Table 1. Energy consumption and CO₂ emissions by use of ship and truck

	Energy consumption MJ/ton goods	CO ₂ emission kg/ton goods
Ship	237.8	18.6
Truck	511.6	37.5
Relative reduction achieved by using ship instead of truck	54%	51%

Figure 11: Energy and CO₂ Comparison between ship & truck between Esbjerg and Zeebrugge

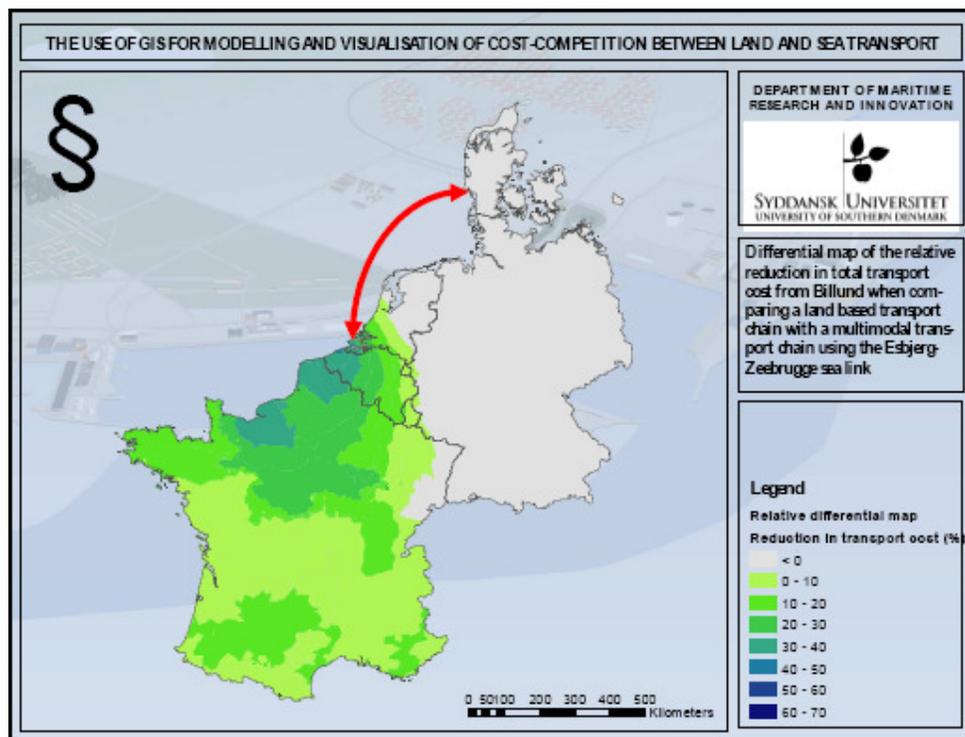


Figure 12: Reduction in Transport Costs associated with MoS between Esbjerg and Zeebrugge

From the above figures, it becomes clear that there are indeed some large reductions in both CO₂ emissions and cost savings for transporters by choosing SSS over road only transport. Promoting

connections between the port and hinterland was one of the aims of this MoS project. While customers are demanding faster time, lower costs and more stability in the transport chain, current services must be enhanced and bottlenecks must be addressed. Different documentation procedures often play a major part in delaying shipments to and from the port. As a result, one of the activities proposed under the MoS project has been the creation of a more efficient ICT interface between the terminal and cargo shipments. This ICT project has, however, been put on hold until further notice.

5.2.1 Introduction to the Port of Esbjerg

The Port of Esbjerg goes under the name “Gateway Scandinavia” which demonstrates the ports vision to become a leading port from Scandinavia to the rest of Europe. Approximately 270 companies are linked to the port and in turn over 7.000 people are employed at these port-linked companies. During the past several years, the City of Esbjerg and the port has increased their connections to the rest of Denmark with the development of rail and motorways direct to the port area. The last stretch of motorway, the E20, will be completed in 2014 and will allow vehicles to drive directly into the port area. The port area covers over 3.5 million sqm² of land and with an extensive infrastructure for both Ro-Ro and Lo-Lo, the port’s strategy is to focus on intermodal transport solutions. In 2009, the port was one of the best performing ports in Denmark with an after tax profit of about €7 million.

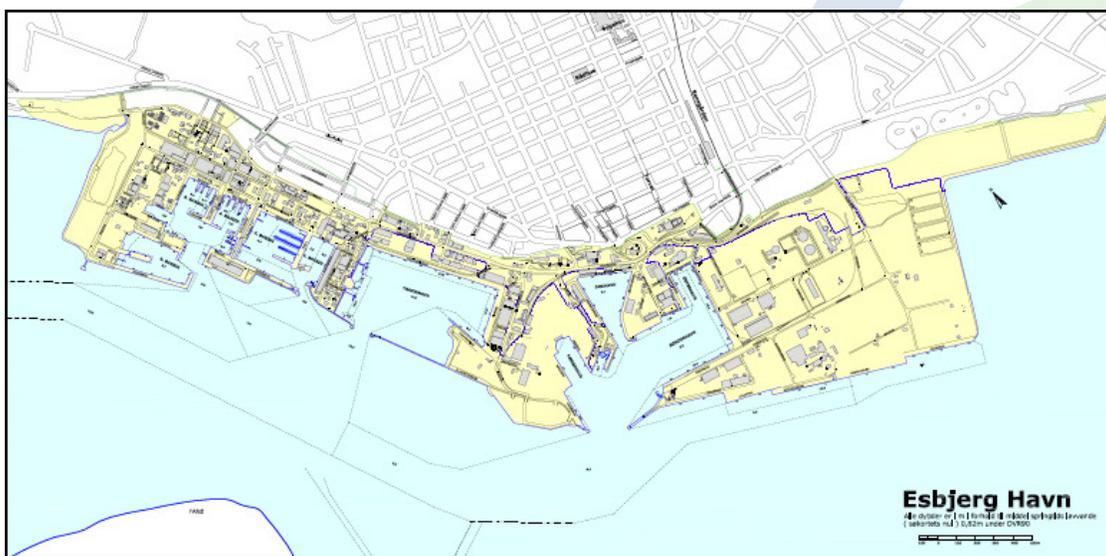


Figure 13: Port of Esbjerg

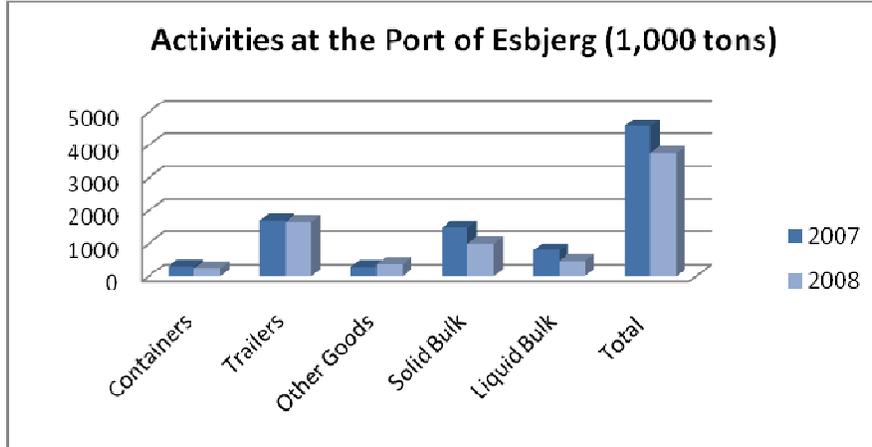


Figure 14: Cargo Turnover at the Port

5.2.2 Port Characteristics

While the presence of oil and gas off the western coast of Jutland, in the North Sea, has made the port a centre for the offshore industry in Denmark, increasingly other commodities and goods are passing through the port. The port is positioning itself to be a major facilitator to the windmill industry, with the export of windmill blades and turbines.

Infrastructure at Port of Esbjerg:

Total land area	3.5 million m ²
Rented areas	1,570,450 m ²
Developed areas	365,499 m ²
Infrastructure	1,137,965 m ²
Areas used by the Port itself	36,858 m ²
Non-developed areas	376,913 m ²
10 km of quays	



5.2.3 What would MoS funding mean for the Port of Esbjerg?

MoS funding for the Port of Esbjerg would be channeled into several key activities which will address some of the current challenges the port faces when increasing goods enter the port. As such, it has been proposed that the main activities for the port will be:

- Building of a 360m multipurpose quay
- Dredging of a 200m wide and 10.5 m deep channel
- A new multimodal terminal
- Extension of the existing Ro-Ro terminal
- Railway by-pass
- Traffic monitoring and streamlining administration

Some of the above mentioned activities will be discussed below.

The MoS funding will partly be used to fund a Ro-Ro floating ramp, which will be needed when the new extension of motorway E20 opens up and give the port direct highway access. The extension will reduce trucks passing through the city centre and causing unnecessary delays and pollution. Traffic counts between the current end of the motorway E20 and the port show approximately 11.000 to 17.000 vehicles a day (average daily traffic). With increased numbers of port users and traffic, the forecast for overall increase in traffic is expected to be between 20-25% from 2004 to 2015. Without improved infrastructure, severe congestion will most likely occur and have a negative effect on port operations.

With current operational capacities at Esbjerg's terminals running at near capacity, additional services and cargo at the port would bring about congestion and delays. Therefore, a new Ro-Ro jetty will be built at an expected cost of €6.2 million. The jetty will increase the capacity of up to 134.000 road haulage units a year for the port and provide better flows of goods from land side to ship.

When asked what MoS funding means to the port, officials expressed the importance of enhancing their hinterland connections and services. The more critical mass that can be clustered in the port, the more services can be offered and costs can be lowered for all. When the MoS funding was announced, it was a precondition of the the Danish Road Directorate to also commit to financing for

the road extension to the port. This was an important commitment and project for the port. The view from the Port of Esbjerg is that MoS funding can be used to get other projects going and bring in other important stakeholders, i.e. The Road Directorate, government officials, new firms, etc.

While the large oil and gas industry does not use the MoS route so much, it has become an important route for the plastics industry in Southern Denmark. With decent hinterland connections, however, goods being transport on this route are taken from all over Denmark.

5.3 Esbjerg's Hinterland Connections & Future Plans

The Port of Esbjerg sees its hinterland mainly along southern Denmark, over the islands of Funen and Zealand and into Sweden. There are three short sea shipping routes currently operating to and from the port. These routes sail to the Faroe Islands, Amsterdam and the existing Zeebrugge one. In addition, the port has a passenger ferry route to Harwich, England (Ro-Ro).



Figure 15: The Hinterland to the Port of Esbjerg (Port of Esbjerg 2009)



5.3.1 The Port's Future Business Plan

Port officials are prioritising intermodal transport within its business plans and strategies. The port has employed a person with expertise in intermodal transport and who works closely with firms at the port and other organisations doing business at the port.

Besides direct MoS activities, the port is also working on upgrading and renovating port facilities. Extensions, such as building a whole new quay and making more space available for new and expanding businesses are developments to cater to the booming offshore industry, which is playing an increasing central role in Esbjerg's plans. The port's master plan from 2004 is currently under way and as part of this plan, the port area will increase by about 25% in the coming years. The port has three special cranes for handling windmill blades and a new wharf will be used exclusively by the wind energy sector. Over 50% of the windmills produced in Denmark are shipped out via the port. Officials hope that the fast developing wind energy sector holds much promise for the port and region of Esbjerg. The port is also home to a central command post for Vattenfall's over 600 windmills out at sea. This new centre opened up in late 2009 and monitors all windmill activities, including at Horns Rev 1 & 2, the world's largest offshore windmill parks.

In addition to the above, the Port of Esbjerg will work to expand rail services to the port and it has already been given funding clearance by the Danish government with commitment of approximately €13 million (100 million Danish kroner) based on a self-financing of about €30 million. Rail services will allow the port to expand its hinterland connections, such as linking up with Denmark's only rail terminal, Taulov Transport Center, located 60 km east of the port.

5.4 The Port of Zeebrugge

Introduction

In recent decades, the Port of Zeebrugge, located on the North Sea coastline, has been among the fastest-growing ports in the Hamburg-Le Havre range. Due to its modern infrastructure, developed to meet the rise of roll-on/roll-off vessels and containerization, combined with excellent road and rail connections, the deep-draft facility has become a major multifaceted port, handling unit loads



(trailers and containers), new cars, conventional general cargo, “high & heavy” cargoes, dry and liquid bulk, and natural gas.

Leading car port

Zeebrugge has become the world’s leading port for the transshipment of new cars and in 2009 handled nearly 1.300.000 units. The SeaRo, Wallenius-Wilhelmsen Lines, International Car Operators, Toyota and CdmZ terminals together have a capacity of 175,000 cars a day on a surface area of approximately 300 ha. There are also 6 centres providing quality control, pre-delivery services and assembly of options according to the customer's needs. All major deepsea and shortsea Ro-Ro lines make several calls a week which has led to Zeebrugge becoming the world’s leading hub for automotive traffic. In addition to the Toyota Vehicle Logistics Center, car-makers using the port include DaimlerChrysler, Ford, General Motors, Mercedes, Volvo, BMW, Citroën, Peugeot, Rover, Jaguar, Vauxhall, Renault, Suzuki and Mitsubishi, for example. All large car makers have placed their trust in Zeebrugge, not only for transporting the final product, but also for carrying components and spare parts between several assembly plants in Europe. This also includes high & heavy cargoes such as excavators and agricultural machinery for which the port also supplies vehicle modification activities.

A major Ro-Ro center

Zeebrugge is a major European port for unaccompanied roll-on/roll-off (Ro-Ro) traffic. There are, for example, 13 fixed services to 14 different UK ports with up to 20 departures a day, including three to London. Other services include line sailings to Ireland, Scandinavia and countries in southern Europe, such as Spain and Portugal, and further afield to Turkey. Zeebrugge has 23 berths for Ro-Ro vessels, providing a total loading and discharge capacity of 3,500 trucks every 24 hours, or more than a million a year. Nearly 10 million tonnes of trailer loads and Ro-Ro-containers is shipped with Ro-Ro vessels annually. The main players in this field are Cobelfret, P&O Ferries and Norfolkline. Zeebrugge also offers passenger services on the ferry routes to Hull and Edinburgh and has grown into Belgium’s main cruise port with around 60 calls of cruise vessels every year.



Growing container port

In 2009 more than 2,3 million TEU were handled at the port of Zeebrugge. Deepsea container lines like CMA-CGM and Evergreen call weekly at the Container Handling terminal Zeebrugge whereas the newly created APM Terminals Zeebrugge caters for the calls of Maersk Line and The New World Alliance. Cargoes come mainly from the Far and Middle East and the Indian Subcontinent. The containers are subsequently transported via rail, road, with feeder vessels or via the inland waterways. Zeebrugge's container future is looking bright with a third large deepwater container terminal to become operational in the Albert II dock as of October 2010. Zeebrugge's main asset is its fast and easy nautical accessibility for the current-day + 10.000 TEU carriers.

Paper to fruit juice

Company facilities at Zeebrugge include the StoraEnso distribution terminal, which handles around two million tons of paper a year, dispatching newsprint, for example, on specially designed trains. Another major facility at the port is the European distribution center for Bridgestone where some nine million tires are shipped annually. Several companies organize the global distribution of their agricultural machinery while a number of major companies, including the New Zealand Zespri (kiwifruit) Marketing Board, are active at the port's fresh-fruit terminals. Tropicana's fruit-juice processing facility in Zeebrugge's inner port is the company's largest European production unit. The most recent acquisition is the Seabridge distribution centre for the storage and processing of coffee. Quite a few logistics companies also avail themselves of the wide array of frequent shortsea connections by using the Zeebrugge facilities as a bridgehead for distribution to the UK. Indeed orders picked before 2 p.m. on any given day will have a guaranteed delivery all over England and Scotland the very next day.

Pioneer in energy

Natural gas is supplied in two ways:

- Some 5 million tonnes arrives in liquefied form with methane tankers; this gas is exclusively destined for use in Belgium



- in gaseous form by pipelines through the “Zeepipe” from the gas fields off the coast of Norway and through the “Interconnector” from Great Britain. This gas is primarily destined for transit to France and other southern European countries.

Zeebrugge also has windfarms on the eastern breakwater and along the Baudouin canal that leads to the port of Bruges where mostly (break)bulk commodities are handled.

Modal split

In 2009 Zeebrugge handled a total of 45 million tons of cargo, with a modal split of 64% road, 8% sea, 3% inland waterway, 8% pipeline and 17% rail. Ongoing investment at the port is further developing its roll-on/roll-off and container capacities and providing additional areas for logistics operations. Moreover, an investment programme will double the port’s rail capacity whereas important breakthroughs were achieved for improving the port’s road access.

What would MoS funding mean for the Port of Zeebrugge?

For Zeebrugge, the connection with Esbjerg served to strengthen its focus on SSS services and add to its already 25 SSS routes from the port. The port was originally looking at a MoS route with a Spanish port, but this partnership was not viable in the near future so attention focussed then on developing a partnership with Esbjerg. More specifically the investments made in the framework of the project with Esbjerg concentrate mainly on the construction of a new Ro-Ro jetty.

Port officials aimed to diversify the routes as not to focus on too few connections. For example, Zeebrugge has large volumes going to the United Kingdom, but during this economic crisis volumes have dropped significantly. By establishing connections with other European ports, Zeebrugge has weathered the economic downturn well and actually saw an increase in overall goods shipped via its port.

One of the reasons for Zeebrugge’s success has been its strong hinterland connections. Port officials see further development in the rail and inland waterway connections as key to expanding the port. Current plans are to double the rail capacity from 750.000 TEUs to 1,5 million TEUs in the next 6-7 years. Officials admit that the use of inland waterways is still a weak point in their hinterland connections but hope to improve this in the future.



5.5 Discussions on the MoS Route with stakeholders

While an additional sailing between Esbjerg and Zeebrugge did not last more than 6 months, previous studies and rates of growth do indicate that there is a potential need for an extra sailing between the two ports. Port officials see the likelihood of additional sailings in the near future. Currently, the MoS project/partners are attempting to overcome this challenge and there have been ongoing discussions and meetings into the best way to address the reluctance of the operator for an extra sailing. This is, however, not entirely bad news. The work being currently done in the Port of Esbjerg is contributing the port to become a stronger actor and facilitator of intermodal transport. When cargo volumes pick up, as most presume they will in the near future, the port will then be well positioned to capture a larger share of the market. It has already proven that capture a larger market share, even in tough economic times.

5.5.1 MoS Funding/Application/Procedures

The Esbjerg-Zeebrugge project was the first to be awarded under the MoS programme. With this distinction came both challenges and successes. Being the first movers of the project enabled all the stakeholders (ports, EU officials, national and regional governments, universities) to really focus on how the MoS programme effects each of the above mentioned organisations. For the ports, the process was a way to add a new service to their business structure. While the Port of Zeebrugge already has an extensive list of routes and services, for the Port of Esbjerg, this was a good opportunity to work and learn from a larger port.

The application process was assisted by the University of Southern Denmark, whose expertise in the area of maritime transport played an important role in assuring that the analytic studies were done correctly and needed material to support the need for a new service was properly documented. As port officials explained to us, there is a need to bring several key stakeholders in to support the project along. Another key stakeholder, for Esbjerg, was the Ministry of Transport. As the Ministry had no previous dealings and knowledge about MoS, it took some time and was important for the Port of Esbjerg to get their support. Eventually, after lengthy negotiation and discussions the Ministry became an important stakeholder in the process. On the Belgian side, the close relationship



between the Flemish Ministry of Mobility and Public Works and the Port of Zeebrugge proved to be fruitful in speeding up the process and supporting the port's work to become a MoS port.

Having the distinction of having the first MoS route makes examining this project an excellent lesson on what can be learned for future projects. Both ports view the whole process of obtaining funding for their project as a challenging yet beneficial learning process. For the Port of Esbjerg, some of the most challenging aspects were to get support from the Ministry of Transport and to bring the needed partners together to discuss how they could make a winning proposal. With no previous MoS project to learn from, the task for the ports required careful negotiations and inputs from many partners to learn what was expected from the European Commission and what could be feasible from the ports.

On the Belgian side, the Port of Zeebrugge had already established good working relations with the Flemish Ministry of Mobility and Public Works and this was viewed as important for speeding up the work for the port and getting approval for their plans. On the Danish side, the Port of Esbjerg had to work hard to get support from the Ministry of Transport. With little knowledge about the MoS programme, it took some time for officials there to become important players in the project. The Ministry's support was eventually established and this was an important hurdle to overcome and ensure the project would be a success.

In addition to the ports, the European Commission – DG MOVE and the TEN-TEA were also involved in learning by doing. Since the process of the Esbjerg-Zeebrugge route was the first, EU officials were also examining the MoS programme and what they could learn from this case. EU officials admit that more flexibility was needed on their part, while the involvement of maritime operators in MoS projects took more time and efforts than originally anticipated. It was also concluded that clearer definitions of the expectations of the partners was something that needed a second look.

When asked if they had any advice for other potential MoS projects, port officials at Esbjerg and Zeebrugge state that it's extremely important that the need for MoS funding be clearly stated in the application. The use of independent studies, such as those made by universities, will only benefit the project and clearly show why and how a proposed project would benefit SSS, reduce road traffic



and lesson the environmental impact of the overall transport chain. It was also suggested that in order for ports to have a serious chance, they must be realistic in their own capabilities of a port, ie. The Port of Esbjerg is considered to be the minimum size for a realistic and beneficial MoS project (TEN-TEA Representative).

The above viewpoint is also shared and expressed by DG MOVE officials. While there has been disappointment with the low numbers of applications for MoS project and the low success rate of submitted projects, there is also the understanding that the concept is complex and is in its early stages of development. Unclear definitions have been addressed and improved upon in the latest documents and applications. At the same time, EU officials stress that projects often fail to provide sufficient analysis for their case of freight flows and goods in their applications. A clear need for a new route and infrastructure must be made if more applications are to be accepted. It is the hope that the new MoS 2010 call, which has been updated to reflect, in part, the lessons learned with Esbjerg-Zeebrugge, will bring more successfully applications.

5.5.2 Road Transport

While much discussion has been given over the MoS routes and ways to improve intermodal and SSS in Europe, what are often overlooked in our discussions are the effects of other policies on MoS. As the stakeholders discussed, the real driver for the initial MoS route between Esbjerg-Zeebrugge was the introduction of the Germany road tax (MAUT). Nearly all goods from Scandinavia have to pass through Germany and thus the tax would increase costs and administration procedures for forwarders. As an alternative to this, Cobelfet introduced the Esbjerg-Zeebrugge line to capture some of the market share of trucks going through Germany. Germany, however, will not be the only country introducing a road tax on trucks. Other European countries are in discussion for the same initiatives, such as Denmark and the Netherlands. If this is the case, firms and forwarders will be searching for alternative modes to ship their goods. This could be seen as a crucial moment for increasing the modal share of SSS.

The shift from road to maritime transport will have to also involve a change in thinking. While some goods are time sensitive and must be transported as fast as possible, most goods can take a little more time in transport time without negatively effective the end users and production firms. Before the economic crisis, there was a lot of attention focused on congestion problems and while



this has somewhat died down, it will no doubt increase again as the volume levels rise. As such, the acceptance of shortsea shipping will have to be seen as part of the solution.

5.6 Cluster Initiatives in Southern Denmark

There are two examples of cluster organizations in Southern Denmark that are worth briefly discussing here as they support the remaining of the MoS route by bringing economic growth to the region. Their experiences in working with developing clusters provide some good lessons for us to learn from.

5.6.1 Region of Southern Denmark Cluster Programmes

The Region of Southern Denmark is actively promoting the development of clusters as a strategy to bring economic growth and to diversify its regional economy. The region employs a cluster expert, Olav Sønderskov, who works on developing policies and programmes to support cluster managers in their work. The Region of Southern Denmark has four ‘growth forums’ which work on four key sectors for economic development: energy, welfare technology, experience economy and cluster development. Mr. Sønderskov works with developing the framework for clusters and assisting cluster managers to carry out their work, along with assisting with financing and networking.

Inspiration for his work comes from courses developed in partnership with international cluster examples and experts in the field such as the world renowned cluster expert, Ifor Ffowcs-Williams. The Region’s cluster initiatives started in 2007 when the Region advertised to firms and organisations if they needed help in developing their clusters. This bottom up approach was also used as a learning experience for the region that has now developed a full cluster plan and programme. The Region today has taken a more aggressive approach and now focuses efforts on emerging clusters and businesses, which show promise for future growth. In this way, they have taken a more top down approach versus the more initial bottom up approach. The Region believes that it is important for someone to assist with the managing of clusters, especially within areas such as networking and financing. In this way, there is a higher level of stability and a central contact agency who can provide assistance and support the cluster.



One area the Region has focussed on is in the area of “welfare technology”, which consists of developing technologies used to improve working conditions in social institutions and hospitals. The idea behind welfare technologies is to bring down costs and increase efficiency, something needed in Europe, as the population ages faster than young workers enter the work force. One of the main aims of the Region is to create a demand for such technology by assisting firms in developing their products by creating a market for such products. In this way, the Region works on the supply side of cluster management - creating a demand for new technologies by supporting the development of products and bridging this with a market.

Regarding transport and logistics, the Region had been doing some work in developing these clusters but admits that it is new and often difficult to get the actors together. Despite this, the Region sees great potential in developing a strong economic base that takes advantage of more sustainable forms of transport. Officials at the Region stress that the soft effects are an important means for stimulating clusters and there is a generally belief that their efforts are working. However, these efforts are often hard to directly measure. The ability and understanding to effectively document these effects would go along way and contribute to our understanding and demonstrate the ability of cluster management to increase productivity and the host of other benefits that clusters can bring. Another point worth mentioning was that the Region believes that it can often help if a larger player is involved, i.e. a large corporation or firm. The presence of a larger player brings with it resources and awareness to the particular cluster and often opens the doors to further development. Also, larger firms have the human resources to often make to develop a more financial sound cluster and thus their know-how can be a determining factor in the success or failure of a cluster.

5.6.2 The Offshore Centre Denmark

The Offshore Center Denmark (OCD) can be viewed as a successful case of cluster management. The centre works on behalf of 225 members in three main areas: networking, project development (administration) and promotion. The main goal of the OCD is to strengthen and support the Danish offshore sector via supporting companies in this industry to become more competitive and competent. The OCD relies on member support, private funding and funding from the Danish



Ministry of Science, Technology and Innovation, along with the Region of Southern Denmark who provide some funding.

The OCD was started back in 2003 with 30-40 members with the aid of the Ministry of Science, Technology and Innovation with the intention of bringing firms together to develop the industry further through developing some specific projects. At the time the OCD was formed many were worried that the industry was going nowhere due to several bad experiences with wind turbines (rust problems, technical glitches, etc.). By partnering up with the oil and gas industry and learning from these experiences of operating out at sea, the windmill industry was able to overcome these problems and today most new windmills are successful installed at the sea with few problems.

According to the OCD, the use of SSS services is playing a more important role in the development of their industry, compared with five years ago. While still small, the demand for windmill components from the North Sea Region is huge. As several governments, in Germany, the Netherlands and the U.K. have committed themselves to increase energy from wind; there is an increasing need for transport of these parts. There is currently a lack of the proper equipment, such as ships to carry windmill blades, and there is need for enhanced coordination and logistics for this growing industry. While funding is not seen as a major issue for the offshore wind market, the fast development and growth of the industry makes it challenging to keep up with the pace of growth. Other challenges facing members of the OCD are related to finding enough qualified workers and creating a framework for the fairly new offshore wind energy industry.

5.7 Cluster Initiatives in Belgium

There is an example of a cluster initiative in Belgium that is worth briefly discussing here. In addition, some comments and thoughts about cluster and economic development from the Province of West Flanders will also be given, in order to provide some good lessons for us to learn from.



5.7.1 Regional Viewpoint on Cluster development

In an interview with a regional economic development officer for the Province of West Flanders, the officer explained that the priority for his region was developing business infrastructure and entrepreneurship knowledge – such as innovation, technologies and sustainability. The focus is on planning for supporting such initiatives, with a heavy focus on the way the ports in the region can be linked to this planning and development.

With one of the strongest agro-food clusters in Europe, the Province strives to maintain a leading role in this area. In addition, there are other strong clusters in the maritime industry, textiles, metal and machinery and the plastics industry. The above mentioned clusters are supported by different logistics platforms, such as the River Terminal Wielsbeke, Transportcentrum LAR, Avelgem Container Terminal and the ports of Zeebrugge and Oostende as main hubs. One of the future goals of the Province is to take a more proactive role in developing and promoting existing clusters in the Province. The province wants to become the facilitator for the development of these clusters and networks. Experiences have shown that it can be challenging to get different stakeholders together and to integrate new networks. Therefore, a more active role could assist officials with bringing about more cooperation.

One of the current programmes that the Province has developed is a series of business parks and centres which offer infrastructural and guidance to potential new entrants and investors to the region. 13 new sites have been developed, varying from business centres, to flow-through buildings and innovation and incubation centres. Support and tools for these initiatives are accessible on webpages such as www.actievoorstarters.be, www.bcwestvlaanden.be, www.investinwestflanders.com, and www.west-poort.be.

In discussing the potential further development of the MoS route between Esbjerg and Zeebrugge, officials believe that there is some promise in looking the specific regional strengths. In the case of West Flanders, the agro-food industry is particularly strong and there could be new opportunities for making the food logistics chain more efficient. On the other side, the large seafood production in Denmark can benefit from the logistics facilities in Belgium and beyond to access more markets.



5.7.2 Cluster Transport & Logistics Wallonia-Belgium

An example of cluster management for transportation can be found in Belgium. Known as the *Cluster Transport & Logistics Wallonia-Belgium*, the organization gathers important actor's together (conveyors, logisticians, managers of infrastructures and training organizations) and coordinates initiatives themselves and other transport and logistics programmes in Belgium. The main objectives of the group are to foster better networking and improve the potential for added-value services for firms. The group also works closely with local officials to create better policies and support to make the region an attractive place for investments.

At the regional level, there are 3 local sub-clusters which work on developing an interregional policy with the neighbouring regions. These include:

- The Pole Transport & Logistics of Liège is oriented to the area Meuse-Rhine, which includes the Province of Liège, the Belgian and Dutch Limburg and the German region North-Rhine Westfalia.
- The Pole Transport & Logistics of Luxembourg is part of the SAAR-LOR-LUX region including Belgian regions (Province of Luxembourg), French regions (Lorraine), German region (Saarland) and the Grand Duchy of Luxembourg.
- Finally, the Pole Transport & Logistique of Hainaut, which also includes the companies from the Provinces of Namur and Walloon Brabant, will get closer to French regions of Nord-Pas-de-Calais and Ardennes.

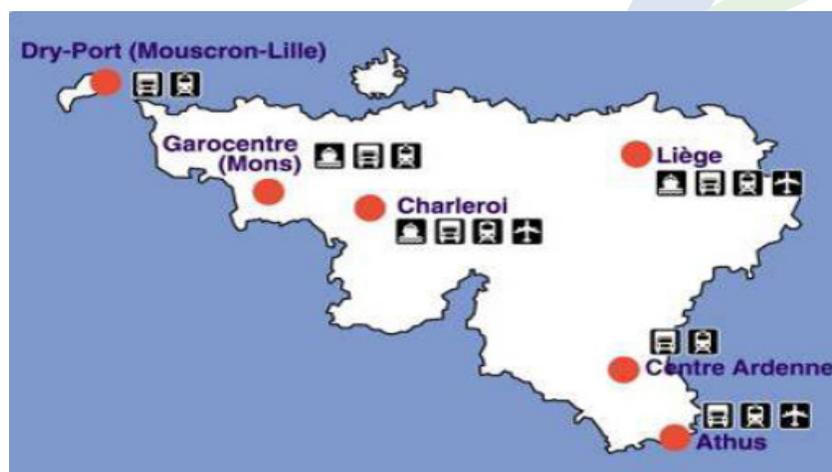


Figure 16: Transport Clusters in Wallonia



An industrial example that the Transport & Logistics group works with is the forestry industry. This cluster has been started in 2009 and has already shown some preliminary benefits. This cluster includes the production of semi- and finished goods, such as furniture as well as lumber production. The group works with helping firms identifying potential networks, evaluating the need for additional clusters (or sub-clusters) and working with assisting with researching and providing support to promoting the cluster initiatives.

Activities in the first year have revealed that there are about 550 companies in Wallonia working within the forestry industry and over 70% of the firms have 5 or few employees. It has also been revealed that there is willingness by firms to work in groups and with networks by the members. In order to get the cluster up and running, the group was “clustered” into three working groups, one for **furniture design**, one for **carpentry** and one for **wood pulp**. The Furniture design sub-group works on developing innovative projects for furniture and furniture accessories which are mainly target for supermarkets and shopping centres. The carpentry group came together and formed a *groupement d'intérêt économique* (Economic Interest Group), which is a formal grouping that work together to build up competitive advantages. Finally, the wood pulp group has formed an interregional group that aims to use the Sixth Framework of European Research and Development Programme to assist them with implementing project idea the group has.

During this, the second year of activities, the wood cluster hopes to continue to work with the vertical integration of businesses, through such things as working on projects of common interest. The group will also work with retaining skilled people who can guide the group and manage the various projects. Finally, the group will be involved in a trade mission to China, which they see has a huge market for their goods and for developing their industry.

5.8 High Quality Rail and Intermodal Nordic Corridor - Königslinie

The project “High Quality Rail and Intermodal Nordic Corridor - Königslinie” is one of the MoS-projects chosen to be funded under the TEN-T programme 2007-2013. The project has started in

January 2008 and is estimated to end in December 2013. The so called “Königslinie” is an over 100 years old rail ferry link between Germany and Sweden. It is going to be improved in order to increase the modal shift of rail and intermodal transport on this corridor.

The Sassnitz-Trelleborg connection is the shortest link from Germany to Sweden via ship. The distance between the ports is 100 km, the travel time is 3h 30minutes to 4h. There are several services (currently 4 times a day) per direction offered by two ships which are able to load intermodal units, cars, trucks and rail.

The link between Sassnitz and Trelleborg opens a wide hinterland to Sweden and Norway in the northern direction and the whole hinterland of central Europe: southern France and northern Italy to the south and the Black Sea to the east (see Figure 17 below).

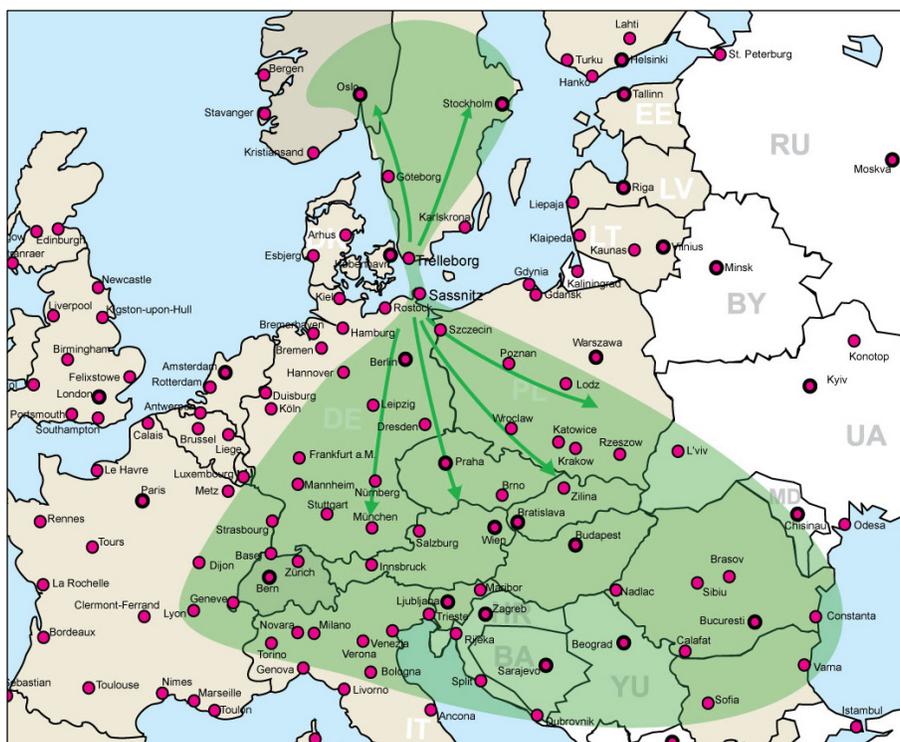


Figure 17: Hinterland of the Königslinie rail-corridor (Cardebring 2007)



The project aims to increase rail transport in order to raise the modal shift. Rail transport has a share of 81% of the total turnover each year measured in tons. The 1.7 million tons transported in 2008 shall be increased to 3 million tons in 2018. The overall corresponding modal shift is 1.4 billion ton km per year in 2018 and 2.1 billion ton km per year in 2028 (TEN-TEA 2009).

The focus of the project is to improve both ports' infrastructure in order to serve more than one rail/road/intermodal ferry route and to enable the port to load, unload and store intermodal transport units, e.g. unaccompanied trailers. In addition, reconstruction of berths, adaption of RoRo ramps, a new generation of new or converted rail decks for ferry vessels, improvement in IT systems and rail marketing activities are elements of the project to upgrade the rail ferry link within the TEN-T (TEN-T EA 2009).

The involved actors and beneficiaries are the Port of Trelleborg, the Port of Sassnitz and Scandlines GmbH. More recently Green Cargo AB (Sweden) and DB Schenker Rail (Germany) were invited to be external partners, as they are the main operators on this link (TEN-T EA 2009). For the two rail operators the interest in this corridor is due to their two-way strategy, in which the Königslinie corridor is the alternative to the Öresund Bridge, when it comes to limited capacities. The overall project costs are 50 349 000 €, whereof the action promoters cover around 40% (20 608 846) and the EU around 20 % (10 200 000 €). Other funding sources are used for the remaining 40%.

The tasks within the project were shared as follows. The overall project coordination was managed by the port of Trelleborg. To develop the project application they got assistance from a consultancy BMT (British Maritime Technology) with extensive experience in the application process. The other project partners support the process by providing the data and information needed. The preparation started already in the year 2007.

Concerning the current state of the project it has to be stated, that due to the economic crisis, there are some obstacles. Scandlines is waiting for economic growth before they will invest in the new ship technologies. The port of Sassnitz will await the investments of the shipping line before they will start to adapt their terminal, currently there are studies running on IT integration, market study



and fast handling. The port of Trelleborg has already made investments to build a new terminal, for further steps they will also await the investments of the shipping line.

In the following section, the Port of Trelleborg and Sassnitz are briefly presented.

5.9 Port of Trelleborg

Trelleborg port is one of the major RoRo and ferry ports in Scandinavia. It is the second largest port of Sweden, behind Gothenburg. The port serves as an intermodal hub which combines different transport platforms for traffic between Scandinavia and Continental Europe (Port of Trelleborg 2010a). An overview of the details of Trelleborg port is provided in Table 1.

Anchorage depth: 6.4m - 7.6m	Railway size: Small
Cargo pier depth: 7.1m - 9.1m	Harbor type: Coastal Breakwater
Oil terminal depth: 7.1m - 9.1m	Max size: Over 500 feet in length
Dry dock: N/A	Repairs: Limited
Harbor size: Small	Shelter: Good

Figure 18: Port of Trelleborg facts (Port of Trelleborg 2010a)

Berths and handling facilities

The Port of Trelleborg is a logistic node in the customers' supply chains – a transfer terminal for road-, rail- as well as for intermodal transports via ferry connections. It has 10 RO/RO berths with different ramp systems and rail connections for efficient handling (Port of Trelleborg 2010a). The port handles approximately 15% of the Swedish foreign trade in terms of value. In 2006, the port handled 11.4 million tonnes of cargo, a new record for the port (Figure 19). The number of truck units reached a total of 500.000, and the number of handled rail wagons was 85.000. The intermodal-traffic (swab bodies and semi-trailer) increased to 50.000 units (Trelleborg Port 2010b).

Recently a new Logistic Centre with 17.000 m² for Cross-docking, Warehousing and 3rd Party Logistics was established in the port, offering additional logistics services (Port of Trelleborg 2010b).

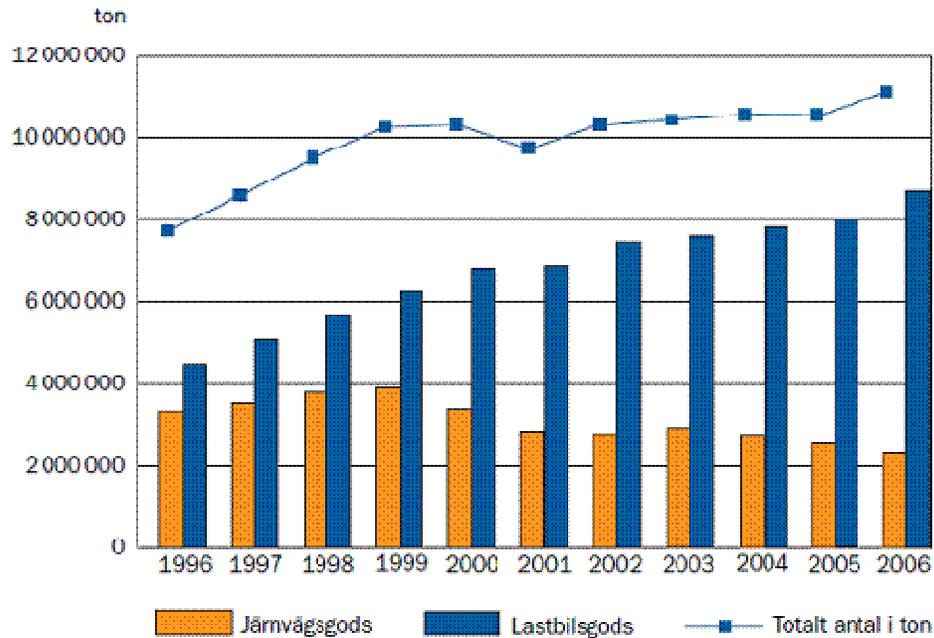


Figure 19: Freight trends 1996-2006. Orange illustrates rail freight, blue lorry freight. Blue dotted line represents total freight in tonnes. (Port of Trelleborg 2010b)

Trelleborgs Hamn AB

Trelleborgs Hamn AB is the company that provides port- and warehousing services in the port of Trelleborg. Since October 31, 2005, Trelleborgs Hamn AB is the owner of all port facilities including real estate. This means that the company is also responsible for investments as well as operation and maintenance of all assets.

The company has three business areas: port, handling and property management. In addition, the port operates a warehouse / logistics centre with a surface of 17.000 plus 10.000 square meters for transshipment, storage and third party logistics (Port of Trelleborg 2010a).

Services

Three ferry lines operate from Trelleborg Harbour; TT-Lines, Scandlines Hansa and Unity Line. TT-Line operates 6 RoPax ferries; 4 ferries serve Trelleborg-Travemünde and 2 ferries Trelleborg-



Rostock. Scandlines operates 5 RoPax ferries; 2 ferries serve Trelleborg-Sassnitz, 2 ferries Trelleborg-Rostock and 1 ferry Trelleborg-Travemünde. Unity Line operates 2 RoPax ferries serving Trelleborg-Swinoujscie (Port of Trelleborg 2010b).

Between 00.30 and 23.00, the ferry lines offer one connection to Continental Europe every hour, during weekdays as well as on weekends. 1.7 million passengers travelled via the Port of Trelleborg during 2006 (Port of Trelleborg 2010b).

Development plans: Vision 2010/2015

The port of Trelleborg has just been granted a permit application by the Environmental Court in Växjö for the continued expansion of the port - the so-called *Vision 2010/2015*. The development will include four new ferry berths and related areas to the south and southeast of existing ferry berth 9, and two new breakwaters; one to be located west of the harbour entrance and one to the east (Nielsen 2010). The expansion would be phased with completion around 2015. The cost of the entire expansion project is estimated at about SEK 1 billion.

The development is primarily aimed at relocating ferry traffic further away from the center of Trelleborg, which would have significant benefits for local air quality. It would also mean that parts of the old port area would become available for urban settlement in an attractive and central location in the city of Trelleborg (Port of Trelleborg 2010a).

Hinterland

Geographically, Trelleborg port is Sweden's most southern port, located only 85km from the German border (Trelleborg Port 2010b). 13 RoPax ferries operate regularly between Trelleborg and the European continent (Port of Trelleborg 2010b).

Trelleborg port is located in the town of Trelleborg, which is the southernmost town in Sweden and located in Skåne County. Trelleborg municipality describes itself as an important industrial and port town by the Baltic coast and the starting point for European routes 6 and 22 as well as highway 9

and County Road 108. European route 65 and County Road 101 cross the northern part of the municipality (Trelleborg Municipality 2010).

5.10 Port of Sassnitz

The port of Sassnitz/Mukran is located at the Baltic Sea at the edge of the isle of Ruegen (not to be confused with the City Port Sassnitz). It is the easternmost deep-water port in Germany. In the port of Sassnitz/Mukran two operators provide several different services: the Fährhafen Sassnitz GmbH which belongs 90% to the city of Sassnitz and 10% to the state of Mecklenburg-Vorpommern (MV Government Portal 2010), and the Sea Terminal Sassnitz which is operated by the Buss Sea Terminal Sassnitz and owned 90% by the Buss Group and 10% by the Fährhafen Sassnitz GmbH (Sea Terminal Sassnitz 2010).

The importance of the port is mainly due to the fact that it works as a transit point in the European rail network on the one hand with the USP to be the only North-European port where the axles of goods wagons can be switched to the Russian, Baltic States and Finnish wide gauge system. On the other hand it is one of the base ports of the Nord Stream gas pipeline project.

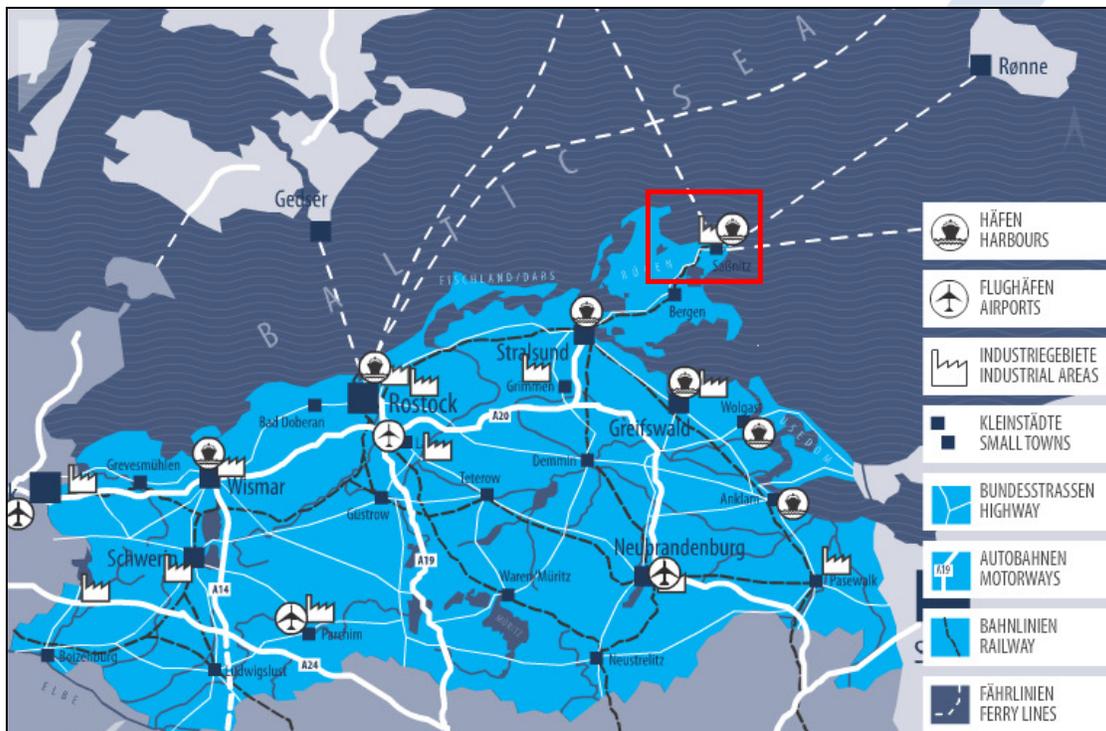


Figure 20: Map of Mecklenburg-Vorpommern with transport routes and nodes (MV Map 2010)

The development of the share of good types can be seen in Figure 21 from 2004 to 2008. The high share of RoRo turnover is due to the position as transit point for the rail link Germany-Sweden. The increase of bulk cargo in the year 2008 is a result of the start up of the above mentioned pipeline project.

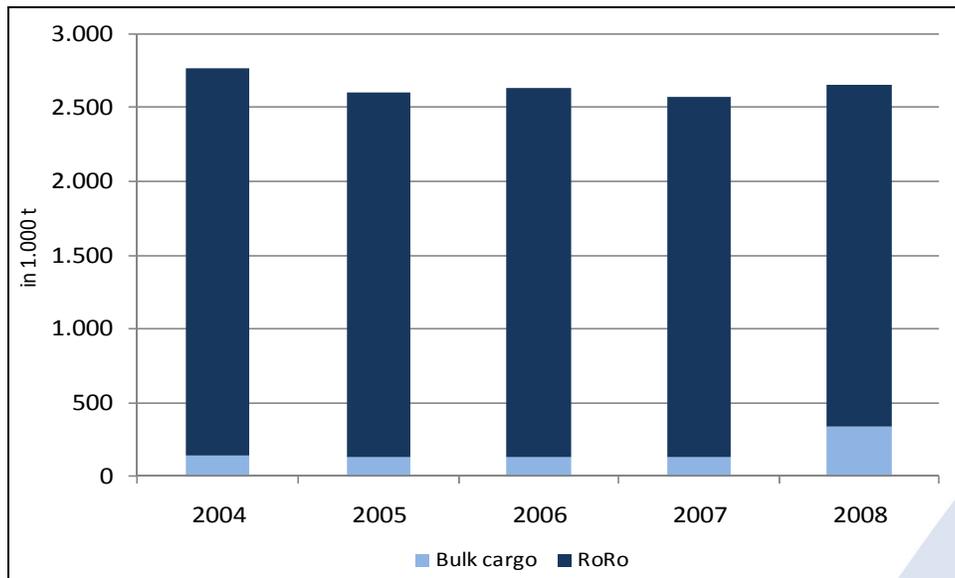


Figure 21: Development of the share of good types for the years 2004-2008 (Destatis 2010)

Figure 22 shows the amount of RoRo in the port in comparison to other ports in the Baltic Sea (Destatis 2010). Caused by the economic crisis there was a decrease of RoRo turnover of -35/-40% since November 2008.

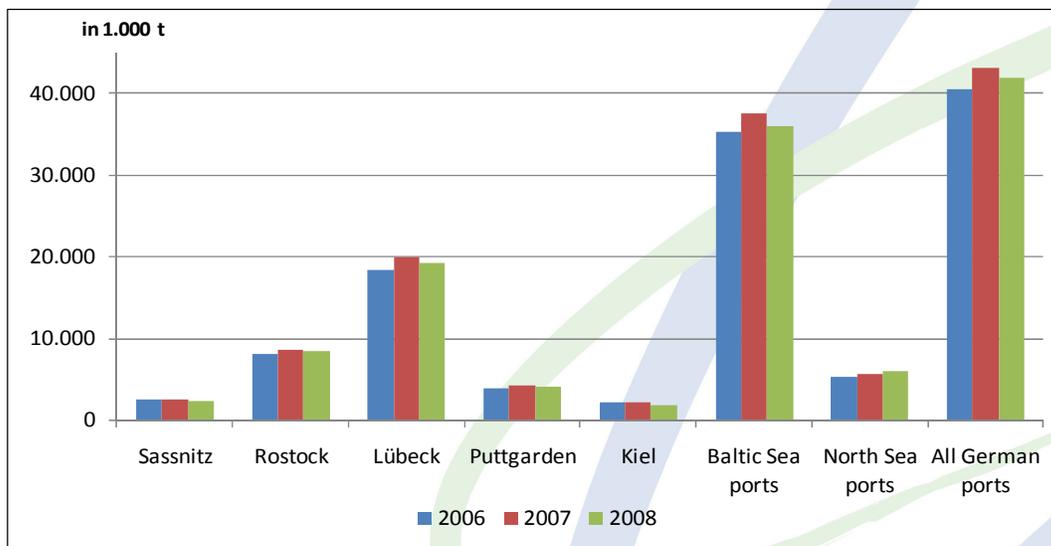


Figure 22: Total amount of RoRo-turnover for the years 2006-2009 (Destatis 2010)

Concerning the total turnover (in 1000 t) Sassnitz is the fifth biggest ports in the German Baltic Sea. When it comes to RoRO-turnover, it is the fourth biggest.

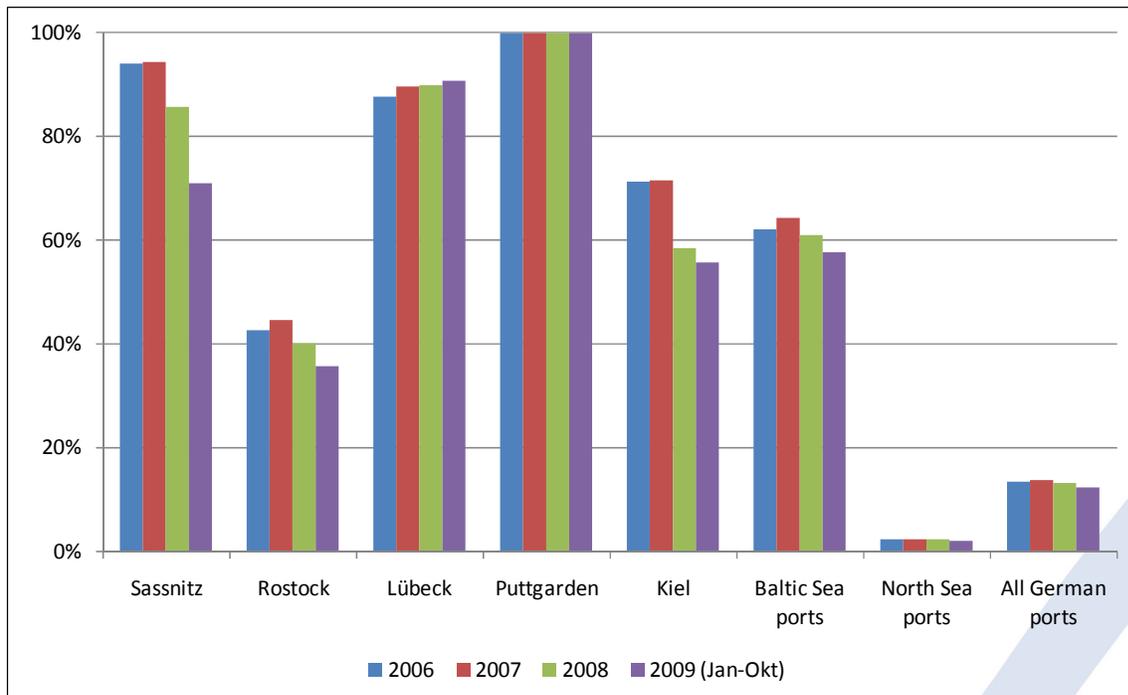


Figure 23: Share of RoRo-turnover on total cargo turnover for the years 2004-2008 (Destatis 2010)

Figure 23 demonstrates the high share of over 90% RoRo of the total turnover in comparison to other Baltic Sea ports. Only Puttgarden as part of the corridor via the Öresund Bridge has a higher share. The decrease in the first half of the year 2009 is due to the fact that even though the RoRo turnover was affected by the economic crisis, bulk cargo remained stable, as the pipeline project was not affected.

5.10.1 Services

In **Fejl! Henvisningskilde ikke fundet.** liner services from and to the port of Sassnitz are shown.

Route	Transportation	Frequency	Shipping line	Capacity	Travel time
Sassnitz-Trelleborg	roro (rail and trucks/ trailers) and pax	4 times a day	Scandlines	360-380 m for truck/trailers, 700-710m rails, 900 passengers	3 h 30
Sassnitz - Rønne	ropax	Twice a day	Bornholms- trafikken	1235 m for truck/trailers, 400 passengers	3 h 30
Sassnitz –	roro	Once a	TransRussia-	1800/ 3200 m	48 h

St. Petersburg		week	Express	trailers	
Sassnitz - Klaipeda	roro (rail and trucks/ trailers) and pax	Twice a week	DFDS LISCO	108 trailers, 90 rail wagons, 132 passengers	18-20h

Figure 24: Liner Services from/ to the Port of Sassnitz

5.10.2 Berths and handling facilities

There are different berths and handling facilities in the port. Especially ferry traffic and combined RoRo traffic for passenger and cargo by road and rail can be served. Berth 1 is for conventional cargo with a length of 100m. Berth 2 and 3 handle conventional RoRo with a length of 110m and 190m. Berths 4 and 5 have ramps for broad-gauge track RoRo, both with a length of 220m. Berth 6 is made for RoPax and berth 7 for normal-gauge track RoRo, both with a length of 250m. Berth 8 is 190m long and handles conventional RoRo and has a track access (Ferry Port Sassnitz 2010). It is the only berth operated by the Buss Sea Terminal Sassnitz GmbH, a mostly private terminal operator. The Nordmole (see map below) has no specific facilities with a length of 500m. Berth 9 is under construction with a final length of 175m (Verivox 2009).

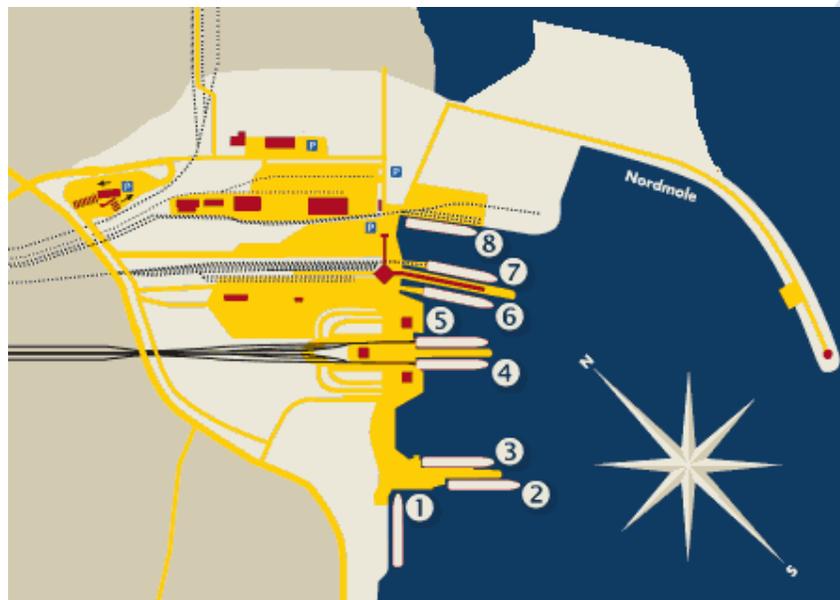


Figure 25: Map 2: Port Map of Sassnitz/Mukran (Ferry Port Sassnitz 2010)



5.10.3 Hinterland Connections

The isle of Ruegen, where Sassnitz is located, is connected with the new Ruegen Bridge and has access to the European trunk road and motorway network via the coastal motorway A20 and the federal highway B96. It is connected via rail by a fully electrified double-tracked line (Ferry Port Sassnitz 2010).

5.10.4 Development plans and capacity

The port development plans in the southern port area in the long-term includes a finger pier with two further ferry berths, surfaced marshalling and traffic areas up to approx. 125.000m² and a conversion of berth 5 for train ferries with normal-gauge track. In the northern port area three additional RoRo berths are planned, areas up to approx. 92.000m² are held for marshalling and traffic areas as well as industrial establishment areas with 140.000m². Most of the areas belong to the Deutsche Bahn AG (ITZ 2009).

For the Nord Stream pipeline between Russia and Germany, Sassnitz has recently become an important supply base for the pipe segments, which are also being coated at the terminal before being used underwater (Nord-Stream 2010). Therefore berth 9 is under construction with a final length of 175m. After finishing the Nord-Stream pipeline, which is planned towards the end of 2012, the area shall be used as an offshore supply base for offshore wind parks in the Baltic Sea (Verivox 2009).

In addition, there were plans for building an energy plant with a combined synthetic fuel producing facility using renewable raw materials close to the port, but the latest developments have shown that the fund now plans the facility at the port of Stralsund due to better logistical connections and support of the local government (Soilutions 2009).

5.10.5 Scanlines GmbH

Scandlines GmbH (previously Scandlines AG) is a Danish/ German shipping company which provides ferries from Sweden to Denmark and Germany in cooperation with Scandlines AB, the Swedish company is owned by Stena Line. Scandlines AG was founded in 1998 as the result of a merger between the largest national ferry companies in Denmark and Germany; private company Deutsche Fährgesellschaft Ostsee mbH (DFO – itself a result of a merger between east and west



German rail companies Deutsche Reichsbahn and Deutsche Bundesbahn in 1993) and Scandlines A/S. Scandlines AG was converted into a GmbH in 2007 with head offices in Rostock and Copenhagen.

Scandlines GmbH is one of Europe's largest ferry companies. The company operates 17 ferries on eight routes between 11 ports in the Baltic Sea. Their core area of operations is the triangle between Denmark, Germany and Sweden, where they have the densest route network of any ferry company. In addition, they are developing freight services to and from the Baltic countries and through the Baltic countries to Russia. The company transported more than 17.3 million passengers, four million cars, one million lorries, 84,000 railway wagons and 68,000 coaches in 2008 (Scandlines 2010).

5.11 Discussions on the MoS Route with stakeholders

According to the intention of task C3 in WP C, further information was obtained on the cluster factors by conducting interviews with the main stakeholders of the MoS project, e.g. port authorities, shipping lines, private companies and authorities at the regional or national level. The aim of the interviews was to investigate in what way success factors of the cluster concept played a significant role in this MoS project.

Due to the fact that this particular MoS project focuses on one part in the European rail transport network, regional companies have not been involved in the application process. The main players are the already named beneficiaries: the two ports and the shipping line Scandlines. Furthermore it can be stated that also the regional authorities brought some effort in the application. Both Trelleborg port and Sassnitz port provided an interview for this study, whereas Scandlines rejected on the basis that the MoS project was still at the application stage. The regional authority responsible in Sassnitz also granted an interview, whereas it was not possible to locate an interviewee representing the regional authorities in Trelleborg. As private firms have a limited capacity to determine whether their freight is transported via the Øresund road bridge or the Trelleborg-Sassnitz 'sea bridge' it was decided not to approach individual firms for this part of the study.



As a result, the following chapter focuses firstly on the ports' perspectives on the MoS project, and secondly on the perspective of the regional authorities represented by the Ministry of Transport of the Federal State Mecklenburg-Vorpommern.

5.12 From the port's perspective

5.12.1 Motivation

The main motivation to be part of this MoS project was to increase the capacity of the existing railway link and to reduce handling times. The ports have seen a decline in railway traffic over the last 10 years and wished to improve intermodal traffic to the ports. They also wanted to develop the port with other parties and regarded MoS funding as a way of getting 20% of their planned investment back from the EU. The goals for this MoS project are thus primarily to change the negative trend in railway traffic, and to develop the ports.

The initiative to apply for funding came from the port of Trelleborg, who addressed the port of Sassnitz with the idea to increase rail cargo volumes by investing in port infrastructure. Together they also convinced the operating shipping lines to invest in new ship technologies which will make operations more efficient.

5.12.2 Funding programme/ procedure

The port of Trelleborg is the lead partner for this MoS application. The process is being led by the Managing Director at the port, who has one other person assisting with the application. As previously mentioned, assistance has been sought from consultants with extensive experience in the application process.

Regarding the application process the main feedback from the port of Sassnitz was that the main obstacle was to face bureaucracy, which was evaluated as not feasible without consultants. This was reflected by the port of Trelleborg, who regarded the application procedures and requirements as complicated. The support from national and regional authorities was evaluated as very helpful.



Regarding the funding programme itself, it was recommended to increase the funding rate for infrastructure.

5.12.3 Cluster aspects

Concerning the cluster approach it must be stated that this played a minor role for the MoS project. Especially the characteristic of clusters to bundle regional strength could not be found. Business strengths have not been strongly considered as part of the application process. The port authorities had not explicitly identified any business networks for the MoS route, and did not feel that the MoS had affected regional development or business enterprises in the region.

The Port of Sassnitz is a strength itself for the region, but especially concerning RoRo turnover independent of the region's industry. As mentioned above, the port is a transit point in the European network and the region's companies not a major source for transport volumes on the MoS-route.

One aspect which should be mentioned in the cluster context is that the cooperation with the main rail operators has been strengthened. Negotiations with Green Cargo AB and DB Schenker Rail, who currently limit the amount of freight transported by sea, were instigated through the MoS project. Green Cargo AB and DB Schenker Rail were also invited to be external partners in the MoS project. This strengthening of communications and business relationships between the ports and operators and a common strategy for improving efficiency of transport, fits into the idea of the cluster concept strengthening business operations.

Apart from the MoS application Sassnitz port is actively attracting new customers in the hinterland by giving port presentations in e.g. Hungary, Austria, Czech Republic. Therefore they cooperate also with other transport operators. Thus it can be concluded, that cooperation as an important cluster characteristic is fulfilled to initiate cargo flows along the transport chain.

Similarly, Trelleborg port is actively promoting the port and is working to strengthen connections with smaller areas in Sweden by intermodal transport. There is a strong sense that the ports feel they need to be proactive and innovative to increase the volume of freight through their ports. Trelleborg Port expressed that the vessel owners were not working sufficiently to promote the port to their customers, and that as a result the port has begun selling to their 'customer's customers' and



arranging conferences to promote and inform an existing and potential customer base. To improve intermodal services, Trelleborg needs to widen up the port working area and is removing buildings to become a combination terminal hub. They have built a new warehouse where trains can be driven inside and offload goods, which additionally serves as a storage area.

5.13 From the regional authority's perspective

Due to the fact, that no interview could be arranged in Sweden, the following perspective is representing the German point of view, the point of view of the Ministry of Transport of the Federal State Mecklenburg-Vorpommern respectively.

5.13.1 Cluster initiatives in Mecklenburg-Vorpommern

As part of the Federal Government in Mecklenburg-Vorpommern it is the Ministry for Economy which is mainly responsible for business development and cluster initiatives. In the Federal State there is a lighthouse project for clusters, the so called Holzcluster (Wooden-industry-cluster) in Wismar. Even though, transport infrastructure did not play a major role in this initiative, the economic development was closely linked to port/port related infrastructure development, as raw materials and semi-materials are transhipped at the port of Wismar and investments have been made to strengthen that.

5.13.2 Reflections on the region and the Port of Sassnitz/ Mukran

With focus on the island Ruegen, the main intention of the Federal State is to keep this region attractive for tourism, which is the leading industry. The Port of Sassnitz/ Mukran together with the City Port Sassnitz are considered important for the region, especially with regard to employment. One of the main potential of both ports is their space capacity. For the future it is anticipated to attract industry there, which has an environmental friendly image ("White Industry"), to do not hamper the tourism industry. Of main interest for this investigation is the Port of Sassnitz/Mukran.



Concerning transport development the link Sassnitz-Trelleborg is seen as an important part of the Baltic-Sea-Adria-Corridor. This corridor will be investigated deeply within the Interreg project Scandria.

The main advantages of the Port of Sassnitz/ Mukran seen by the Federal Government are the free capacities in rail transport on this link as well as the free space capacities in the port. Furthermore, also the road hinterland is well developed respectively there are plans for its development. Also the fact, that there is no need for ship pilots in the channel navigation is seen as competitive factor.

Due to the fact that the Federal Government owns 10% of the port Sassnitz/Mukran, its developments plans as wells as port-related investments are always of interest for the Federal State. Representatives of the Federal State are part of the port's Supervisory Board.

In Germany ownership and responsibility are shared by the Federal States and private companies. The waterways are owned by the Federation. Therefore regional authorities are always involved in port development.

Despite the current development, a very positive development is awaited for the next years. Especially with regard to capacity problems and costs of competing road corridors (also the Fehmarn-Belt-Link), an increase of transport volumes is expected.

5.13.3 Conclusion

To summarize the ideas from this perspective it can be stated, that in general the concept MoS is evaluated as a good concept, especially with its intention to shift transport volumes from road to sea. Thereby the concept fits into the current public interest to strengthen environmental friendly transport and to avoid road congestion, especially in transit regions. The implementation is regarded more concerned. Especially the bureaucracy behind MoS-applications and also during the implementation is evaluated as complicated and not market-oriented. The amount of complementary resources, which have to be distributed by the project partners are often not feasible, respectively maritime industry is subject to a dynamic development, and investment plans have to changed. This is the reason why these kinds of projects have to come from the industry and should not be initiated by an authority. Even though their support is very important for the further steps, the projects should be market-driven.



6 MoS & Cluster Analysis and Assessment

Chapter Summary

This chapter will.....

- Bring together and combine all other discussions and work
- Explore and offer ideas and suggestions for improving hubs and hinterlands to ports
- Explore ways to improve the MoS concept
- Present a Matrix of results
- Discuss the lessons learned examining clusters

This section of the report will bring together and combine all the other discussions and work previously presented. The purpose will be to explore and offer ideas and suggestions for improving hubs and hinterland transport to and from ports, while discussing some of the issues with developing the MoS concept.

In order to simplify the analysis and assessment of clusters and SSS/MoS, we will base our discussions around the four main cluster benefits and aspects which have previously been discussed in the introduction. These are presented below, followed by a description of them.

1. Managerial aspects
2. Structural & Communication aspects
3. Business Development aspects
4. Financial aspects

A visual representation of the chapter is also given on the next page in Figure 26.

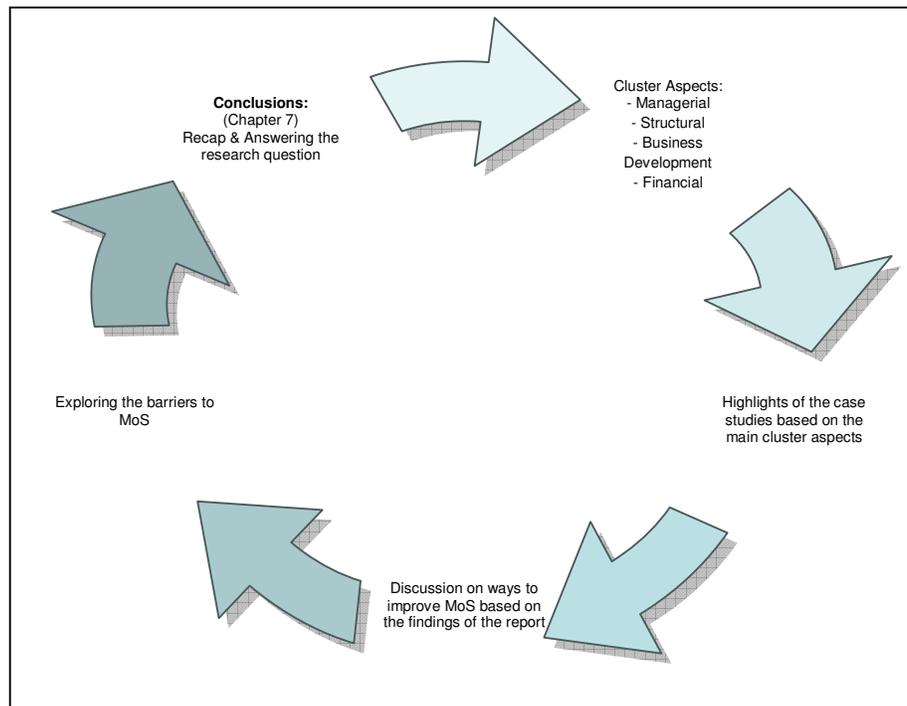


Figure 26: Overview of the Analysis & Discussions Chapter

Managerial Aspects

Cluster management is one of the most important aspects of any successful cluster. The person/organization in charge of a cluster needs to understand the needs of the various organizations that make up the cluster and must also effectively communicate the visions, growth strategy, short and long-term plans and goals of the cluster. These could include such things as expanding the cluster, access to new markets and clients, promotion and marketing or even new partnership opportunities. Managerial aspects also include such things as ensuring quality control within the cluster and offering new start ups guidance and support.

Structural & Communication Aspects

In order to develop successful clusters, a clearly defined governance structure needs to be in place which provides direction and an understanding of the roles and purpose of the cluster. Communication is a big part of this. **Communication** between the various actors within the



network and for outsiders can be the most important factor in determining the success or failure of a cluster. The need to provide effective and efficient communication is vital. Communication can take place between actors via conferences, meetings, newsletters, emails and via a common homepage on the internet. Stating this, someone needs to coordinate the above mentioned efforts and a central person or organization to do this is often seen as the best way to coordinate activities (see managerial aspects). These centres are often supported either fully or partially by local, regional or national governments. Universities also often play a significant role in developing and strengthening clusters.

Business Development Aspects

One of the strongest benefits of clusters is the ability of the members of the cluster to generate economic advantages from each other – termed under the general title “business development aspects”. Some areas where the cluster members could potentially save large sums of money are the use of shared investments for infrastructure and/or IT and joint marketing promotion of the cluster which raises awareness of the individual firm and cluster as a whole. This creates such advantages as economies of scale and economies of scope. Another benefit found when firms are in close proximity to each other is that they can outsource to each other and thus retain valuable contracts and clients by using their networks and relationship developed in the cluster. This is especially important in situations where a firm is busy and may not be able to carry out a certain service or produce a certain product in time for a deadline. Partnerships and cooperation agreements developed within the network could ease problems such as the one mentioned above. Access to highly skilled workers is enhanced with many firms within a similar industry working closely together, combined with the proximity of research institutes, universities and training centres; the attraction of skilled workers to a cluster should be a major part of any cluster’s business plan.

Another important component of cluster are aspects linked to research institutes and other knowledge centres (business associations, private initiatives, etc). Often the local university further supports local industries by developing partnerships and encouraging research to improve business practices or develop new projects. This can be clearly seen in the work being done at the University of Southern Denmark’s Esbjerg campus, which houses the Department of Maritime Research and



Innovation. As shown in the development of the MoS Esbjerg-Zeebrugge case, this department was beneficial for assessing certain parts of the application process and provided the scientific data needed to show the benefits that a new MoS route could bring. This example can be seen as using local knowledge, via the university, which is connected to more far reaching and international expertise and knowledge. In this way, the connections that clusters have with local universities are seen as a vital link and bridging an understanding with best-practice examples and real life practices.

Financial aspects

Financial aspects are very important components of any cluster. Members of a cluster often get advice and search within the group to find out about new funding opportunities that may be available. This privilege does, however, come at a cost - in the form of membership fees that are often charged by the managing organization. Strong clusters can also make outside sources (private investors) interested in investing within the cluster. There are often also possibilities to receive venture capital funds. Government support for clusters is often another source of vital funding and most countries, as already discussed in **Chapter 4** already provide some level of support for clusters and cluster development. The EU is also a big supporter of clusters and has several programmes in place which provide funding for cluster initiatives, such as the Sixth Framework of European Research and Development Programme, which assists clusters with co-financing projects and Europe INNOVA, a group dedicated to developing clusters.

Other Important Points

Although we have chosen not to focus entirely on geographical factors, they are one of the basic underlying components of clusters. There is usually some sort of geographical boundary which defines a particular cluster. Some clusters are geographically defined by a certain physical feature such as a landform or body of water (e.g. Silicon Valley, Øresund Region), while others are defined by a manmade feature such as highways (e.g. the Biotech cluster in Boston, located along Highways I-90, I-95 and I-93). It is generally difficult to put an exact figure on the number of firms needed in order for it to be called a “cluster”, however, for marketing purposes and for sufficient possible synergy benefits, a “cluster” should have enough firms, which allow it to be considered broad and encompassing, with a mix of both private and public sector actors.

The below Figure 27 depicts the interrelations between all the four main aspects focused on in this report. As shown, it can be challenging to separate all the discussed point into pre-defined categories, as there are often attributes found in each example that can apply to several aspects.

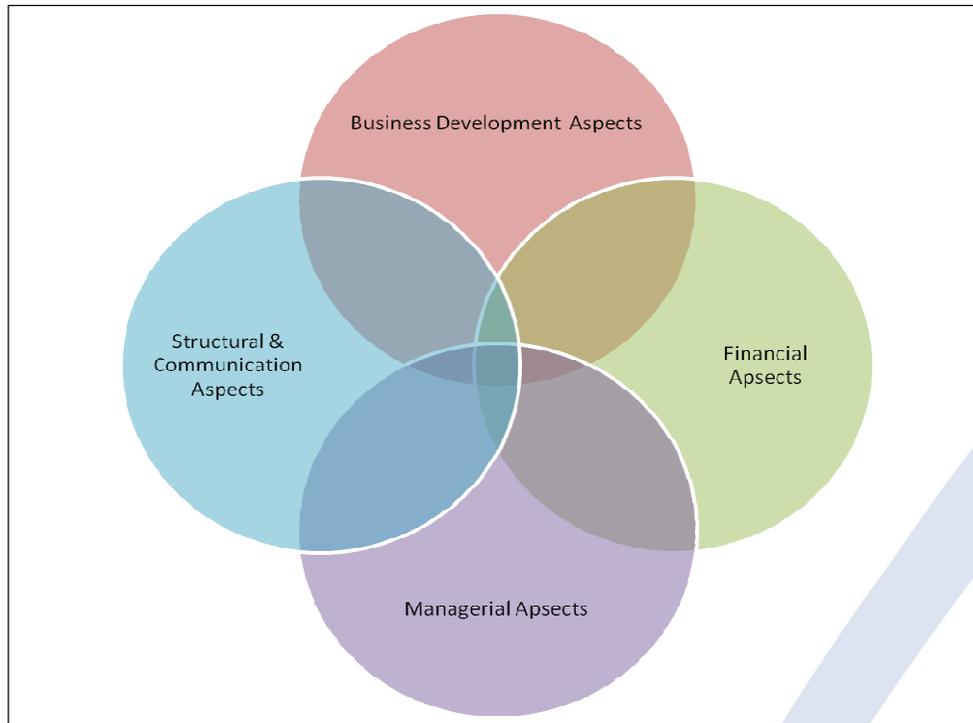


Figure 27: Diagram of the Cluster Aspects

6.1 Matrix

A Matrix of results has been developed which allows the reader to clearly see some of the clusters aspects present in the case studies, in the various countries. Each of the four main cluster case studies were drawn upon to highlight areas where managerial, structural, business development and financial aspects can be seen and the Matrix is a bridge between the previously discussed cluster aspects and what we have learned during the research for this report.

Case Studies	Denmark	Germany	UK	Sweden
Aspects Criteria 3: Managerial Aspects	Copenhagen Tech Transfer Consortium Øresund Science Region National policies are “non-existent” but regions play a stronger role in small clusters	6 national cluster programmes exists PPP BioRN: based on 6 principles – Science and Education, Industry, Infrastructure and Services, Politics & Associations, Finance, and SMEs BiORN management is state of the art in working with successful clusters	Action has been taken from the regional authorities to support the cluster development and this body took the management – though lack of the support from the government, etc.	Growing company base representing the entire value chain from start-ups to production networking, articulating needs/lobbying, collaboration/joint action, education/training and promotion. A number of collaborative projects between actors within the Stockholm region have been created.
Criteria 1: Structural & Communication Aspects	Triple Helix approach Social networks “Hubs” of activities – with high levels of entrance and exit of organizations and individual	Well established structure, coordinating the efforts with the primary role of the BioRN Management (PPP of the local authorities and universities)	Change of the structure – building more network-based relations Companies are eager to implement the innovative ideas	Universities have played a major role in R&D R&D centrally managed (RISE owned by the government)
Criteria 2: Business Development Aspects	Most attractive knowledge-based economic growth centres Common goal and strategy for the Øresund region	Excellent pioneering research being conducted in the Rhine-Neckar region as well as on the presence of the major corporations – clear vision and strategy	Regional agency brings up initiatives – change of the traditional business to meet the market demands Establishment of the Seafood Institute in Grimsby and the Logistics Institute at the University of Hull	Cluster promoting initiative VINNOVA is established and is playing a vital role Well-developed research institutes which put emphasis on facilitating and fostering start-ups and spinning-off new firms
Criteria 4: Financial Aspects	Regional authorities Invest in Denmark Ministry of Science, Technology and innovation Ministry of Economic and Business Affairs Winner of <i>Regio Stars</i> 2008, EU Funds, INTERREG	Cluster Excellence (Federal Ministry of Education and Research) project €200 million Euros over 5 years (2007-2013) – 5 key areas	Councils, EU Funds, European Regional Development Funds	EU funded projects 10-years-lasting cluster programme “Vinnväxt” in 2003, which offers financial support, VINN Excellence Centres” Strong financial sector and availability to venture capital Highly competitive business costs

Figure 28: Matrix of Results



6.2 Managerial aspects

There appear to be some important lessons to be learned for ways to improve the managerial components of improving MoS. It became clear that more data and a better understanding is needed about the effects of certain policies and initiatives. While regional governments undertake cluster management and have programmes in place to promote such development, there is little understanding into how exactly these policies are leading to improved economic conditions. From a transport perspective, regional authorities are not always aware about what goods and how goods are transported around their local roads and highways. As a result, regions should have some means for continuously monitoring and assessing developments in the various economic industries, so they can be better providers and supporters of more sustainable transport choices. This could be in the form of new data management programmes or simply by working more closely with the region's or national statistics office which can provide the latest information, such as, goods flows, etc. This knowledge should in turn be easily communicated to other key stakeholders. This is one of the attractions for firms to join a cluster, in that they can usually get access to the latest information about products, services and new development in their industry. Communication should thus take the form which is all encompassing and which can reach the widest possible audience. This is why it is important for the cluster organisation or the region to have a coordinator and/or a person in charge of communications and marketing.

Building upon the lessons learned from communication, in order for actors, firms and regional authorities to work together more closely, there needs to be more trust between all actors. Trust is an important part of any cluster and project initiative and all partners need to demonstrate their commitment and their understanding of the issues at hand. While clusters have proven to be an excellent source of knowledge sharing and learning opportunity for organisations, this can only occur in an arena where members feel secure and with trusted and committed partners. While it is difficult to pinpoint exactly the level of trust needed to form a successful cluster, cluster managers should become active in building networks and developing existing ones by organisations such things as business workshops, conferences, key speaker events and luncheons where all actors can come together. Frequent meeting and opportunities for discussion are one way organisations can build up trust. It was also noted that the importance of soft measure, such as the above mentioned meeting opportunities, which are seen as important tools to use in developing a region's economy.



In searching for ways to make MoS more attractive, it can be suggested that regions can take a much more proactive role in promoting the use of more sustainable forms of transport for goods. This is already been discussed in the Province of West Flanders, where local officials there want to take a more proactive approach for that region's clusters. While nearly all regional governments have active programmes to attract new firms and investments to their region, few have actively gone behind just "attracting" new firms, such as working with new and existing firms into how their products could be transported using more sustainable forms. We have seen the start of this with the Province of West Flanders and the results of their initiatives there will be interesting to follow in the future. Regional investments are indeed given over for such things as improvements in a regional physical infrastructure, but it can be suggested that a more proactive approach could be made which will assist firms at finding ways of decreasing its transport external costs.

This type of action, is commonly known as transport demand management or mobility management, and is very much in use in many urban areas. Municipal government are often active and attempt to take a leading role in encouraging residents to car pool, take public transport, such as the "Think Metro – take the bus" campaign in the Øresund region. It is our knowledge that this proactive approach does not currently exist with goods transport, on a regional level. Goods transport has proven to be harder to manage, seen from a logistics perspective. There are, however, definite examples of this with large firms, such as IKEA, who have significantly perfected shipments of their products in terms of time savings, cost reductions and using more sustainable forms of transport. This high level of understanding is not, however, possible with many firms and thus regional government can step in here to offer some assistance in this matter. If regions could work with helping to change traditional road-only transport by firms, or assist them with becoming more efficient, then this will go a long way in promoting more intermodal and saw transport, while reducing the region's environmental footprint at the same time.

6.3 Structural & Communication Aspects

It has been learned that it is important to have a leading organisation in charge of managing and building up a cluster. As such, it is important to have a framework in place which guides and forms the cluster. This governance structure will form the backbone to how the cluster organisation carries



out its day-to-day tasks. It is important to reiterate the basic foundation for a cluster in order to ensure that all aspects are covered within the governance structure. These include:

- A dedicated coordinator or manager who is the main contact person
- A clearly defined system for reporting, assessments, decision making and promotion of the cluster. It is important that progress reports are made to members and other interested parties which highlight the achievement and future plans of the cluster

The governance structure is important to be in place so that all members understand the role of the cluster and the various tasks to be undertaken with the key positions within the organisation and by members themselves. We saw in the case of the wood industry in Wallonia, Belgium that many of the firms are small and are specialised in producing certain products. These firms often do not have the time or expertise in dealing with such complex areas such as transport and marketing. This is where a cluster organisation can take a leading role by assisting these firms in developing new markets and jointly forming transport solutions to reduce costs.

Another useful structure which appeared to present some insightful ways into organising various projects and initiative was the Triple Helix model being used in the Øresund region in Denmark and Sweden. The Triple Helix model is based on the perspective of a university playing a primary role in the relationship with industry and government to generate new knowledge, innovation and economic development. Innovation is thereby comprehended as a result of a complex and dynamic process of experiences in the relations between science and technology, research and development inside and through university, industry and government spheres, in a spiral of endless transitions³³.

6.4 Business development aspects

It can be noted from the case studies that regional cluster cases appear to have had greater success than national ones. It appears that clusters managed on the regional level are often more successful and better managed. This may be due to the fact that the people in charge of them are closer to those directly affected by the clusters work, thus making them more engaged and provide an increased

³³ <http://www.triplehelix8.org/about-triple-helix.html>



understanding of the needs of the clusters. This is one reason why it can be important for national and EU funds to be channelled to regional authorities, who appear to have more local knowledge of the needs of their community. In stating this, region's need to invest in creating sound business plans, which include measures to assist the movement of goods off the road to intermodal transport. This is often lacking in regional plans and the entire transport industry and government needs to work harder to include such measures as part of their plans. To address this lack of understanding and improve the overall management of economic development, the Region of Southern Denmark has gone as far as to develop a cluster academy, which aims to train government officials, local leaders and businesses in cluster development and management.

Regional authorities and cluster organisations can become an important link between the developments of new technologies and the matching up with markets for these new technologies. This was the case found in the Region of Southern Denmark, where the Region was actively working with new start up firms in assisting them with creating a demand for their projects. The important lesson to be learned here is that the region was allowing the firms to “break into” the market and to develop new technologies that are seen to be important in the future. Linking this to sustainable transport, the region can assist firms in promoting more alternatives for firms who wish to be environmental conscious. This should be approached as a win-win situation for all partners involved, this way ensuring the success of it from both sides.

The increasing use of information and communication technologies (ICT) should not be underestimated as an increasingly useful and vital tool for improving transport networks. Devices such as Global Position Systems (GPS) can allow firms to track shipped goods, avoid bottlenecks by warning drivers to take an alternative route when there is congestion or a road accident. This can save firms money and reduce transport times. ICT can also be used to better coordinate the transport of goods and services with scheduled sailing times for SSS. The topic of ICT will be further explored in the WP C-3b report.

6.5 Financial aspects

The lessons learned from examining financial aspects can provide some valuable experiences for further developing MoS. It takes time and financial resources to change existing transport systems if



society is to increase the share of goods transported around the North Sea Region in a more sustainable manner. We have learned that cluster organisations are heavily reliant on national and regional government funds, as well as EU structural funds. It is therefore important for those in charge of managing the cluster improvements to be aware of the various programmes and funding sources available, while at the same time maintain or increase a strong funding base from its own members. As part of this, it is important for those managing that visions and goals are continually being re-assessed for the organisation, as economic conditions can change and the visions and goals that were initially made may not apply to the current situation.

It has also been discussed in this report the importance having strong private partners involved in any initiative. Private partners can be one of the most important elements as whether or not a new cluster or new transport network will succeed. The private sector brings with it a host of knowledge and human and financial resources that can often bring more profound changes. In Southern Denmark, the large firm of Danfoss has helped the region to expand cluster initiatives and brought with it much needed attention to their initiatives. It should be noted here that one large actor should not come to dominate the agenda of a cluster, as this would defeat the purpose of working together. Therefore, a balance of public and private actors works best.

6.6 Exploring Barriers to MoS

This short section will explore some more general barriers to developing the MoS concept, based on the interviews with officials at the MoS ports, their experiences with MoS and other findings that were not already discussed in the previous discussions based on the Matrix.

In discussions on the barriers for using SSS, stakeholders identify three main areas which need to be addressed; environmental, administration and port function and size. These will be briefly discussed below.

The Environment

One of the fundamental ideas for shifting cargo off the roads and onto SSS is to shift goods transport onto less polluting modes of transportation. While the potential for pollution reduction are



great, the efforts to accommodate more MoS traffic have their own negative environmental consequences, particular in the vicinity of the port (more traffic, congestion, etc) and these challenges must be addressed accordingly in order to create more problems. Some port officials stressed that Environment Impact Assessments (EIA) can become a major burden for port infrastructure expansion plans. While the general feeling is that all stakeholders wish to do what's best for the environment, EIAs can often add extra months and even years before a project can get final approval from government officials. In Zeebrugge, for example, they had a case where some land was reclaimed and in the waiting period before development could occur, marine life and birds made their new habitat on this new land and then the port was faced with problems when it tried to build on this land. One idea to overcome the long approval process for EIAs is that the positive effects of shifting freight from road to sea should be given more emphasis in them, demonstrating that port development can have wider societal benefits. Alternatively, those government authorities responsible for EIAs could assist with fast-tracking certain requirements in order to reduce delays and time spent.

Administration

Another barrier for increasing SSS can be administration challenges. Shipping goods via the sea bring with it extra paper work and procedures that present a real challenge for firms and forwarders. There is also the problem with the mixing of intra-EU goods and goods from outside the EU, which require even more documents. The use of new technologies such as e-freight and other electronic (and paperless) documentation will make for smoother shipments for all parties involved. How to reduce such administration barriers will not be directly examined in this report, but will rather be the focused of the StratMoS C-4, which aims to explore administration and organizational issues of intermodal and hereunder the MoS concept.

Port Function and Size

There have also been discussions about how we can better define some requirements for a MoS port. As already mentioned, and as seen by the stakeholders in the Esbjerg-Zeebrugge project, the Port of Esbjerg is considered to be the minimum size port needed to become a successful MoS port.



While fairly small, the Port of Esbjerg can offer several SSS routes and services for a wide variety of businesses and export/import of goods. It also had developed good hinterland connections and has received backing from the Danish national government for further developing its intermodal capacities. The EU policy position on support for ports is mainly left to national governments. Not every port can become a MoS port and maybe the time has come for national governments to reassess their own ports and select some key ports, which can demonstrate the ability to bring about a significant difference in promoting more SSS services. In this respect it is useful to know that European ‘gateway ports’ or ‘gateway port clusters’ will be defined in the ongoing review of the TEN-T network. In addition to the above, there are some concerns about the limited scope for firms to choose transport modes of their goods. This was raised in the Port of Trelleborg, where there are only two operators. More choice for firms would bring more competition and service, making the port more attractive and competitive.

6.6.1 Regional Business Strength

It was one of the intentions of this report to explore how, if any, the business strengths of the region played in developing the MoS service at the port. It was found that in general, due to extensive hinterland connections, the areas in the immediate vicinity of the ports of Esbjerg and Zeebrugge play a minimal role in development of MoS routes at the port. Instead, the region’s strengths appear to play more of a role in servicing the hinterland’s production functions, i.e. the port acts as a warehouse and storage hub, some firms near the port service the port activities (maintenance), while others supply the vessels with materials for daily operations of the ships. A similar situation has developed with Sassnitz and Trelleborg, where the local firms supply and provide services to the traffic flowing to the land from the ports, rather than having a large volume of local goods using the new MoS routes.

In Esbjerg, the oil and gas industry rely heavily on sea shipping, but not so much on any specific SSS route. However, increasingly the offshore windmill sector is starting to use SSS in exporting final components to other countries. Windmill blades and components are being stored and shipped via the port while the port has been active in securing the special equipment needed to accommodate this. With the increase in size of windmill blades, it is predicted that more and more



of these blades will have no choice but to use SSS services to reach their final destination. Currently Esbjerg handles over 50% of the windmills produced in Denmark and port officials hope to increase this.

Promoting the further use of MoS has been left primarily in the hands of national Short Sea Shipping promotion centres. Unfortunately, in Denmark, *the Short Sea Shipping Promotion Bureau of Denmark* (SSSPB) is not being fully optimised and is in fact closed down. The European Maritime Centre (EMC), another organization that promotes shipping in Denmark and abroad, maintains contacts for the SSSPB and hopes to get it up and running in the future. The lack of national commitment and funding has stopped the work of the SSSPB. The EMC does work on networking with 6-7 networks related to shipping. One of these networks is related to SSS and the members in this network meet regularly and discuss issues related to SSS.



7. Conclusions

Chapter Summary

This chapter will.....

- Summarize and conclude the findings of the report
- Provide recommendation for how clusters can benefit the development of the MoS concept
- Answers the research questions

The financial crisis has created hard economic times in Europe. There has been a dramatic fall in the numbers of goods being shipped and demand for corresponding services has also been negatively affected. While such a situation brings with it a host of problems and hardships, it can also be used as a time where economic strategies can be reviewed and revised, making them more competitive, more sustainable and more future oriented. This is exactly what we are seeing today, as firms, government and research institutions begin to think and act differently in light of the crisis, in order to mediate the losses from the financial crisis and in order to become stronger, when the crisis passes. This is one

reason why examining the potential benefits of clusters in improving MoS transport and hubs and hinterland connections will go a long way in providing the required improvement in transport and logistics chains.

While cluster policy and management tools are still developing, there is an increasing awareness that much is to be learned from engaging with all stakeholders in more productive and proactive ways. A modern society and economy needs to develop and adapt to the global economy while at the same time it must build up local expertise and develop local resources to become competitive on a global scale. The discussions presented in this report have revealed that there are some areas where clusters can benefit the MoS concept, making the concept more effective and efficient. While there remains some unclear areas about the cluster concept and specifics on how it can directly improve MoS activities, it has been demonstrated with significant measures that tools and ideas from cluster policies can lead to enhanced cooperation, improved networking attributes and provide improved management techniques for regional economic development strategies and policies.

This report has provided some discussions and ideas about how the transport and logistics industry can use and learn from cluster aspects. Cluster case examples from various countries were drawn



upon to explore some of the results of cluster initiatives and to explore areas which showed promise to improving efficiencies and coordination amongst actors in the transport chain. Regional cases were explored, as it appears that regional cluster examples have greater successes in fostering successful clusters. The findings from this report were benchmarked on four platforms – managerial aspects, structural & communication aspects, business development aspects and financial aspects. These aspects made it easier to conceptualise some of the lessons to be learned and should not be considered stand-alone aspects, but rather aspects which can offer suggestions for possible improvements.

In order to answer the main research question below, three broader questions will be answered first which allows for a full comprehension of the issues at hand to be answered completed.

The main research question:

What lessons can be learned from industrial clusters and which ones show potential to stimulate and strengthen MoS activities?

Three questions which provide insight and assistance with answering the main research question will be answered in turn:

1. How can clusters be used to improve the efficiency of current transport policies and initiatives?
2. What tools can cluster managers use in order to develop stronger and more competitive cooperation?
3. How can cluster initiatives be used in broader policies to improve overall economic efficiencies?

How can clusters be used to improve the efficiency of current transport policies and initiatives?

Cluster organizations and the management of them, are seen as a useful part of any economic development strategy. The development of local knowledge by building upon the strengths of a region, plus attracting new players, can go a long way in increasing a region's competitiveness and attractiveness. Local firms and leaders can learn from each other, if there are opportunities available to do so. This is why the support to clusters and cluster management is gaining recognition as an



important tool in providing specific, industry focused, know-how and support. Clusters and cluster managers can also act as a forum or meeting place where the public and private sectors can come together and build up more dynamic relationships. In this way, the public sector, which often does not have the tools needed to effectively engage with private partners can learn from and gain vital knowledge and expertise. This could help governments take a more proactive position when it comes to providing the necessary resources for business clusters to be successful.

It has become clear that what is needed in order to improve connections to and from the ports is more of a behavioural change in the long term strategies of companies and suppliers. Established contracts and commitments by firms to land-only transport have often been in place for many years, making it difficult to change. New shipping routes will often need to be established for long periods before significant volumes can be achieved. New MoS routes are often slow to start-up and not well known, thus lacking the sort of flexibility often demanded by firms. Stating this, many goods which are not time sensitive and can afford to take a bit longer to travel to their final destination, thereby making MoS an optimal choice for their transport solutions.

What tools can cluster managers use in order to develop stronger and more competitive cooperation?

From this report, reviewing cluster examples and discussing some of the issues with people working in the transport industry and economic development, has brought forward some possible suggestions for how those working in the industry can better work together to improve overall conditions and economic prospects of the logistics and transport industry. It is imperative that the transport and logistics industry stays at the forefront of developing sound business practices and using new technologies and services which will continue to reduce costs and improve efficiencies. In this sense, the use of good practices examples and lessons from clusters can be used to change the way of thinking – leading to more innovative ideas, better cooperation and new initiatives which will lead to long term benefits for the entire transport industry and society. In the context of MoS, a programme which has run since 2003, it is now well documented and discussed that there are areas for improvement which need to be addressed if the programme is to continue a further five years, while still having a positive effect of increasing MoS for European goods.



For cluster managers, there still remain many obstacles in developing more efficient cooperation. Such hurdles as administration barriers (procedures, regulations, etc.) work against clustering activities within a cluster. There remains many questions, however, as to exactly how to achieve more integration between firms in a newly formed partnership, such as the already discussed “co-opetition” where firms compete yet cooperate at the same time so that both gain economically.

How can cluster initiatives be used in broader policies to improve overall economic efficiencies?

It appears that clusters can be used to assist with changing the current policy focus on reducing the administration bottlenecks for conducting business, i.e. tax breaks, reduction of administration, etc. to one which assists firms with developing of more sound business policies in such things as educations, management styles, expansion into new markets, etc. These are all areas which have been shown in this report to be areas where clusters appear to work well. Innovative firms and new start-ups often find comfort in working within clusters as they can receive support in several areas from management to financing to know-how. This innovation is also why universities are often linked to successful clusters, in that they can provide the cluster members with research and development capabilities that would otherwise not be possible if they worked alone.

Clusters have also been shown to be a useful means of attracting qualified people with specific skills needed in the cluster industry. As clusters often deliver a specialized service or product, it remains critical for the industry to attract the necessary workforce to carry out these duties. One of beneficial aspect of working in clusters, for members, is that they can jointly pool their resources into areas such as education, marketing and other related means to bring awareness and improve the profile of the cluster businesses. This is often not possible when individual firms work alone.

On the regional level, clusters can become an important component of a region’s economic development plan. Different cluster can be linked together to expand the opportunities for cooperation and benefits regionally. This could also assist with the learning and knowledge development that takes place within clusters, so that there becomes broader regionally benefits for the lessons learned.



Final Remarks

In concluding and answering the overall research question - **what lessons can be learned from industrial clusters and which ones show potential to stimulate and strengthen MoS activities?**

- it can be stated that there are several lessons to be learned which could potentially stimulate MoS activities. While there is no overall concrete solution for what can work best, it remains of great interest for regions to further explore some of the issues discussed in this report which have demonstrated some significant soft measures in creating a more sustainable goods transportation network. As regional authorities in the North Sea area are diverse and have various forms of management and cultures, they will have to be individually considered when examining how to best deal with the high use of road only transport of goods. There appears to be, however, many soft measures which regional authorities can already begin to start and initiate, based on the discussions found in Chapter 6.

In general, it has been shown that there is indeed some appeal in using the cluster theory to make the concept of MoS more dynamic, more efficient and more of a collective initiative by key stakeholders who can jointly begin to change the long standing reliance on road only transport around Europe. This is important, given the current economic crisis, which is forcing all levels of government and business to think differently in order to overcome this crisis and remain strong. This is another reason, why cluster policies, which aim to provide longer-term economic change, can be seen a useful tool in the sense that cluster policies deal with both short-term solutions and long term initiatives for positive change and growth. Having stated this, it must be noted that cluster policies should only be seen as one set of tools to be used in increasing overall competitiveness of MoS activities. Other programmes and initiatives may also hold merit in lessons to be learned for MoS, and these should also be encouraged as well. In addition, the continuing work under the StratMoS project is only now starting to lead to a better understanding about issues surrounding MoS and how to effectively overcome the numerous challenges.



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