

UNIVERSITY OF TURKU

Faculty of Humanities  
Baltic Sea Region Studies

Master's Thesis

TRACING INNOVATION PRACTICES IN SEAPORTS: THE PORTS OF  
KLAIPEDA AND STOCKHOLM AS CASE STUDIES

Ignė Stalmokaitė

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This study explores variegated means through which ports have become increasingly entangled in the planning logic of neoliberal innovation-driven economy. The research topic belongs to the academic disciplines of economics and human geography. The aim of the thesis is to analyse how the notion of innovation, adopted in a variety of supranational and national port policy documents, is deployed in operational port environment in two different ports of the Baltic Sea Region: the port of Stockholm, Sweden, and the port of Klaipeda, Lithuania. This novel innovation agenda is visible in several topics I examine in the study, that is, port governance, environmental issues, and seaport – port-city interface.

The gathered primary source material on port policy documents, strategies, development planning documents and reports is analysed by utilizing the qualitative content analysis research method. Moreover, the empirical part of the case study, that is, tracing innovation practices in mundane port activities is based on collected qualitative semi-structured interviews with port authorities in Klaipeda and Stockholm, researchers and other port experts. I examine the interview material by employing the theoretical reading research method.

In my analysis, I have reframed port-related policy development by tracing and identifying the port transformation from “functional terminals” to “engines for growth”. My results show that this novel innovation-oriented rhetoric imprinted in the narrative “engines for growth” is often contested in daily port practices. In other words, my analysis reveals that the port authorities’ and other port actors’ attitudes towards innovations do not necessarily correspond to the new narrative of innovation and do not always “fit” within a framework of neoliberal economic thinking that glorifies the “culture of innovations”. I argue that the ability to develop innovative initiatives in the ports of Klaipeda and Stockholm is strongly predetermined by local conditions, a port’s governance model, the way port actors perceive the importance of innovations per se, demand factors and new regulations.

Keywords:

Baltic Sea Region ports, seaport innovations, environmental innovations, EU port policy, the port of Klaipeda, the port of Stockholm, port governance, seaport and port-city interface, neoliberal economic thinking, innovation-oriented port policy.

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## TABLE OF CONTENTS

INTRODUCTION .....	1
I. THEORETICAL FRAMEWORK.....	7
1.1 General theoretical framework .....	7
1.2 Central research concepts .....	9
II. DATA AND METHODS.....	16
2.1 Process of data collection .....	16
2.2 Methods of data analysis .....	19
III. DESCRIPTION OF NATIONAL CONTEXTS AND EMPIRICAL CASES.....	22
3.1 Outlining differences in innovation environment in Lithuania and Sweden .....	22
3.2 Concise overview: the ports of Klaipeda and Stockholm.....	24
IV. TRACING <i>INNOVATION</i> IN POLICY DOCUMENTS.....	28
4.1 Ports in EU policy: from “functional terminals” to “engines for growth” .....	28
4.2 The ports of Klaipeda and Stockholm in the Baltic Sea Region policy framework ...	33
4.3 Innovation in Lithuanian port policies: recognised but unspecified concept.....	36
4.4 Innovation in Swedish transport policies: supporting green solutions and sustainability goals.....	39
V. SEAPORT INNOVATIONS: THE PORTS OF KLAIPEDA AND STOCKHOLM.....	44
5.1 Linking concepts of port governance and innovations .....	44
5.1.1 Ports actors’ approach to seaport innovations .....	45
5.2 Environmental innovations in the ports .....	49
5.2.1 Defining environmental innovations .....	49
5.2.2 The port of Stockholm: proactive approach to environmental issues.....	52
5.2.3 Emerging environmental innovations in the port of Klaipeda.....	57
5.3 Port and port-city interface: a medium for innovations .....	60
VI. DISCUSSION: FROM <i>INNOVATION</i> IN POLICY DOCUMENTS TO PORT PRACTICES .....	65
CONCLUSIONS.....	75
REFERENCES .....	80
APPENDIXES .....	98

## INTRODUCTION

The term *innovation* has become increasingly integrated into political discourse, research and the public debate. The need for innovative policies, regulations, technologies, and operating practices has been recognized in multiple arenas (Hall, O'Brien and Woudsma, 2013). Innovations are no longer associated exclusively with institutions of knowledge production. More recently, Hodgson (2013, p. 194) noticed: “innovation is now priority across all policy and all actors: governments, institutions, businesses, and individuals”. Innovations are seen as the “drivers of economic change” (Aoyama, Murphy, and Hanson, 2011, p. 41), as an important factor of competitiveness (Porter, 1990), and as “a mantra and normative ideal for the pursuit of economic growth” (Laven, 2008, p. 14).

Hence, the European Union and national government authorities are adopting policies and recommendations on how to foster the culture of innovation in various sectors which are perceived as having high value for countries' economic growth and competitiveness. The port sector, being part of the value-driven chain system, is also incorporated in the grand narrative of innovation in the EU and national policy documents for infrastructure development. However, what does this mean in practice? How do ports perceive their role of being “innovators” themselves? Are innovations, which are often considered positive from perspective of economic dynamics (Bergh, Truffer, and Kallis, 2011), part of the port's governance and mundane port's activities?

### *Research aim and problematic*

The purpose of this master's degree thesis is to examine how the notion of innovation, adopted in a variety of supranational and national port policy documents, is deployed in port operational environment in two different ports of the Baltic Sea Region: the port of Stockholm, Sweden, and the port of Klaipeda, Lithuania. The study does not aim to compare but rather to explore innovation-driven activities in these two different profile ports through the lens of port governance, environmental initiatives and seaport – port-city interface. In order to respond to the above-mentioned research aim following research questions have to be addressed. First, what linkage between the concept of innovation and port's governance activities is and how the ports' actors perceive the

notion of innovation in general. Second, how the notion of innovation is utilized in the ports' environmental initiatives and what environmental innovation-driven practices in both ports are. Third, what role a seaport – port-city interface for the adoption of innovations in the ports of Klaipeda and Stockholm possesses.

Both ports of the Baltic Sea Region, that is, the port of Klaipeda and the port of Stockholm have a very distinct profile and characteristics what make them very interesting objects for present case study research. The port of Stockholm is regarded as one of the leading ports of the Baltic Sea Region in terms of passenger traffic, whereas the port of Klaipeda is one of the leading ports on the eastern shore of the Baltic Sea in cargo traffic volumes. Therefore, it is interesting to analyse how the neoliberal economic thinking affected the practices of two different profile capital intensive locales, that is, ports situated in an old-style social democracy and welfare state – Sweden, and a newly minded country which re-emerged with the collapse of the Soviet Union – Lithuania.

The core of this research consists of two equally important aspects. On the one hand, tracing the changing notion of innovation in key EU-port-policy documents and outlining the concept of innovation in Lithuanian and Swedish port policies and development planning documents. On the other hand, only examining actual innovation-driven practices in the ports of Klaipeda and Stockholm can secure the delivery of meaningful research results.

Contemplating the notion of innovation in the context of supranational and national port policy documents is important for several reasons. Firstly, while innovations are embraced as “abstract blessings” in the current economic policies, it is not completely clear how and through which mechanisms the notion of innovation is connected to certain economic and spatial contexts (i.e. ports). Secondly, it is not self-evident what practical changes, if any, the adoption of this concept on policy level induces for mundane port practices. Thus, it is at the core of this study to understand interconnectedness between port policy documents which encourage the port sector “to innovate” and actual innovation-driven practices in the ports of Klaipeda and Stockholm.

The empirical part of the study is divided into two sections. The first research section, based on the gathered primary source material on supranational and national port

policies and development planning documents, serves to form the argument and evidence for the widespread use of the concept of innovation at the policy level. The second section, based on the semi-structured interviews conducted with the port authorities and other port actors, assists revealing how the port authority and other port actors perceive the concept of innovation and what the actual innovation-driven activities in two different ports are.

However, recognising the presence of the concept of innovation in multiple policy settings is not as challenging as trying to trace how it is being actualized in the complex port functioning environment and multilayered port governance system. Two problematic issues should be noted. Firstly, the lack of a common definition of the term innovation presents certain challenges for the present research. Some economists admit that defining innovation is very problematic (Greenhalgh and Rogers, 2010). For example, Miettinen (2002, p. 47) in his study on a national innovation system also concluded that: "... innovative activity of a nation is a complex, multifaceted, heterogeneous and ever-changing set of phenomena for which we do not even have satisfactory definitions". Considering the fact that the concept of innovation could be interpreted from various angles, certain challenges for analysing innovation-driven practices in the port sector emerge. The port actors might have diverse understandings of the meaning of innovation and that might have a significant impact upon their responses regarding innovation-driven practices in ports. For instance, some port actors can interpret and relate innovations merely with technological advancements in the port area, whereas others can share a broader understanding towards the concept of innovation i.e. organisational, management and technological innovations.

Secondly, another challenge should be considered. Miettinen (2002) noticed that a "loose catchword", such as the term *innovation* has become lately, could function as a discourse-organising concept at the policy level. However, its existence at the policy level has little or no relevance if it does not spur any changes in practice. In addition, according to Ahlqvist (2014), the generic notion of innovation has turned to be regarded as meta-narrative for policy-making. In other words, even though the concept of innovation is regarded as the bedrock for indicating the policy success among the policy makers, only a few actually consider what the meaning of it is and how it actually functions (Ahlqvist, 2014). Hence, to trace innovation-driven practices in the port sector can become more challenging since recognising the need for innovations, in particular,

as far as the complex port operational environment is concerned, and achieving it are two very different things.

#### *Previous research and relevance*

The volume of literature on seaport-related innovations indicates the emerging interest among researchers in analysing innovation-driven activities in the port sector. The year 2013 became somewhat of a “landmark” when researchers from various disciplinary backgrounds starting from transport economics, transport geography, regional and maritime logistics management fields disclosed their interests towards exploring seaport-related innovations. Recognising that it would be ambitious to find a single answer to such a “breakthrough”, I suggest that one of the reasons stimulating the interest among European researchers to study seaport-related innovations was connected with a changed innovation discourse at EU port policy level. In 2013 the notion of innovation broadened. In other words, EU port policy makers started promoting not only technological but also organisational and management innovations in ports. This factor might have had an impact for the emergence of case studies exploring the role of ports’ organisational and management settings for the adoption of seaport-related innovations.

The first significant case study shedding light upon environmental innovations in US West Coast port gateways can be found in the recent work of Hall, O’Brien and Woudsma (2013). The authors analyse the role of seaport stakeholder cooperation for adoption of environmental innovations in the ports of Los Angeles, Long Beach and the Canadian port of Vancouver. Other research projects by Acciaro, et al. (2013) and Arduino, et al. (2013) examine the factors and conditions under which particular seaport-related innovations have the highest potential to be implemented in the complex port operational environment.

From the perspective of regional economic studies, the works by Hall and Jacobs (2010) and Cahoon, Pateman and Chen (2013) are important from my research position. Hall and Jacobs’s (2010) research draws attention to the role of geographical, organisational, institutional and social proximity for the adoption of innovations in the port sector, whereas Cahoon, et al. (2013) study analyses the role of the port authority as “innovation network leader” in the regional context. Finally, two more papers by De

Martino, et al. (2013) and Parola, et al. (2013) should be included on the list of existing research on seaport innovations. De Martino, et al. (2013) examine complex inter-organisational relationships in the port sector as a precondition for innovation implementation and development. In contrast, the study by Parola, et al. (2013) focuses on analysing the emergence of innovative means of communication reflected in the ports' annual reports.

However, the absence of case studies examining the role of innovations in particular ports is significant. None of the previously mentioned research projects investigated the innovation-driven practices in the Baltic Sea Region's ports. This master's thesis is an early attempt to explore innovations in the port of Stockholm and in the port of Klaipeda through the lens of port governance, environmental initiatives, and seaport – port-city interface. By studying innovation-driven practices in two different Baltic Sea Region ports, this thesis aims contributing to greater understanding on how innovation-oriented port policies are deployed in a certain capital intensive socio-economic-spatial context, that is, a seaport.

I share Miettinen's (2002, p. 119) understanding of the importance of conducting case studies on local practices which "might help us understand innovations, the conditions in which they flourish (or fail) and effective policymaking". Much can be learned about innovations when studying particular localities, especially ones with such intensive economic flows and complex networks as the port sector represents.

### *Structure*

In order to respond to specified research goal, I have organised the research structure in a following order. In the first section, I construct a general theoretical framework according to Giddens's (1979) structuration theory and present the most important concepts which are crucial to the subject studied in this thesis. The second section is dedicated to methodological considerations. I describe the techniques used when collecting the primary source material and conducting semi-structured interviews. I also elaborate upon the qualitative content analysis research method which I have used for coding the gathered primary source material. In section 3 I briefly outline general innovation environment in Sweden and Lithuania and present the key characteristics of the ports examined in this thesis. In section 4, by analysing the supranational and

national port policies, strategies and development planning documents, I trace the increased use of innovation in port policy documents. In the following section 5, based on the semi-structured interviews with the port authorities and stakeholders, I explore the ports of Klaipeda and Stockholm actors' attitude towards innovations, indicate the innovative environmental initiatives in both ports and analyse the port and city-port interface as a condition for successful innovation deployment in the port sector. In the discussion, section 6, I present the research findings and highlight how innovation discourse existing at supranational and national port policy level correlate with actual innovation-driven practices in the ports of Klaipeda and Stockholm. Finally, in the concluding section, I briefly present the outcome of the study and introduce recommendations for further research.

## I. THEORETICAL FRAMEWORK

### 1.1 General theoretical framework

In this section I construct a general theoretical framework which together with the research questions and methods provides the foundation for studying innovation-driven practices in the ports of Klaipeda and Stockholm. According to Silverman (2013, p. 112), “theory provides a footing for considering the world, separate from, yet about, that world ... theory provides both a framework for critically understanding phenomena and a basis for considering how what is unknown might be organised”. Simultaneously, theories are not static; they resemble “living entities” and could be reorganised and modified (ibid, 2013).

In the analysis I utilize the structuration theory introduced by the contemporary British sociologist Anthony Giddens. Even though the initial aim of structuration theory was to inform the research rather than suggest a set of concepts to be applied (Cohen, 1989) the key concepts of time, space, agency and structure have been employed in variety of works of geographers (Dyck and Kearns, 2006).

According to Giddens (1979), the interdependence between action and structure constitutes a basis of social theory. The notion of action or, in other words, agency could be defined as a “stream of actual or contemplated causal interventions of corporeal being in the on-going process of events-in-the-world” (Giddens, 1979, p. 55). In addition, knowledgeability of an individual agent is crucial for the production of social practices (Dyck and Kearns, 2006). Meanwhile, the concept of structure refers to rules and resources which are being “produced” by knowledgeable human agents and which are constantly involved in the production of actions (Giddens, 1979). The duality of structure is one of the key features distinguishing the relationship between agency and structure. According to Giddens (1979, p. 69), “the structural properties of social systems are both the medium and the outcome of the practices that constitute those systems”. Hence, the existing structure may function as both enabling and constraining factor in the production of social practices.

Giddens's (1979) theoretical conceptualization of the interdependence between action and structure closely relates to present research's problematic and, therefore, I employ the concepts of agency and structure in constructing the analytical framework of the subject studied in this thesis. Yet, I would like to emphasize that I do not regard the notions of agency and structure as static elements. I perceive them as "living entities" which I modify and perceive through the lens of my own research.

Following Giddens's social theory of structuration, which study phenomenon of interconnectedness between agency and structure, I perceive the ports and port sector, which is the central subject in this research, as locales created by variety of port actors (agency), that is, port authorities, terminal operators, shipping line companies, freight forwarders, port labour and local polities, to mention but a few. The activities of the port agency are predefined to a greater or lesser extent by existing rules, regulations and available resources, in other words, the existing structure. However, the interaction between agency and structure or, in other words, between port agency and existing rules is a key feature determining circumstantial variations of the produced practices. I argue that the same rules and regulations can lead to distinct produced outcomes at different locales. Due to the limited role of the structure to "actively coordinate and control social systems" (Cohen, 1989), the port agency becomes a key party in producing social practices. Moreover, the port agency's activities also create certain preconditions for certain kind of structures. Yet, the importance of structure should not be underestimated since the structural functions serves both as enabling and constraining factor for the production of practices.

I perceive the notion of structure composed of various rules and regulations through two different angles. Firstly, the existing policies and strategies which promote "culture of innovation" within port sector can be regarded as "soft rules". Secondly, the other rules such as environmental regulations which port actors cannot neglect in their daily operations can be perceived as "hard rules". Hence, I regard the continuous interaction between structural port's properties, that is, various rules, regulations and resources, and port agency, that is, port actors as a medium within which I explore innovation-driven port practices.

## 1.2 Central research concepts

The complexity of the research questions requires the elaboration of the two most important concepts used in the study. These concepts neither belong to the same academic tradition, nor do they spring from a same academic discipline. The key concepts deployed in this research derive from the social sciences such as port geography and economics. Hence, the definition of these key concepts will provide the theoretical underpinning for the subject studied in this thesis.

### *Innovation*

The term innovation is one of the central concepts used in the research. To present the variety of interdisciplinary approaches towards the notion of innovation and to map the concept in its entirety would be beyond the scope of this research. However, to provide a definition and classification of innovation and to shed light on the first studies on innovation is of utmost importance for the present research.

Innovations can be categorised into product and process innovations (Greenhalgh and Rogers, 2010). According to Greenhalgh and Rogers (2010, p. 4) the concept of innovation refers to “application of new ideas to the products, processes or other aspects of the activities of a firm that lead to increased value”. However, according to Edquist (1997 cited in Johnsen, 2012), a broader definition of innovation links not only to product or process innovations, but also includes a new way of thinking and a new form of organization that create economic value. In addition, broader definition of innovation is also provided by Organisation for Economic Co-operation and Development (OECD) and Eurostat (2005, p. 46): “an innovation is the implementation of a new or significantly improved product (good or service), or process, a new marketing method, or a new organisational method in business practices, workplace organisation or external relations”. This master’s thesis operates with the latter definition of innovation.

Scholars who have studied innovation in various settings (Arduino, et al., 2013; Laven, 2008; Johnsen, 2012) indicate that one of the first studies on innovation dates back to the 1910s. Joseph Schumpeter is mentioned as being one of the first authors who focused on analysing the role of individual entrepreneurs in the production of innovations. Since the seminal work of Schumpeter, the views on what the driving force

behind the production of innovations is have been shifting constantly. According to Laven (2008), the role of firms and organisational networks attained considerable attention among the scholars interested in exploring processes in which innovation occurs. Finally, the “breakthrough” in innovation discourse during the 1980s and 1990s offered new perspectives to analyse processes in which innovation occurs.

The concepts “national system of innovation”, “regional innovation system”, “clusters” and “triple helix” shed new light and brought new perspectives to innovation research. According to Miettinen (2002) and Edquist (2006), the concept “national innovation system” was introduced by Freeman in 1987 and further developed by a Danish economist Bengt-Åke Lundvall, and American economist Richard Nelson. The concept of national system of innovation encompasses a wide array of factors from organisational, social, political, and economic ones as being important elements of innovation (Edquist, 2006). According to Hekkert, et al. (2007, p. 414): “the concept of “innovation system” is a heuristic attempt, developed to analyse all societal subsystems, actors and institutions contributing in one way or the other, directly or indirectly, intentionally or not, to the emergence or production of innovation”.

Meanwhile, the term “regional innovation system” and “clusters” emerged in scholarly considerations in the 1990s. The main idea behind the new terminology was that reducing the concept of national innovation system to a regional level might help companies and industries operating at the regional level to gain a competitive edge (Miettinen, 2002). Finally, a new approach emphasizing the relationship between industry, academia and state as a spur to develop innovative ideas, known as the “triple helix” model came into being in the 1990s.

Hence, attention towards exploring innovations in various frameworks has been growing steadily in scholarly research since the beginning of the 1910s. However, the problematic of measuring innovation and what factors determine the success of innovation is still being debated in academia. Moreover, there is no single universal definition of what innovation actually is.

Nevertheless, considering the research’s goal to explore innovation-driven activities in ports, it is important to specify what I mean by seaport innovations. I share Hall, et al. (2013, p. 88) understanding of the concept of innovation: “Innovation includes new technologies and processes for handling and moving cargo, mechanisms for planning

and policy making, as well as financing, implementing, upgrading, managing and operating infrastructure systems”.

Following the rhetoric of the latter definition, it should be emphasized that port actors do not necessarily create innovations themselves. Port actors can apply already existing technological or process innovations. Considering the complex port operational environment, the latter preference might sound more realistic. According to Hall, et al. (2013, p. 88), the process of innovation adoption in port sector is not straightforward because it involves “balancing and negotiating the often conflicting demands of interested parties”. However, the question whether port actors produce innovations or not, is not as meaningful as considering how the existing innovations are set in and how port actors condition the use of innovations.

Finally, it is crucial to consider the factors that might spur adoption of innovations within port sector. There is an existing approach among the researchers exploring innovation dynamics that not only supply-driven but also demand-driven factors can be the potential source of innovation. Schmookler’s concept of “demand pull” factors contributing to the creation of innovations has been accepted by economists (Kleinknecht and Verspagen, 1989). Edler and Georghiou (2007) also agree that new requirements and demand are the main source of innovations; the scholars present a taxonomy of innovation policy tools categorising them into supply-side and demand-side measures. In addition, Edler and Georghiou (2007) indicate several demand-driven innovation policy measures such as systemic policies, regulations, public procurement and support of private demand which can help to foster innovations.

In my research I apply the demand-side innovation policy tool framework suggested by Edler and Georghiou (2007). In the framework I focus on two factors, namely regulation and support of private demand, and take them as key elements that have the potential to influence port actors to adopt innovations. For example, stricter environmental regulations might become stimulus for constructing an “innovative” infrastructure in port sector corresponding to new environmental requirements. In addition, tax incentives, which Edler and Georghiou (2007) placed in the “support of private demand” category, could be another demand-side initiative undertaken by port actors.

On the other hand, the demand-side factors cannot be taken for granted since they might lead to different outcomes in each country or region: “There are locations where populations are more inclined to purchase and apply innovation than those from the other regions ... . Some countries are more internationally competitive in the areas in which they display challenging, future-oriented and international leading demand” (Edler and Georghiou, 2007, p. 955). Thus, the analysis of innovation-driven practices in the ports of Klaipeda and Stockholm will have to take into account the overall innovation environment within a country primary and consider ports’ profile in general as secondary to this.

### *Port*

The definition of the term port has been constantly evolving together with the advancements in maritime technological developments, integration of ports in the intermodal transport system and the increased emphasis on port as being the growth pole for national and regional economies (Chlomoudis and Pallis, 2002). According to Voorde and Winkelmanns (2002), a notion of seaport depends considerably on the diversity of terminals that are located in the port area and a level on which they are integrated in transport and production chains.

Ducreut (2009) suggests that ports could be approached either from optimistic or from pessimistic perspective. According to former notion, the ports are viewed as engines for local and regional growth, whereas the latter perspective suggests approaching the port merely as place responding to the existing demand in passenger and freight flows (ibid, 2009). For example, Talley (2009) in his study on port economics provides quite generic description of a port:

“A port (or seaport) is a place at which the transfer of cargo and passengers to and from waterways and shores occurs. The transfers are made to and from vessels. The port may be a cargo port (handling only the transfer of cargo), a passenger port (handling only the transfer of passengers), or a combination cargo/passenger port” (Talley, 2009, p. 1).

On the contrary, an example of optimistic approach suggests perceiving a port as a business unit, regardless its governance model or ownership (Masievic and Valiucko,

2000). Commercial activities of a port are emphasized in a definition suggested by Chlomoudis and Pallis (2002). According to the authors a port is:

“Terrestrial and seaside consisting of specific constructions and equipment so as to enable the deployment of commercial activities with the main functions being ships’ reception, loading, transloading, warehousing, reception and delivery of goods via inland transport modes and the boarding and transportation of passengers. Within the confines of those areas, several enterprises operate and utilise the available port infrastructure and superstructure, as well as conventional road and railway infrastructures. Additionally, the port market is regulated or administrated by a port authority” (Chlomoudis and Pallis, 2002, p. 3-4).

Considering the research problematic, I utilize the optimistic approach to port. In other words, I perceive a port not merely as a spatial unit where passenger and cargo flows are handled, but as a community composed of different actors who constantly seek to create and capture value, respond to increased customer demand, urban and environmental challenges.

Apart from port’s definition, it is important to elaborate upon the theoretical underpinnings existing in scholarly research concerning the classification of ports. Ports can be classified according to their size, geographical location, management activities, operation and employment (see Figure 1).

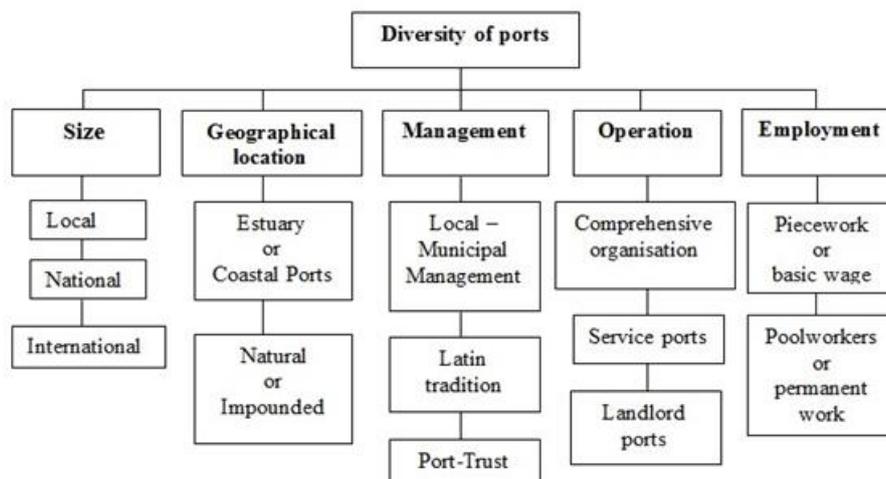


Figure 1. Diversity of ports (Source: Pallis, 1997 cited in Chlomoudis and Pallis, 2002)

Diverse ports can be found not only among different countries but also within one country. The port classification suggested in Figure 1 provides rather general picture and does not indicate that each port can be strictly “fitted” in one of those categories suggested above. Moreover, due to the changes in port economic environment some of the categories tend to be abandoned over the course of time.

As far as the port management practices are concerned, scholars tend to distinguish three different traditions. According to Chlomoudis and Pallis (2002), the local or municipal management activities are influenced by “hanseatic” tradition corresponding to active municipality’s role in port’s management activities. The “Hanseatic” tradition is mostly prevalent in north-western Europe. The second, Latin tradition, is characterized by central governments intervention into port’s management activities and is typical to Mediterranean countries (ibid, 2002). The third, port trust tradition, was observed in Great Britain ports but after the process of privatization tends to be abandoned (ibid, 2002).

According to Talley (2009), a port’s management activities, ownership and control of operations in a port area can be summarized in one word – port governance. Each governance model has distinctive features which presuppose the intensity of port authority’s presence in the provision of port services, infrastructure and superstructure (Chlomoudis and Pallis, 2002).

As regards the categories of port governance, scholars do not have a common agreement. For example, differently from the classification provided by Chlomoudis and Pallis (2002), other researchers tend to suggest four main categories of port governance: service port, tool port, landlord port, and private service port (Brooks and Cullinane, 2007). However, the majority of the world ports belong either to one of the following categories: fully private, fully public or mixed (ibid, 2007).

The service port model can be found in developing countries. A distinctive feature of the service port model is that a port’s land and all port’s assets are owned and controlled by a government (Talley, 2009). One of the weaknesses of this port model is that there is little place for innovative management (Brooks and Cullinane, 2007). Moreover, a private sector’s involvement in port’s operations is limited or not present at all. Unlike in the previous model, in the private port model port’s land and infrastructure is owned

by a private sector. In addition, port's operations can be leased to other private companies (Talley, 2009).

The landlord port "is to be the most common model of allocating public versus private sector responsibilities in the provision of port services" (Brooks and Cullinane, 2007, p. 408). The landlord port is owned by a government, whereas its management activities are undertaken by a port authority. A port authority leases a port's land to private companies who are responsible for maintaining and developing port's superstructure, whereas a landlord port authority is responsible for the long-term development of a port land and for the maintenance of port infrastructure (navigational routes and channels, hydrotechnical installations, quays, electrical installations, access roads) (Paulauskas, 2011). Similarly to the landlord model, private and public sector's involvement in port operations occurs also in the tool port model. However, unlike the landlord port authority, the tool port authority owns and maintains both port's infrastructure and superstructure, whereas stevedoring labour can be provided by a private operator.

Hence, the relationship between private and public sectors' involvement in port operations and port's ownership have to be taken into consideration when analysing innovation-driven activities in the port sector. It goes without saying that private ports have greater flexibility in adjusting to changing market conditions. Thus, they might also become "the role models" in deploying innovative technology and applying innovative management and organisational instruments within the port sector.

## II. DATA AND METHODS

### 2.1 Process of data collection

In the present study, I focus on analysing supranational and national port policies and development planning documents and exploring innovation-driven practices in the ports of Stockholm and Klaipeda. Therefore, during the data collection process I centered my attention both on searching for the European, regional and national port policy documents which employ the fashionable innovation concept and on conducting semi-structured interviews with the port authorities and other experts.

I collected the documents, policies and reports using the desktop (internet) research technique, which Gritsenko (2014) describes as being a contemporary type of archival data collection method. Nowadays, numerous primary source materials such as legal documents, communications, conference documents, presentations and policy documents are to be found online. Thus, I “extracted” the key documents used in the present study from the EU, Swedish and Lithuanian government websites.

If the first part of data-acquiring process addressed the collection of already existing primary source material, the second part, conducting qualitative semi-structured interviews, corresponded to the production of primary source material. During the second data collection phase, I conducted ten semi-structured qualitative interviews, lasting from 45 min to 90 min with experts from Sweden and Lithuania: port authorities in Klaipeda and Stockholm, researchers from innovation and maritime fields, representative from the City of Stockholm and other port actors.

Considering the research goal and problematic, my supervisor and I decided that conducting semi-structured interviews with port authorities and other port experts could be the best way to fill the existing gap in knowledge concerning innovation-driven practices in both ports and to explore the ports actors’ attitudes towards innovations per se. According to Kvale (2007, p. 11), a semi-structured interview:

“attempts to understand themes of the lived daily world from the subjects’ own perspectives ... . It comes close to an everyday conversation, but as a professional interview it has a purpose and it involves a specific approach

and technique; it is semi-structured – it is neither an open everyday conversation, nor a closed questionnaire”.

The form of a semi-structured interview, unlike the structured or unstructured interview, allows for the preparation of content-focused guides which I employed during the conversations with port experts. Simultaneously, the design of a semi-structured interview enabled me maintaining the process of questioning in a flexible order depending on the way in which questions were addressed by the interviewee (Dunn, 2010). In addition, the flexible order of a semi-structured interview allowed me to learn about the other issues proposed by the interviewees that had not been included in the content-focused guide but turned to be important and related to the subject studied in this thesis.

However, the content-focused guide used during the semi-structured interviews also had its own drawbacks. According to Dunn (2010, p. 104), the content-focused guide “requires good communication skills and a great deal of confidence. Any loss of confidence or concentration may lead to an inarticulate and ambiguous wording of questions”. Some of the interviews with the experts were challenging and in order to secure the delivery of meaningful answers I had to reformulate some questions in order to avoid ambiguous messages. Moreover, depending on the respondent’s expertise area each interview required me to prepare a new content-focused guide.

I have chosen to contact the majority of the interviewees after conducting research on publicly available information online. Before choosing a candidate, I considered two important factors: respondent’s position within an organisation and area of expertise which would be relevant to the subject studied in this thesis. Moreover, I made a decision to interview different actors who are connected with the port sector from different angles: port authorities, researchers and representatives of city or maritime transport administration. According to Rubin, et al. (2005) researching the phenomena from separate yet overlapping angles decreases the possibility of drawing hesitant conclusions and allows one to make more informative analysis.

Reaching the key persons occupying high positions within an organisation was a demanding and challenging task. Nevertheless, the majority of the experts were willing to contribute to the study. Furthermore, some of the interviewees voluntarily gave further contact information of other key persons within the port sector who might have

relevant expertise in connection to the research agenda addressed during the interview. Thus, I contacted a few more respondents using the snowball method (Noy, 2008) or, in other words, through the personal network of previously interviewed experts.

The majority of the interviews took place in conference meeting rooms or in the respondents' offices. However, I also interviewed some experts in public areas such as restaurants or coffee places due to their very intensive working schedule at the time of the research. Thus, the choice to conduct semi-structured interviews during lunch time was found to be the most optimal form. In addition, I used two languages, English and Lithuanian, for conducting the interviews. I also introduced all of the interviewees with the purpose of the interview and research aim. Moreover, all respondents gave their permission to record the discussion and use the interview material in the present research.

Gritsenko (2014, p. 72), referring to Gläser and Laudel (2010) in her research, defines the "experts" as "people who possess special knowledge of social phenomena" and classifies the expert interviewing process into two categories: 1) gaining information or technical clarification 2) receiving expert opinion. The goal of the semi-structured interviews for this particular research was twofold. On the one hand, the experts provided the information and clarification of the studied subject which cannot always be found in textual data, such as existing power relationships among the port authorities and the port stakeholder groups. On the other hand, the interviewees provided their opinions and insights on the key questions important for the analysis of innovation-driven practices in the ports of Klaipeda and Stockholm.

Following the framework suggested by Dunn (2010), the questions addressed during the interviews for this particular research could be categorised into three main groups: asking for description (knowledge building), opinion or requesting storytelling. Hence, three main prevalent question groups could be identified: firstly, ones exploring port actors' perceptions of the term innovation in the port sector, secondly, ones trying to discover innovation-driven activities in the port sector, and thirdly, ones exploring the intensity of cooperation activities between the port actors and port-city administration. Moreover, the interviews with the port authorities also covered questions concerning the general port governance system, on-going projects and challenges for future port development planning.

Finally, it should be acknowledged that the quality of the interview depends not only on the knowledge of the interviewee but also on the interviewer's preparation for the interview. Also, "the art of hearing data" (Rubin and Rubin, 2005) during the interview becomes of utmost importance for the quality of the interview. Moreover, the fact that the interview process could be influenced by asymmetric power relationships should be considered (Dowling, 2010). In this research, the respondents occupied high positions within their organisations; thus, the nature of interaction and the responses might have been influenced by the respondent's role within an organisation and that had to be taken into consideration when analysing the collected data.

## 2.2 Methods of data analysis

The primary aim of the analysis is to reveal how the concept of innovation, adopted in various supranational and national policies and port development strategies, is deployed in the ports of Stockholm and Klaipeda environment. The whole research strategy is based on a case study design. According to Yin (2003, p. 2), a case study approach is the most suitable when the researcher poses "how" questions, has little control over the studied phenomenon, and when the research problematic is closely linked to exploring present-day situations: "the distinctive need for case studies arises out of desire to understand complex social phenomena". Moreover, a case study strategy enables one to employ mixed research methods.

Hence, considering the research aim and the gathered source material, I applied mixed research methods in the analysis. I utilized the qualitative content analysis research method in order to analyse supranational and national port policies and development planning documents. Meanwhile, in order to "extract" relevant information from semi-structured interviews I employed the theoretical reading research method.

The qualitative content analysis research method is one of the most widespread research techniques used in qualitative studies which provides relevant tools to analyse the words, meanings or phrases written in a text (Berg, 2004). It involves both describing data within the chosen categories and enables one to proceed further with the analysis of categorised data (Brewer, 2003). According to Julien (2008), the content analysis

research method is also used to analyse a wide range of textual data, including official reports and policies.

One of the advantages provided by the qualitative content analysis research method is that it does not require employing the hypothesis-testing design and makes the research process open to the incorporation of new insights (Gritsenko, 2014). In addition, it helps to reduce a considerable amount of textual data into smaller categories corresponding to the research questions (Cope, 2010). Yet, one of the critiques behind the research method is that in complex research, the content analysis method becomes more challenging, difficult to describe and justify (Payne and Payne, 2004).

Considering the problematic of present research, I found the content analysis research method to be the most appropriate research technique for the analysis of supranational and national port policy documents. It allows for exploring meanings of innovation rather than solving discourse puzzles within a text what the textual analysis research method suggests. Hence, the content analysis research method enabled me to explore practical meanings of innovation within policies and strategies independently from a text.

To make it more complex, I utilized the qualitative content analysis research method in section 4 in order to reveal the increased use of the concept of innovation within EU and national port policy documents. During the initial phase of coding, I set the goal to extract the words “seaport” and “innovation” from EU port policies and strategies. In order to trace the words within the policy documents I had to follow a very technical procedure. By examining a variety of EU policies, communications and strategies in connection to ports, I was able to select and identify the words, central to the subject studied in this thesis. Tracing the terms “seaport” and “innovation” in various policy documents enabled me to recognise a changing pattern in the use of those words within the policy documents.

After I have identified the central concepts and their meanings, I proceeded in analysing the key EU port policy documents which reflected the changing notion of “ports” and “innovations”. Pattern recognition enabled me to build an argument upon the broadened notion and increased use of the concept of innovation in EU port policies and strategies. In addition, I was able to advance my analysis further and depict the use of innovations in national policies and port development planning documents.

Apart from the content analysis research method, I also employed comparative analysis research method in section 3. Even though the goal of the research was not to compare the innovation performance in two different ports, the comparative approach assisted when introducing different innovation environments in Lithuania and Sweden and when presenting the diverse profiles of the ports of Klaipeda and Stockholm.

The data, collected during the interviews, analysis began by transcribing semi-structured interviews in a written form. The further data analysis framework was influenced by a nature of the interviewee responses. In other words, the reason behind conducting the interviews was twofold: to obtain information and technical clarifications and to receive expert opinion upon the studied phenomenon. As far as the former reason behind the conduct of the interviews was concerned, I did not apply any analytic techniques in order to analyse the interview material. I regarded the respondents as experts whose insights and clarifications contributed to the knowledge building on the subject studied in this thesis.

On the contrary, in order to analyse expert's opinions, views and perceptions I employed the qualitative interview technique described as theoretical reading. According to Kvale (2007), some studies leading to new knowledge do not necessarily have to develop systematic analytic tools in order to analyse the interviews. Hence, considering the case study strategy which implies that researcher has little control over studied phenomenon, I decided to approach the port authorities' and other port experts' views as a theoretical reading. In other words, I treated their answers as components of the present research and provided theoretically informed reflections upon them.

Due to ethical reasons, I divided the interviewed respondents into three main categories according to their area of expertise. Instead of introducing and referencing to their real names I applied in the study more generalised titles such as researchers, policy makers and port authorities. In addition, I employed in the research following referencing style i.e. Interview no. 1, Interview no. 2.

### III. DESCRIPTION OF NATIONAL CONTEXTS AND EMPIRICAL CASES

#### 3.1 Outlining differences in innovation environment in Lithuania and Sweden

This section provides a bird's-eye view on general innovation environment in two home countries of the ports of Klaipeda and Stockholm. According to Arduino, et al. (2013), the positive overall socio-economic environment is essential for successful innovation deployment. Hence, I argue that the local national environment has a considerable influence upon how private or public enterprises perceive the importance of innovations and the role of being “innovators” per se.

The discussion about innovations, innovation environments and the ports role in it is heavily conditioned by a policy ideology of neoliberalism. This ideology, which influence has been steadily growing since the 1980s, has become “the hegemonic mode of discourse” cultivating the rhetoric of various policy documents (Harvey, 2005). In addition, the logic of neoliberal ideas, imprinted in various policies, promotes competition, stimulates various actors to search for new products, production methods and new organisational forms (ibid, 2005).

Sweden, the representative of the old-style social democracy and welfare state, and Lithuania, a newly minded country which re-emerged with the collapse of the Soviet Union, have been also affected by the neoliberal economic thinking (ibid, 2005). The rhetoric of the importance of innovations for national growth and competitiveness in Sweden especially increased with the breakthrough of innovation system concept in the 1990s (Eklund, 2008). Meantime, in Lithuania the efforts to promote innovations on national level started in the 2000s (Vidickiene, [2006]). Thus, the historic developments, on the one hand, and the differences in timing to adopt the concept of innovation on a national level as a tool promoting public and private sectors “to innovate”, on the other hand, might had an impact upon the creation of the positive socio-economic environment for the innovation deployment in both countries.

According to the latest available information on innovation performance rankings among the EU member states, an extensive gap between innovation performance in Sweden and in Lithuania exists (See Figure 2, p. 23). Sweden is presented as a leading country in innovation performance, whereas Lithuania falls under the category of

“moderate innovators” (Hollanders and Es-Sadki, 2014). However, as an interviewee from Sweden’s Innovation agency VINNOVA noted, the statistical data upon the innovation performance are somewhat indicative since “it measures the number of factors which are believed to influence the national strength in innovations and not only the output” (Interview no. 10). Recognising the complex nature of innovations and difficulties in measuring innovations per se, the statistical data can help at least approximately determine general “innovation climate” within a country. The rankings provided by the EU Innovation Scoreboard which present considerable differences between Lithuania and Sweden in innovation performance should be taken into consideration when conducting the further analysis on innovation-driven practices in the port of Klaipeda and the port of Stockholm.

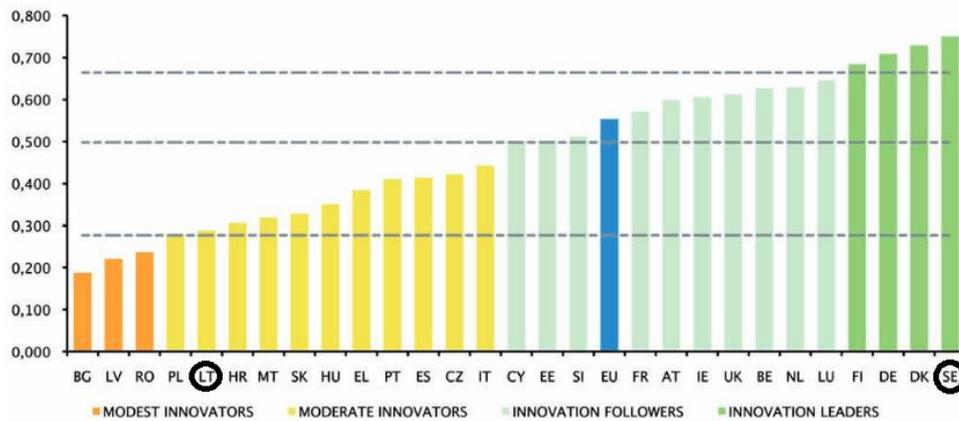


Figure 2. Innovation performance in EU Member States (Source: Hollanders and Es-Sadki, 2014)

Another important factor which should be considered is general innovation climate in the transport sector. The ports, being service providers for shipping operations, are an integral part of the transport system. Hence, the installation of innovative technologies in ships can have a direct impact upon port’s infrastructure development planning (i.e. cold-ironing, LNG bunkering). While exploring the conditions under which innovative concepts has a chance of being adopted within a seaport sector Arduino, et al. (2013, p. 97) emphasized that “transport sector scores less than the average for the economy as a whole when it comes to innovations”. In addition, as far as transport innovations are concerned, the countries like Sweden, having a good climate for innovations in general, also tend to score below average (ibid, 2013).

Thus, one can make a conclusion that considering general innovation framework, the transport sector is less likely to spur innovative services, products or innovative modes of organisation and management. This trend can also affect the other actors involved in the transport chain system (i.e. ports). However, to make this presumption without analysing a particular port portfolio and actual innovation-driven activities within the port would be inconclusive. Yet, noticing the differences between Lithuania and Sweden in innovation performance in general and being aware that transport sector is less likely willing “to innovate” than other sectors becomes an important point of departure in exploring innovation-driven activities in the ports of Klaipeda and Stockholm.

### 3.2 Concise overview: the ports of Klaipeda and Stockholm

Two Baltic Sea Region countries Sweden and Lithuania have profound differences considering the number of ports. The port of Klaipeda is the only port in Lithuania, whereas, according to the statistical data of 2013, Sweden has over fifty ports in terms of container, liquid and bulk cargo handling operations and sixteen ports that provide services for international passenger vessels (Wahlström, et al., 2014).

The port of Stockholm is one of the leading ports in the Baltic Sea Region in terms of passenger ferry destinations, whereas the port of Klaipeda is one of the leading ports among the Baltic States in terms of container shipping, liquid and bulk cargo turnover (see Appendix 1, pp. 98-99). Both ports distinguishes one from another in terms of ownership, governance model, annual passenger and cargo traffic turnover (see Figure 3, p. 25) and strategic port development priorities, to mention but a few.

According to Liu (1995 cited in Caldeirinha and Felicio, 2014, p. 531) the port ownership is an important factor that affects port’s performance: “Under public management, there are not enough incentives to improve the performance like in privately managed ports which have profit-driven objectives”. Considering the port of Stockholm, the port is managed by the private company owned by the City of Stockholm. In other words, the port of Stockholm is the part of Ports of Stockholm Group consisting of subsidiary companies the port of Nynäshamn, the port of Kapellskärs and the parent company port of Stockholm (Ports of Stockholm Annual

Report 2013). The present study examines only the port's of Stockholm innovation-driven activities. The practise of municipality ownership is quite common among ports in Sweden (Paulauskas, 2011). One of the municipality owned port's advantages is that port's development planning and extension possibilities can be implemented in a more flexible manner (ibid, 2011).

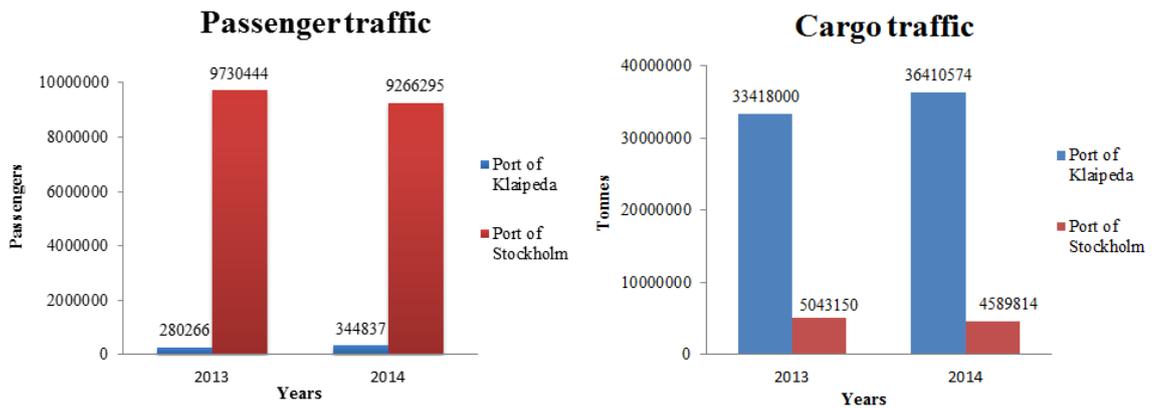


Figure 3. Annual turnover in the ports of Klaipeda and Stockholm (Wahlström, et al., 2014 and the statistical data provided by the ports of Klaipeda and Stockholm) (author's compilation).

Considering undertaken operations, the port of Stockholm contains several important areas (see Appendix 2, p. 100). Ferry traffic activities to several destinations in Finland, Baltic States and Russia take place from Värtahamnen, Frihamnen and Stadsgård terminals, whereas the services for the cruise vessels are provided in Frihamnen, Stadsgård and Skeppsbron locations. According to the latest available information, the current container terminal at Frihamnen and Loudden terminal, which provide services for the vessels supplying the oil products and coal, is planned to be relocated to the other areas outside the port of Stockholm (Port of Stockholm, 2013).

The management activities of the port operations are based on business planning (Ports of Stockholm Annual Report, 2013). In 2013 the port of Stockholm set new targets with the focus on sustainability agenda. As stated in the Ports of Stockholm annual report (2013, p. 10), the port's vision for 2030 is to become "a number one Baltic Sea port – a business promoting and welcoming partner with the focus on sustainability".

The port of Stockholm governance structure corresponds to the tool port governance model (Interview no. 5). In other words, the port of Stockholm infrastructure and the major part of superstructure is owned by the municipality, whereas the stevedoring

labour is undertaken by a private company. According to the tool port model, the port authority is allowed to lease a part of the port's infrastructure or even some part of superstructure to business companies. However, the tool port governance model is effective until the annual cargo turnover does not exceed 7 million tonnes per year. If the annual cargo turnover reaches 8-10 million tonnes, the tool port governance becomes not effective (Paulauskas, 2011). As a result, some municipalities transfer the port management system to landlord governance model (ibid, 2011).

According to Puidokas and Andriuškaite (2012) study, the port of Klaipeda is the most important transport element positioning Lithuania as a maritime country. As noted in the national long-term infrastructure planning programme 2014-2022, the port of Klaipeda is the unique intersection point in Lithuania connecting the sea, road, rail and inland water transportation (Lietuvos Respublikos Vyriausybė, 2014). In addition, the port of Klaipeda operational activities creates social and economic benefits not only to the city of Klaipeda, but also to its region and country at large. The port of Klaipeda activities constitute approximately 4.5 proc. of annual country's GDP (ibid, 2014).

The port of Klaipeda contains several important locations in terms of providing services for vessels: the cruise ship terminal located in near proximity from the old town of Klaipeda, the liquid natural gas (LNG) terminal, the Klaipeda Central terminal constructed in 2014 which is capable to accommodate cruise, passenger and ro-pax (vessels transporting wheeled transport and passengers) ferries, and the container terminal, to mention but a few (see Appendix 3, pp. 100-101) (Port of Klaipeda, 2015a).

Considering the amount of ro-ro (vessels carrying wheeled cargo) cargo loaded in the port, the port of Klaipeda is the leading port on the eastern shore of the Baltic Sea, whereas in terms of passenger carriage the port of Klaipeda is considerably lagging behind the other countries of the Baltic Sea Region (Smart Continent, 2014). However, one must take into consideration a fact that until 2014 the port of Klaipeda did not have a passenger terminal which could provide necessary services for the passengers calling to the port of Klaipeda by ro-pax vessels. In addition, the city factor per se should also be considered. That is, the port of Klaipeda, unlike the other ports of the Baltic Sea Region such as the port of Riga, the port of Tallinn or the port of Stockholm, is not situated in the capital region which might have an influence upon the decision when choosing the country of destination (Interview no. 5).

Differently from the port of Stockholm, the port of Klaipeda is the state-owned enterprise. The port of Klaipeda authority executes the functions of landlord, the most spread governance model among the EU ports. In other words, the port of Klaipeda authority owns the port land and is responsible for the maintenance and development of the port infrastructure (Paulauskas, 2011). On the contrary, the port's superstructure is owned by private companies which rent the port's land under certain conditions from the port authority. Hence, according to landlord port model, the port terminal services and stevedoring labour is provided by private companies which also have the responsibility to maintain and develop port's superstructure (ibid, 2011). In addition, the commercial activities of the companies situated in the port area are clearly separated from the management activities of the port authority.

Nevertheless, certain challenges for the port authority operating under the landlord port model appear. Even though the port of Klaipeda went through the process of commercialization, the direct involvement of the state government is still visible through the present law governing the port of Klaipeda which enables the port of Klaipeda receive state budget allotments (Bolevics, et al., 2013). Moreover, the change of the political power in the government might have also a role to play in setting the agenda for port development planning.

The most important priorities of port of Klaipeda authority are to ensure:

“the smooth functioning of Klaipeda port, increase its competitiveness, efficient use and development of the port infrastructure, building business friendly environment for the maritime sector growth, implementing up-to-date technology, human resource improvement, international quality standards and compliance with the transparency requirements” (Port of Klaipeda, 2015b).

The concise overview of the port of Stockholm and the port of Klaipeda profile concerning the ownership, governance model, strategic development objectives, port terminals and annual turnover signifies the existing differences between the ports which have to be taken into consideration when analysing supranational and national port development strategies and when approaching the interview data.

## IV. TRACING *INNOVATION* IN POLICY DOCUMENTS

### 4.1 Ports in EU policy: from “functional terminals” to “engines for growth”

Since economists identified the link between innovation and economic growth, decision makers have started taking steps to prompt technological developments and innovations (Goffin and Mitchell, 2010). The concept of innovation became a meta-level framework for adopting new legislations and regulations in the European Union, regional and national level: “... political processes are valued by their contributions to innovative capacities and their commitment to a grand narrative of the “innovative society”” (Ahlqvist, 2014, p. 1712). As a result, the term innovation became gradually integrated in various policy documents.

The grand innovation narrative has also been incorporated into EU port policy documents. It is important to stress that appearance of innovation concept in EU port policy documents is not a new phenomenon. The innovation narrative could be found already in the Green paper on seaports (COM(97) 678 final) adopted in the 1990s which, according to Verhoeven (2009), was the first EU genuine publication on ports. However, in the first EU policies for port development the term innovation was seen through the technological development prism and less through ports’ management or organisational activities. I argue that application of the concept of innovation in a broader manner in EU port policy documents was connected with the shift in the EU attitude towards the ports.

In order to trace a shift in the EU attitude towards the ports it is crucial to understand a general development of the EU port policy and to elaborate upon the most relevant EU port policy documents. Also, it is important to note that only the core EU port policy documents which manifest outstanding shift in the EU attitude towards ports will be presented in further discussion in this section.

From the historical point of view, European Commission’s ambitions to create a common EU port policy were marked with a complexity of often conflicting factors. The diversity of EU seaport system with its distinct governance models, on the one hand, and the complexity of EU seaport environment where the interests of various stakeholder groups are involved, on the other hand, effected the EU port policy development.

Since signing of the Treaty of Rome in 1957 up to 2007 no coherent EU port policy framework existed. During the first years of European integration a prevailing view was that port sector does not need any supranational policies (Pallis and Verhoeven, 2009). European ports were included in the common transport policy framework only in the middle of the 1980s. The attention towards development of a European port policy increased in the early 1990s (Chlomoudis and Pallis, 2002). This was particularly visible through the amount of adopted action plans and documents which aimed to improve a competitiveness and efficiency of European ports taking into consideration economic, technological, organisational and environmental issues (ibid, 2002).

Thus, such factors as economic globalisation, containerization, technological advancements, expansion of transshipment, logistics, and the integration of maritime trade in supply chains increasingly influenced policy makers and port actors to start a serious discussion on the common European port policy (Pallis and Verhoeven, 2009).

In 1997 the EC published the first genuine publication on ports called “The Green Paper on Seaports and Maritime Infrastructure” (COM(97) 678 final). The EC recognised a fact that port sector have not been at the centre of European transport policy debate. As a result, the EC aimed to encourage a discussion among the EU member states, port authorities and other stakeholder groups on the port organisation, infrastructure, safety, and the environmental matters. According to Verhoeven (2009, p. 85), the Green paper “took a rather outspoken liberal view on ports, considering them as terminals having mainly commercial activities with greater involvement of the private sector”.

The Green paper identified ports as transfer places with commercial activities in the intermodal transport chain system which should foster custom-oriented services, favour innovations and contribute to the regional and national growth. One can find two very interesting details within EU attitude towards the ports which were inexplicitly recorded in the Green paper. First of all, some remnants of the traditional attitude towards the ports, which dominated until the 1970s, could be found in this discussion paper. According to Robinson (2002), until the 1970s the ports were considered merely as places where the ships and cargo was handled. In the Green paper the ports were also treated as transfer places or simply as local terminals. In addition, a reference to ports “as centres of regional and national development” corresponds with the traditional attitude towards the ports which dominated back in the 1960s. The ports were

considered to be “the structural nodes in the transport network, but were inserted within transcending questions of regional and national development” (Olivier and Slack, 2006, p. 1413). Also, due to the change in the ports market environment, the EU emphasized that ports are becoming active commercial players in the transport chain. According to Slack (1993, p. 580), in the 1990s ports were already becoming “pawns in a game of commerce that is global in scale, and on board where the major players are private corporations whose interests rarely coincide with the local concerns of the port administrations”.

One can notice that still very traditional attitude towards the ports prevailed in the Green paper on Sea Ports. Ports were regarded as local places where ships and cargo was handled. Simultaneously, a node of a new pattern in EU attitude towards the ports can be depicted. Ports’ commercial activities, interconnectedness with the other transport modes and a need to foster innovations have been recognised. However, a notion of innovation within the document was not specified thoroughly.

Ports’ operational environment since the late 20th century was increasingly challenged by post-Fordist market environment characterized by global corporations, outsourcing, deregulation and technological innovations (Notteboom and Winkelmanns, 2001). Particular emphasis in the post-Fordist era was given to a role of innovations; innovations were regarded as the prime objective for global competition and for the quality issues – both in terms of safety and environment (Selkou and Roe, 2004). Robinson (2002, p. 245) argues that in the 2000s ports went through extremely important paradigmatic changes: “It is clear that the ports are now operating in a new environment – which is globalized, corporatized, and privatized and is exceptionally competitive; it is also a logistics-restructured environment”. Ports were no longer treated merely as places with complex functions. Instead, ports became elements in value-driven chain system. As a result, altered ports’ role had to be reflected in EU port policy documents.

A shift in EU attitude towards the ports can be traced from EC Communication on European port policy adopted in 2007 which finalised two previous unsuccessful attempts to pass the legislative proposal on European seaports service improvements. In the Communication on European port policy ports were described as “key points of modal transfer and key economic clusters, strategic gateways of goods, focal centres of

tourism for cities and whole regions” (COM (2007) 616 final). The ports were no longer treated simply as transfer places. Their importance for national and regional development and economic growth was recognized. The new vocabulary introduced in the European port policy document such as “key economic clusters” opened a new window for further discussion considering ports’ role in a new operational business environment where the process not only of vertical but also of horizontal networking activities had to be taken into consideration.

Moreover, the common European port policy emphasized the role of technological innovations for European ports: “New technological innovation related to port equipment ... will also have an important role to play in making Europe’s ports more efficient” (COM(2007) 616 final). The term innovation was associated with general technological advancements.

Thus, changes in ports’ market environment required to introduce a new approach to ports. The introduction of the term “key economic clusters” in the port policy documents embodied a shift in the EU attitude towards ports. The role of ports was extended. Now, ports had to become assemblages of economic activities and elements in a value-driven economic chain system. In other words, their “static” role of simply being the functional terminals or transfer places had to be replaced by more “proactive” role. The new ports’ role in the 2000s meant the increased importance of relationship development with other transports modes, creation of strategic partnerships with other ports and facilitation of networking activities with port stakeholders, to name but a few.

Nevertheless, a large-scale change in the EU attitude towards the ports occurred in the 2010s when a new port strategy “Ports – an engine for growth” was published (COM(2013) 295 final). The EC recognized that ports are “important critical infrastructures, as key service providers to the entire economy” and “main gateways to the trans-European network” (COM(2013) 295 final). According to the document, ports had to take their role as enablers for growth and multimodality. Moreover, the EC proposed to develop EU port competitiveness by connecting ports, developing efficiency, attracting investment, promoting social dialogue and encouraging sustainability and innovation. Differently than in the previous port policy documents, the EC put emphasis on innovations. The EC recognized that ports were dependent not only on technological innovations, but also on their ability to innovate in terms of

organisation and management: “The competitiveness of European ports will depend on their ability to innovate in terms of technology, organisation and management. Their critical roles as multi-modal hubs require innovative and efficient ways of cross-modal connections and use of management tools in order to further increase their attractiveness” (COM(2013) 295 final, p. 12).

In the new EU port strategy adopted in 2013 ports were considered as catalysts of economic growth. Ports evolved from simply being a “dot on a map” to complex places. Innovations in this complex port operational environment were named as one of the key factors which contribute to port’s competitive advantage and economic growth.

To sum up, I argue that the EU attitude towards the ports was constantly evolving (see Figure 4). If in the 1990s the ports were treated merely as functional terminals or transfer places, in the 2000s the role of the ports, according to the EU policy documents, expanded. Ports became “key economic clusters and strategic gateways”. Finally, in the EC communication released in 2013 ports were perceived as “engines for growth” with a new emphasis on organisational and management innovations. The EU attitude towards the ports being “engine for growth” within which the broader understanding of innovation concept was introduced becomes the focal point for further research.

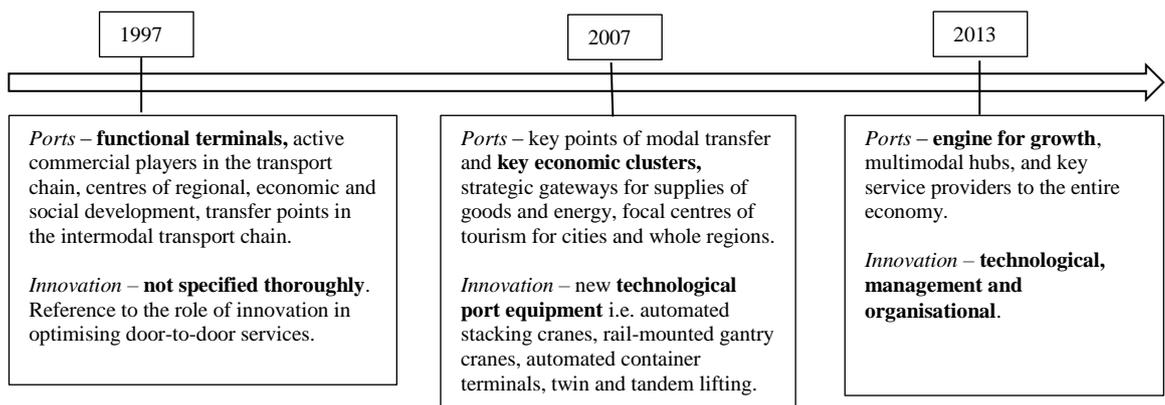


Figure 4. Changing notions of “ports” and “innovation” in EU port policies and strategies (author’s compilation)

#### 4.2 The ports of Klaipeda and Stockholm in the Baltic Sea Region policy framework

The ports of Klaipeda and Stockholm are part of the Baltic Sea Region which is regarded as one of the most prosperous regions in Europe considering “very well-educated workforce, expertise in innovation, a spacious and relatively unspoilt land environment rich in natural resources and a strong tradition of intra-regional cooperation” (COM(2009) 248 final). The port of Stockholm emphasizes its dependence to the Baltic Sea Region in its Annual Report 2013: “Our vision is to be recognized as the number one port in the Baltic Sea – a welcoming and commercially advantageous partner” (Ports of Stockholm Annual Report, 2013, p. 3). Meanwhile, the port of Klaipeda stresses its strategic position as being the northernmost ice-free port in the eastern part of the Baltic Sea Region and strives to become the leading port on the eastern shore of the Baltic Sea.

EU environmental, maritime and transport policies affecting the development of ports were put on a macro-regional level in the late 2000s. Following a communication from the EC, strategy for the Baltic Sea Region (EUSBSR) was signed in 2009. The main idea behind the macro regional strategy was to ensure the reinforcement and integration of the existing EU policies on regional level. Even though the port sector was not explicitly mentioned in the EUSBSR Action plan, the priority areas dedicated to maritime safety and security, innovation in maritime sector encouragement, promotion of clean shipping, improvement of the internal and the external transport links and the tourism promotion in the region directly corresponds to the ports operational environment (SEC(2009)712/2).

Thus, the strategy for the Baltic Sea Region is an innovative policy tool which can contribute in achieving EU policy goals and the one that can help to enhance networking and cooperation activities among various actors. In addition, EUSBSR can assist in finding the solutions for common sectorial challenges. For example, according to Dubois, et al. (2009), the macro-regional approach can enable to tackle environmental challenges which are beyond a country borders.

One of the recently enforced environmental regulations introduced by the International Maritime Organisation (IMO) and the EU put the pressure on the Baltic Sea Region’s shipping companies and ports. The EU environmental legislation’s, which came into

force on 1 January 2015, aim was to reduce marine sulphur emissions from shipping operations in the Sulphur Emission Control Area (SECA) comprising of the Baltic Sea, the North Sea and English Channel by 0.1 percent. Meanwhile, the sea areas outside the SECA region were left with the legislation of 0.5 percent sulphur emissions until 2020 (Directive 2012/12/EU). Stricter environmental regulations in Baltic Sea Region brought challenges not only to marine transport but also to the Baltic Sea Region ports which needed to adapt their infrastructure in order to be able to provide services for the ships which have chosen to install the scrubbers or run their engines on liquid natural gas.

One of the examples of the macro-regional approach used in order to tackle the environmental challenges on clean shipping was launched in the EUSBSR project called CLEANSHIP. The port of Klaipeda and the port of Stockholm were the participants of the project and were mentioned in the project report as the exemplary ports that introduced innovative solutions and established required infrastructures in the port area that contribute to the clean shipping concept.

In addition, the EUSBSR also aims to coordinate EU maritime and transport policy through the Trans-European Transport Network (TEN-T) (Dubois, et al., 2009, p. 23). It is important to emphasize that since signing the Maastricht Treaty in 1992, which laid down the rules for the establishment of TEN-T, until the beginning of 2000 ports were not included in the TEN-T. Only on 5 June 2000, the European Council agreed to incorporate the port sector in the TEN-T framework (Chlomoudis and Pallis, 2002). It was widely agreed upon the importance of ports for the overall sustainable transport development in Europe.

Since the early 2010s the port of Stockholm and the port of Klaipeda is part of the TEN-T core transport corridor network (EU regulation No 1315/2013). The port of Stockholm was nominated being part of the Scandinavian-Mediterranean corridor and the port of Klaipeda being part of the North Sea – Baltic corridor. Inclusion to the core transport corridor network provided the ports with the possibility of receiving EU funding for port's development projects. The port of Stockholm and the port of Klaipeda were part of numerous projects which received co-financing from the TEN-T programme budget. The on-going project in the port of Stockholm which aims to rebuild inner Värtahamnen and Frihamnen port facilities could be named, among the

others, as one of the projects partly co-financed by the TEN-T programme. Moreover, the port of Stockholm and several Finnish TEN-T core ports applied for a common project in order to improve port's infrastructure and environmental services in the EU TEN-T policy framework in 2015 (Port of Stockholm, 2015c). Meanwhile, the port of Klaipeda used TEN-T budget allocations for preparing the environmental impact assessment for Klaipeda outer deep-water port and other infrastructural developments such as the reconstruction of the most important roads connecting the port of Klaipeda with TEN-T corridor.

To sum up, ports' dependence to the Baltic Sea Region creates not only many challenges, i.e. stricter environmental regulations, but also provides considerable opportunities for cooperation among the ports. EUSBSR priority areas in connection with maritime security, clean shipping, and innovation encouragement in maritime sector serves as a medium encouraging the port actors to cooperate. Following Giddens's structure-agency framework, the macro-regional strategy can be regarded as structure which enables the port agency, that is, the port actors to cooperate. However, the willingness of the port actors to condition the use of it depends on the knowledgeability of the port agency. The example of CLEANSHIP project, developed as part of the EUSBSR, is one example illustrating how the actors of the ports of Klaipeda and Stockholm exercise the use of the structural properties of the EUSBSR. However, there are many other cooperation examples among the ports of the Baltic Sea Region which follow the rhetoric of the EUSBSR policy framework. For instance, the port of Stockholm and the port of Turku launched a new cooperation initiative in 2011 concerning liquefied natural gas (LNG) bunkering solutions, ship-shore power supply facilities and management of grey and black water issues (Port of Stockholm, 2011). Some of the subjects included into cooperation agenda such as LNG and ship-shore power supply are examples of environmentally-driven process innovations in the port sector. Hence, the structural properties of the regional policy framework can enable the port agency to increase know-how and implement innovation-driven initiatives in the port sector.

#### 4.3 Innovation in Lithuanian port policies: recognised but unspecified concept

The interdependence among port policies on supranational and national level becomes important for enhancing dynamics of the EU ports development. Simultaneously, port policy development and implementation possibilities are shaped by cultural, economic and political peculiarities within each country. Yet, despite existing policies on supranational level each country, or the port authority alone, has a right to prioritize the key port's development issues:

“Seaports are intrinsically important tools for increasing social welfare. At least, this is the implicit assumption on which government bases policy <...> Government can, through its policies, help determine the extent to which ports are able to take advantage of economic developments and how great their social yield is” (Strubbe, 2001, p. iii).

The Lithuanian port development planning is integrated in the common transport development documents adopted by the Ministry of Transport and Communications. In the strategic action plan for infrastructure development 2011-2013 the important emphasis was given to modernisation of current transport system, improving its competitiveness and encouraging innovations, to name but a few (Susisiekimo ministerijos 2011-2013 metų strateginis veiklos planas, 2011). The analysis of the action plan revealed what meanings such general terms as “modernisation, competitiveness and innovations” possess and how they signify further development planning of the Klaipeda seaport.

According to the action plan 2011-2013, the Klaipeda seaport competitiveness and modernisation need to be enhanced by constructing a modern passenger and cargo terminal, by improving the road and rail connections with the port's terminals, by increasing the safety standards for navigation activities in the port area, by widening and deepening the ports' navigation canal, by promoting activities of the companies creating the added value to the port's performance, by developing common port of Klaipeda and city of Klaipeda infrastructure, and by implementing pollution prevention from shipping operations.

In the analysis I performed on the strategic action plan for infrastructure development 2011-2013 I discovered that the notion of innovation remains unspecified. In other

words, it is unclear to what type of innovations the action plan refers and how they are supposed to contribute to the port's development. However, one can argue that innovations could be expected to appear at any implementation stage of the listed port development objectives. Also, it could be stated that project them is beyond the scope of the action plan documents. However, an explanation to what type of innovations the action plan document refers and how the port authority could contribute in promoting innovation-driven initiatives in the port sector could serve as a guide for the port authority when implementing the action plan's objectives.

I argue that the term innovation should not only be interpreted in terms of something created by scientists or in terms of high technological advancements. The organising and management innovation activities, as recognized by the EC strategy "Ports – engine for growth", also corresponds to smart policy making and innovative policy decisions which, if enforced effectively, could lead to increased port's competitive advantage.

The latest national strategy for transport development was ratified in 2013. The new programme was prepared in accordance to Lithuanian progress strategy "Lithuania 2030" which promotes smart society, smart economy, smart governance and emphasizes the role of innovation (State Progress Council of Lithuania, 2012, p. 8). The National Programme for the Development of Transport and Communications for 2014-2022 aims to develop a competitive, modern and sustainable transport in Lithuania (Lietuvos Respublikos Vyriausybė, 2013a). The programme foresees the need to modernise present and create a new infrastructure in the port of Klaipeda which would ensure the safety within the port area and would improve the reception facilities of the larger ships. Also, considering increased environmental regulations, the programme suggests installing a new infrastructure meeting new environmental requirements in the port of Klaipeda area (ibid, pp. 4-5). In addition, the following targets are set in the document for further development of the Klaipeda seaport: to reconstruct piers and quays, to deepen and widen the navigation canal, further develop plans to construct the outer deep-water port in Klaipeda, to mention but a few.

Even though the transport development programme does not explicitly refers to innovations, other measures such as modernise transport sector, increase competitiveness, encourage interdisciplinary dialogue among public and private actors and enhance cooperation with the other Baltic Sea Region countries are listed in the

document as important factors contributing to the effective development of the transport in Lithuania.

Differently from the long-term strategy, the strategic action plans for the infrastructure development 2012-2014 and 2015-2017 explicitly refer that Lithuanian transport sector's competitiveness depends on the abilities to use the latest technologies and develop innovation orientated services (Susisiekimo ministerijos 2012-2014 metų strateginis veiklos planas, Susisiekimo ministerijos 2015-2017 metų strateginis veiklos planas). Thus, innovations are seen as an important factor contributing to transport sector's competitiveness.

Furthermore, the strategic action plan for infrastructure development 2015-2017 refers to the transport sector as being the cornerstone for Lithuania's economy. According to the document, the modernisation of the sea transport can contribute to economic growth in Lithuania. Also, the cooperation activities between the port of Klaipeda authority and the Ministry of Transport and Communications can assist in obtaining "maximum port's competitiveness, effectiveness and safety" (Susisiekimo ministerijos 2015-2017 metų strateginis veiklos planas, 2014, p. 52). According to the strategic action plan, the port of Klaipeda development programme was drawn considering the following strategic objective: "To create modern, balanced, safe and environmentally friendly transport system – the intermodal regional centre – which would effectively serve the interests of people and business". (Susisiekimo ministerijos 2015-2017 metų strateginis veiklos planas, 2014, p. 52, author's translation).

Apart from the latest Lithuanian programmes and strategies dedicated for transport development, other national programmes such as Lithuania's Innovation Development programme for 2014-2020 foresees a need to encourage innovations not only in high technology intensive sectors, but also in public sectors. According to the programme, public sector and the society at large should be involved in the process of innovation considering management and organisational innovations (Lietuvos Respublikos Vyriausybė, 2013b).

In addition, the analysis which I performed on Lithuania's Innovation Development programme for 2014-2020 also revealed that the decision makers encourage innovations in those national and private sectors which are creating added value to the whole country's economy in particular (Lietuvos Respublikos Vyriausybė, 2010). The

transport sector was mentioned in the programme as having a high potential to increase its potential with the support of innovations.

To sum up, one can realize that innovation discourse within Lithuanian infrastructure planning documents has been growing gradually since 2011. Moreover, the need for innovations has been recognized not only in transport sector in general, but also the attention has been drawn towards the importance of innovations for the port of Klaipeda competitiveness. Yet, the communication of what type of innovations and how they could enhance the port of Klaipeda competitiveness is not present in the strategic port development documents.

#### 4.4 Innovation in Swedish transport policies: supporting green solutions and sustainability goals

Differently from the state-owned port of Klaipeda and its development strategies which are incorporated in the national planning documents for transport development, Swedish national authorities have no decisive influence upon the port of Stockholm development planning. The port of Stockholm is the municipality-owned company which bases its development planning on business strategy (Ports of Stockholm Annual Report 2013). Nevertheless, whatever the case of the port ownership is, all ports are considered as undertakings regarding EU law and regulations (Verhoeven, 2009). Moreover, ports are also dependent on the considerable amount of regulations and supervision either by state or by local authorities. For example, in the case of the port of Stockholm, the regulatory authorities are Swedish Maritime Administration (SMA), Swedish Transport Agency, Swedish Environmental Protection Agency and County Administrative board (Ports of Stockholm Annual Report 2013). In addition, the city municipality also takes an active role in the port's development planning and supervision.

Considering a fact that ports are key infrastructure providers for shipping activities, certain international or national regulations for shipping and the ports' integration in overall transport system in general, might have either direct or indirect impact for ports' performance. For example, the Swedish governmental company Swedish Maritime Administration is responsible for maintaining the fairways outside the port area. That means that the port capabilities to provide infrastructure facilities for larger vessels also

depend on governmental budget allocations for maintaining the fairways. Also, the state's role and national transport development planning in connection with port's integration in the national transport system is one of the important factors contributing to port's attractiveness and competitiveness.

Thus, the state's responsibility for infrastructure development in connection with port is confined by developing road, rail and shipping infrastructure outside a private or municipality owned port area. Even though the Swedish government does not have decisive influence upon infrastructural developments within an actual port area, an overview of the key national transport policies is critical in understanding the port's role in the overall Swedish transport system. Moreover, the analysis of national transport policies assists revealing the role of innovation in the context of transport sector.

Apart from the Ministry of enterprise, energy and communications, there are two governmental organisations which take responsibility for the waterborne transport development planning within the country. The Swedish Transport Administration (*Trafikverket*) is a governmental agency responsible for long-term transport planning, including all modes of transport. Another important organisation within a public sector is SMA responsible for providing infrastructural services for shipping activities such as fairway maintenance, piloting, navigation information, hydrographics, search and rescue (Sjöfartsverket, 2014). SMA aims to develop transport and maritime policy in line with the parliament and government decisions. Moreover, SMA is taking an active part in promotion of innovation-driven activities within maritime sector.

In 2008 the Swedish government issued proposal "Framtidens resor och transporter – infrastruktur för hållbar tillväxt" (en. Future traveling and transportation: infrastructure for a sustainable growth). According to the document, the strategic ports and central terminals will have to be taken into consideration when planning and developing the transport system within the country (Regerigens proposition, 2008/09:35). Moreover, the document emphasized that the ports are the important strategic nodes in the overall transport chain system.

In the national plan for transport system 2010-2021, issued by the Swedish Transport Administration, long-term steps for infrastructure development were listed. Considering

that more than 90 percent of foreign trade pass through Swedish harbours, ports, likewise in the previous documents, were defined as being key nodes in the overall Swedish transport system having great importance for the country's foreign trade (Trafikverket, 2011:067). According to the document, increased size of vessels and environmental regulations placed a greater demand for fairway maintenance and existing infrastructure in the harbours.

Apart from Swedish national transport planning documents which take into consideration the location of the strategic harbours, their importance for the overall transport chain system and the forthcoming challenges, other governmental documents that emphasize the role of innovation should be considered. Increased Swedish government's attention towards innovation in transport sector was reflected in series of documents (Regeringsbeslut, N2012/1991/TE; Regeringsbeslut, N2013/121/TE; Regeringens beslut, N2014/1057/TE). For example, the need for innovations in transport sector was justified by referring to the existing innovation strategy documents in the EU, i.e. Europe 2020 strategy (Regeringsbeslut, N2012/1991/TE). The notion of innovation was described as being "the most important driving force for growth, welfare and the environment" (ibid, 2). According to the document, all sectors, including transport, should work in order to create the best possible conditions for innovations within a country. Other governmental directives (Regeringsbeslut, N2013/121/TE; Regeringens beslut, N2014/1057/TE) placed transport organisations such as Swedish Transport Administration and SMA under the obligation to report about the research and innovation activities which could contribute to the renewal of the transport system. In addition, the documents obligated to report about already existing innovation practices within the transport sector.

The governmental bill for the investment in strong and sustainable transport system for the period 2014-2025 also gives a reference to the importance of innovations for the development of a sustainable transport system (Regeringens proposition, 2012/13:25). Especially the need of innovations in tackling environmental challenges in connection with shipping activities was indicated in the document.

In 2014 Swedish Transport Administration issued report for long-term transport planning which could be used as a discussion platform by the government when

implementing future transport planning. Swedish Transport Administration identified the key future societal and transport trends which should be taken into consideration when drafting the transport planning. Increased amount of population, the impact of digitalisation and changed focus in economic geography were identified, among other factors, as the key mega societal changes. In addition, the greater pressure on transportation, integration and connectedness, new patterns of urban planning were distinguished as being the most important challenges to the transport system (Trafikverket, 2014). How do these changes might affect the ports?

The rising population and urbanisation trends in the port cities might increase the pressure to the transport system, ports being part of it. The ports will have effectively integrate in the transport corridors and increase their capacities and efficiency due to the increased demand on the shipping activities. Moreover, changes in urban planning trends in cities and increased environmental regulations require innovative decisions to be applied in the port areas in connection with the pollution prevention and the creation of dynamic relationships between port and its urban districts.

In the Operational Plan for the Ports 2014 prepared by the Swedish transport group, which is the umbrella organisation for the companies and associations in the transport sector in Sweden, the ports were described as service providers within transport and logistics industries. In the short-term strategy for port development a need for innovative solutions in order to tackle environmental challenges were emphasized: “The ports have to maintain the leading position in tackling the environmental challenges” (Verksamhetsplan för Sveriges Hamnar 2014, p. 5).

Recognising a presence of innovation discourse at national level documents in connection with transport development, yet realizing that the national authority does not have any direct influence on the port of Stockholm development planning, it is of utmost importance to consider whether the notion of innovation is anyhow incorporated in the port of Stockholm strategies and reports. In the ports of Stockholm annual report 2013, the term innovation was mentioned several times when referring to ports’ “innovative employees”, “innovative green solutions”, and innovative solutions in general that provide preconditions for the port customers to operate sustainably (Ports of Stockholm Annual Report 2013). In the most recent ports of Stockholm annual report

(2014), the notion of innovation was inserted in the port's stakeholder discourse. The emphasis was given to the idea that sustainable innovative solutions in port sector can be achieved by developing close cooperation with ports' stakeholders (employees, shareholders, customers, local residents, other organisations, Swedish government and European Union) (Ports of Stockholm Annual Report 2014).

To sum up, in the analysis I performed on the latest Swedish transport planning documents and the port of Stockholm annual reports I observed an increased innovation discourse at both policy and strategy level. The need for innovations in order to tackle environmental challenges was recognised at the national level policies and strategies for transport development. Likewise, the necessity of innovation-driven environmental solutions was identified in the documents covering the Swedish ports issues. Meanwhile, the port of Stockholm also refers to innovations when referring to "green" solutions, stakeholder cooperation and sustainability issues.

## V. SEAPORT INNOVATIONS: THE PORTS OF KLAIPEDA AND STOCKHOLM

### 5.1 Linking concepts of port governance and innovations

Considering the existing governance structures in the complex port functioning environment, one must make a distinction between the port authority governance and the port governance. According to de Langen (2007), the former notion presupposes the traditional corporate governance model consisting of landlord, regulator and operator functions, whereas the latter, due to many actors involved in the port operations, is closely linked to the notion of cluster governance.

Increased rhetoric of neoliberal economic thinking influenced the port actors to reassess their governance options (Ng, et al., 2014). The port governance became a “trendy lens by which to approach the port not as a space but as a community” (Olivier and Slack, 2006, p. 1409). The port community consisting of variety of actors such as transport firms and operators, governmental and non-governmental port related organisations, port-related manufacturing industries, supranational and national environmental organisations, etc., forms a complex economic fabric which, if managed successfully, might deliver economic and societal benefits to the entire port community, city and its region.

Considering the variety of actors in port sector one might question who is responsible for port cluster’s management activities. Several researchers (Parola, et al., 2013; de Langen, 2007; Verhoeven, 2010) identified that management activities of port cluster or, in other words, port community management function, can be undertaken by a port authority. According to Haugstetter and Cahoon (2010), collaborative activities with various port stakeholders that capture and integrate knowledge and learning creates new possibilities for port authorities to innovate.

I argue that networking activities within a port cluster and other collaborative activities with ports in proximity might lead to increased know-how and contribute to innovative solutions when responding to increased environmental regulations or solving seaport and port-city cooperation challenges. The cooperation activities between the port of Stockholm and the port of Turku, to which I referred when discussing the regional policy framework in section 4, is well suited example in the context of innovation-

driven port's governance practices. Following Giddens's structure-agency framework, regional policies (i.e. EUSBSR) could be regarded as the structure that stimulates agency to produce practices. In the context of port's governance practices, the structure can both enable and constrain port actors from cooperation practices. Yet, in the case of the port of Stockholm and the port of Turku, existing structural properties enabled the port agency to cooperate and produce innovation-driven practices. In other words, port authorities increased their know-how and adopted innovation-driven solutions in both of the ports (i.e. LNG bunkering, ship-shore power supply).

Furthermore, by adopting the role of mediator in managing complex port cluster, the port authority can also become an incentive to innovate provider for the other port actors. As noted in the EU port strategy "Ports: an engine for growth", port actors are encouraged to apply innovative technology, management or organisational initiatives in order to increase port's competitive advantage. However, according to Haugstetter and Cahoon (2010, p. 35), a port authority has considerable limitations to provide innovative incentives: "A 'smart' port authority can be thought of as teetering on the brink of chaos; finding the path between providing incentives to innovate and share the benefits amongst the key cluster participants and simultaneously manage its private/public partnership is difficult".

Thus, considering a role of a port authority in port cluster management, that deliver not only economic and social benefits but also pose many challenges, one should not underestimate a role of other port's actors in deploying innovative initiatives in the port sector. According to Gritsenko (2014) one way of analysing the governance is to take into consideration the multiplicity of actors and their position towards the studied phenomenon. Hall and Jacobs (2010) also agreed that to understand what innovation means to port's actors is of utmost importance. Thus, in the following section I explore the port of Stockholm and the port of Klaipeda authorities' and other port actors' attitudes towards innovation per se and their perceptions upon the relevance of innovations for port's competitiveness.

#### 5.1.1 Ports actors' approach to seaport innovations

The analysis of the port policies and port development planning documents revealed the increased importance of innovations for the port sector. The application of new ideas,

organisational and management models together with advanced technological solutions is considered to be one of the key factors contributing to ports' competitiveness and attractiveness. Moreover, a new idea of port governance, that is, port cluster management model can be regarded as a tool that stimulates cooperation activities among port agency and the one that can become a catalyst of innovation in port sector per se.

Simultaneously, the process of innovation adoption in port sector is complex since it requires not only organisational change but also the wide support of actors involved in the process (Arduino, et al., 2013). I argue that key aspects influencing the deployment of innovation-driven initiatives in the port sector is the local context and the prevailing understanding among the ports actors of the concept of innovations in general. Following Giddens's formulation (1979), the agency's knowledgeability together with the structural properties is crucial for the constitution of social practices.

The analysis of the collected interviews with the ports of Stockholm and Klaipeda authorities and other port actors revealed the existence of a diverse understanding towards the notion of innovation and its practical relevance to port's competitiveness. According to port of Klaipeda authority, the notion of innovation can refer to innovative products or processes (i.e. freight and goods information system introduced in the port of Klaipeda): "innovation is a product which allows achieving better results and allows to distinguish oneself from the others" (Interview no. 7). The main innovations, as noted by the respondent, can be found in the port of Klaipeda terminals' technologies and their management activities (Interview no. 3). According to the interviewee, the most important goal of the port of Klaipeda is to create as much added value as possible. Therefore, the port of Klaipeda authority is not concerned by which means, developing innovative activities or not, companies operating in the port, will create the added value (Interview no. 7). In addition, innovation per se is not being considered as the most important factor contributing to the port's competitiveness (Interview no. 7). Hence, one can make a conclusion that the port of Klaipeda authority does not take on a chief motivator's role in encouraging the port actors to adopt innovative solutions.

According to another respondent, that is, the Central Klaipeda terminal authority, a difference when analysing innovation-driven practices in the port sector should be defined between practices new to the particular port and practices novel to the port

sector in general (Interview no. 4). For example, the construction of Central Klaipeda terminal, according to the interviewee, can be considered as innovation in the context of the port of Klaipeda (Interview no. 4). Until 2014 the port of Klaipeda did not have a passenger terminal capable of providing necessary services for ro-pax ferry passengers. Thus, the construction of the terminal with all relevant infrastructure including services for passengers, long and short time parking places, and connections with public transport was an innovation in the context of Klaipeda seaport. On the other hand, according to Central Klaipeda terminal authority, analogous passenger terminals in other ports would not be considered as innovation but as elementary infrastructure (Interview no. 4).

Another interviewee, representing the company operating in the port of Klaipeda – shipping line DFDS Seaway, defines the term innovation as “a change in the course of action, which leads to companies’ increased competitive advantage against its competitors” (Interview no. 6). According to Lithuanian maritime researcher’s views, innovation in the port sector involves the qualitative change considering technological and organisational arrangements (Interview no. 5). For example, according to the interviewee, the port of Klaipeda with the support of marine simulators and without making any changes in the port’s infrastructure increased the reception of the larger ships facilities. Currently, the port of Klaipeda is able to accommodate vessels which length exceeds 300 m. Thus, innovative organisational arrangements become crucial in responding to the increased vessel parameters and for qualitative port’s development. The example of innovation-driven initiative implemented in the port of Klaipeda also indicates how the port agency’s knowledgeability contributes in adopting novel solutions, that is, the use of marine simulators.

The port of Stockholm position towards innovations in the port somewhat corresponds to the port of Klaipeda authority views. The port of Stockholm authority’s goal is not to focus on innovations per se. According to the port of Stockholm authority, the primary target for port’s development is the customer’s demand (Interview no. 1). However, the innovation-driven initiatives, according to the interviewee, can be found in daily port operations: “since we always try to make things better or different” (Interview no. 1).

Even though the port of Stockholm authority would not place innovation on the top of their priority list, the port’s position per se and the constant attempt correspond to the

customer's demand becomes a driving force in development of new ideas. One example of the organisational innovative solutions implemented in the port of Stockholm, according to the interviewee, was a prolongation in using the cruise terminal. Due to a limited cruise shipping activities, which last approximately from the late April till the beginning of October, the cruise terminal was not being used for half a year. Thus, the port of Stockholm authority made an agreement with one of the largest event organisers. As a result, the cruise terminal was accommodated with the events during the winter time. According to the port of Stockholm authority, innovative organisational arrangement created an additional financial value to the port of Stockholm.

According to the city of Stockholm sustainability strategist, directly involved in the ongoing Stockholm Royal Seaport project development, the concept of innovation can be understood in a very broad manner:

“We try to have a quite broad view on innovation. It could be technical innovation and that is what people think for the most. But we think that innovation is also about the way of organising things and cooperation. It is also in a way what kind of business models one is using and what kind of services one is developing” (Interview no. 2).

However, according to the interviewee, taking into consideration the actual innovations in the port sector one might consider technological innovations i.e. new cranes, a way the port authority cooperates with the city planning department or the way the port cooperates with the transport and shipping companies (Interview no. 2).

Very similar understanding of the concept of innovation was drawn by the maritime researcher representing the Swedish Maritime Administration. According to the researcher, the concept of innovation could be defined as a new product, a new process or a new way of thinking (Interview no. 8). E-navigational services for shipping lines which increase the efficiency in information exchange among the vessels, road and rail could be seen as an innovation in the port sector (Interview no. 8). However, as responded noticed, it is important to realise that cooperation activities among government, industry and academia is the key for successful innovation deployment (Interview no. 8).

To conclude, the port agency's approach to the concept of innovation becomes an important channel through which the ports actors' knowledge and understanding about innovations is translated into practice. Following Giddens's (1979) thinking concerning the relationship between structure and agency, I argue that the transformation of the notion of innovation at port policy level provoked the emergence of a new structure to which the port agency is challenged to respond. Yet, the analysis I performed on examining the ports actors' approach to innovations, revealed that the notion of innovation is not in all cases perceived as the EU strategy "Ports: an engine for growth" imply. In other words, port agency's understanding does not perpetually correspond with the rhetoric of innovation inscribed in "Ports: an engine for growth".

In some cases the concept of innovation is identified merely with product or service advancements, whereas a possibility to innovate in terms of management and organisation is not being considered yet. Moreover, not all port actors are willing to take the role of "innovators". In the case of the state-owned port of Klaipeda, innovation-driven technological, organisational and management initiatives are most likely to be found within the private companies operating in the port area such as terminal operators or shipping line companies. In addition, innovation per se is not in the top priority list neither in the port of Klaipeda nor in the port of Stockholm. However, considering the private municipality-owned port of Stockholm, the customer's demand and the business based approach becomes the catalyst in deploying innovation-driven solutions in terms of organisation and environmental management.

## 5.2 Environmental innovations in the ports

### 5.2.1 Defining environmental innovations

Until the 1990s transport infrastructure planning and development was not largely affected by environmental concerns (Rodrigue, et al., 2009). However, during the last two decades the situation has changed immensely: "The future of the transport industry is likely to be compromised without understanding of environmental sustainability" (ibid, p. 261). The goal to reduce negative environmental externalities and aspiration to develop sustainable transport increasingly became central in various policies and transport development strategies. The ports and their operational environment have been

also affected by the increased concerns over the marine environment, pollution, air, water quality and noise emanating from port operations issues which were embodied in various regulations and policies.

As noted in the EC Communication “Ports: an engine for growth” the EC “encourages the port sector to promote excellence in environmental management and performance” and continuously support voluntary introduced environmental schemes such as the Green Award certificate or differentiated port dues which raise the environmental image of the ports (COM(2013) 295 final). In addition, the idea of addressing environmental challenges by developing and applying innovative management tools was raised by the EC.

Apart from EC Communications and strategies which are not aiming to enforce but rather to encourage the port sector further increase their environmental image and to develop innovative management tools, environmental regulations can actually contribute to introduction of innovative solutions in the port sector. According to Horback (2008), environmental policy and the existing regulations are seen as the main drivers of environmental innovations. Connecting Horback’s (2008) idea with the analytical framework of this thesis, I argue that environmental regulations or, in other words, “hard” rules form the structure to which the port agency is challenged to respond. Furthermore, the structural properties of the “hard” rules can influence the port agency to innovate. Respectively, innovative solutions in the port sector can successfully contribute to the mitigation of negative environmental impacts and even lead to commercial benefits (Yap and Lam, 2013).

Even though a relationship between environmental regulations and environmental innovations in the port sector has been noted scientifically, the novelty of the concept per se challenges its applicability in the port sector. According to Hall, et al. (2013), environmental innovations are relatively new arena in terms of competition in the seaport sector.

Before the analysis of environmental initiatives in two case ports, I find it necessary to clarify the definition of “environmental innovation”. I share the understanding of environmental innovations defined by Kemp and Pearson (2007, p. 7 cited in Bergh, et al., 2011):

“... a production, assimilation or exploitation of a product, production process, service or management or business method that is novel to the organisation (developing or adopting it) and which results, throughout its life cycle, in a reduction of environmental risk, pollution and other negative impacts of resources use (including energy use) compared to relevant alternatives”.

Considering the complexity and novelty of the concept of environmental innovations in port sector, I am going to analyse whether the port of Stockholm and the port of Klaipeda apply innovative management tools, solutions or technologies in order to respond to existing environmental regulations and supranational and national strategies which encourage the port sector to employ innovative initiatives. In the following section I analyse both on-going and completed environmental initiatives that take form of innovation in the ports of Klaipeda and Stockholm. Also, considering the framework introduced by Hall, et al. (2013), I classify environmental innovations in three main categories, that is, process, technological and policy innovations (see Figure 5). In addition, I support my analysis by utilizing the theoretical framework of the demand-driven innovations, namely regulation and support of private demand, as one of the factors stimulating the port actors to adopt environmental innovations.

Figure 5. Environmental innovations in the ports of Stockholm and Klaipeda (author’s compilation)

<b>Class</b>	<b>Port of Stockholm</b>	<b>Port of Klaipeda</b>
<b>Process/operational</b>	- the LNG bunkering solution - ship-shore power supply	- the LNG terminal (possibility to provide fuel corresponding to low sulphur emission standards)
<b>Technological</b>	- the photo voltaic system on one of the port’s buildings	- the adjustable hydraulic ramp in the Central Klaipeda terminal
<b>Policy</b>	- environmentally differentiated port dues until 1 January 2015 - the new environmental discount for LNG vessels, cold-ironing installation, and ships that reduce nitrous oxide emissions from 1 January 2015	- the discount in port dues for vessels having the Green Award certificate

## 5.2.2 The port of Stockholm: proactive approach to environmental issues

One of the Swedish governments goals defined in the report on the transport research was to be positioned as an ambitious and leading country in a transition towards sustainable society, not least in the transport sector (Statens offentliga utredningar, 2010: 74). The port of Stockholm, being an important hub for passenger and cruise shipping activities, contributes to the sustainable transport development goals by its constant efforts to develop environmental initiatives.

The port of Stockholm refers to its long-term efforts to increase environmental performance and presents itself as “one of the leading green ports in Europe” (Port of Stockholm, 2015a). According to the shipping line, operating in the port of Stockholm, authority: “Ports of Stockholm is already at the forefront, even internationally, when it comes to working to reduce environmental impact. This can be a matter of equipment and services for cleaner fuels, adapting to more energy efficient solutions” (Ports of Stockholm Annual Report, 2013, p. 22).

One of a few examples of environmental initiatives is the environmentally differentiated port dues implemented by the port of Stockholm in the 1990s. The environmental initiative was adopted as a result of a successful cooperation among SMA, Ports of Sweden and the Swedish Shipowners’ Association in 1996 (Sveriges Riksdag, Yttrande 1996/97: NU6Y). The goal behind the environmental initiative was to reduce emissions of nitrogen and sulphur dioxide from ships calling to the ports of Sweden by 75 percent (Mellin and Rydhed, 2011). In the agreement the suggestion to introduce environmentally differentiated port dues to port authorities was given on voluntary basis. The port of Stockholm followed the recommendation and introduced discounts for ships calling to the port of Stockholm in 1998 (Port of Stockholm, 2015b). The environmental discount was given to cruise vessels berthing in the port of Stockholm that have taken measures to reduce nitrogen oxide emissions (Port of Stockholm, 2014a).

According to the port of Stockholm authority, the decision to introduce environmentally differentiated port dues was a response to a rising demand from Stockholm inhabitants who were concerned over the increased pollution in the city from shipping activities in the port of Stockholm in the 1990s (Interview no.1). Another reason, according to the

port of Stockholm authority, behind the environmentally differentiated port dues was a will to:

“Increase the efforts among ship owners to reduce their environmental impact, this can be done via economic incentives. It is a question of the port’s position in these issues. In most ports, ships are the greatest source of pollution and as a port you need to apply all available measures” (Fridell, et al., n.d.).

Sweden was the first country in the world to introduce environmentally differentiated fairway dues to the ships calling to the Swedish ports. By the end of the 1990s approximately 20 out of total of 52 Swedish ports had followed the governmental recommendation and introduced environmentally differentiated port dues (Mellin and Rydhed, 2011). Thus, I argue that the public demand, existing innovative market-based policy tool on a national level and a will to keep environmentally friendly port image were the major factors which influenced the port of Stockholm to adopt the environmentally differentiated port dues in the 1990s.

An innovative local policy instrument of environmentally differentiated port dues was one of the major factors which triggered the shipping lines, calling to the port of Stockholm on a regular basis, to invest into nitrogen oxide reducing technologies. For example, the shipping company Silja Line invested in the direct water injection technology and installed it into the engines of one of its vessels called Silja Symphony in the end of the 1990s (Hyvättinen and Hilden, 2001). Hence, the support of private demand, namely the innovative port dues reduction instrument, encouraged the shipping line company to adopt proactive approach to environmental issues.

However, due to the new environmental regulation on the marine sulphur emissions, which came into force on 1 January 2015, the port of Stockholm authority had to reconsider environmentally differentiated port discounts introduced in the 1990s. According to the port of Stockholm authority, “the strategy behind environmental discounts was not to fulfil the law, but to go beyond the legal requirements” (Interview no. 1). As a result of the new environmental regulation which limited marine sulphur emissions from vessels operating in the SECA to considerable low level, that is, 0.1 percent the rhetoric of environmentally differentiated port dues lost its initial meaning.

According to the port authority: “a legal requirement was so low that there was no reason to provide a discount” (Interview no. 1).

Thus, from 1 January 2015 the port of Stockholm authority introduced a new environmental discount. One part of the discount applies for the vessels running on liquid natural gas (LNG) and another part of the new environmental initiative provides a financial contribution of one million SEK to the shipping lines willing to install the cold ironing equipment on-board necessary to connect the vessel with the on-shore electricity supply (Interview no. 1).

The cold ironing or, in other words, ship-shore power supply was defined as an environmental innovation by several authors (Hall, et al., 2013; Arduino, et al., 2013; Acciardo, et al., 2013). One could argue that the cold ironing attained considerable attention after the EU issued several documents concerning a use of marine fuel while berthed at the European ports. In 2005 the EU issued a legislation which has limited the amount of sulphur emissions to 0.1 percent while a vessel is berthing at European ports for more than two hours (Arduino, et al., 2013). Following year another recommendation came into being which encouraged the Member states to install the ship-shore energy supply facilities in the ports (Commission recommendation 2006/339/EC).

In order to operate the cold ironing system the port terminal should be equipped with additional electrical capacity and the infrastructure enabling to connect a vessel with the ship-shore power supply. A vessel, on its behalf, has to install the infrastructure enabling to receive the electricity. The system enables a vessel to turn off auxiliary engines which generate sulphur, nitrogen and carbon dioxide emissions, and allows connecting a ship with the onshore power supply while loading or unloading the passengers and cargo (Arduino, et al., 2013). However, despite widely acknowledged environmental benefits, there are still considerable limitations for the successful adoption of this environmental innovation. For example, ships do not have a uniform voltage and frequency requirements. The European grid frequency is 50 Hz while the frequency on-board may vary from 50 Hz to 60 Hz (Madjidian, et al., 2013). Also, there are considerable differences in possibilities to provide ship-shore power supply to passenger or cruise vessels and cargo vessels. Moreover, the passenger ships that moor in the port less than 2 hours are not required to connect to onshore power supply.

Finally, the ports having regular calls of passenger ships are more interested to install the shore-side power supply (ibid.).

The low-voltage shore-side power supply in the ports of Stockholm is not a new phenomenon. Two low voltage connections were installed in Stadsgården and Frihamnen terminals for the Viking Line and Tallink Silja vessels back in 1985 and 2006 respectively (Ericsson and Fazlagic, 2008). Thus, realising environmental and social benefits the technology of the cold-ironing suggests, the port of Stockholm have started to install shore-side power supply facility in its terminals long before the introduction of the EU legal requirements.

According to the City of Stockholm environment and sustainability strategist, one more shore-side power supply facility is being planned as part of the Smart grid project in the Stockholm Royal Seaport area (Interview no. 2). One of the objectives of the Smart grid project is to electrify the ships with the high-voltage connection facilities in order to reduce the carbon emissions from the ships while berthed (Interview no. 2). If implemented in accordance with the recommendations provided by the Stockholm Royal Seaport Urban Smart Grid pre-study, the city of Stockholm “would be unique in the world in providing electricity to all types of vessels at large number of berths with capacity of 40MW” (Fortum, et al., 2011). According to the interviewee, an on-going discussion at national level on how to increase the renewables in the whole Swedish electrical system considers to increase the use of wind power and solar energy. (Interview no. 2). Thus, if the Smart grid project is implemented successfully, the port of Stockholm would have a possibility to operate a high-voltage cold ironing facility which is perceived as environmental innovation. Moreover, the increase of the renewables in the whole electrical system would also mean that the ships would be partly powered by the renewable energy while berthed in the port of Stockholm.

Apart from the idea, currently being discussed, to increase renewables in the electrical system which could electrify the ships through the ship-shore power facility, the port of Stockholm authority has already implemented the idea of using the solar energy for the internal needs of one of its buildings at the Frihamnen terminal. The port of Stockholm authority initiated to build a photo voltaic system consisting of 919 solar panels on the roof of Magasin 6 building, the largest photo voltaic system in Stockholm. The project

was completed in June 2013 and currently covers approximately 15 percent of the annual building's energy needs (Port of Stockholm, 2014b).

The final example of the environmental innovations in the port of Stockholm relevant to the studied subject is the liquefied natural gas (LNG) bunkering solution provided for the shipping company's Viking Line vessel. The port of Stockholm was one of the first ports in the world which offered LNG bunkering infrastructure for the passenger ship Viking Grace in 2013 (Madjidian, et al., 2013). In the brochure presenting the new LNG bunkering solution the port of Stockholm emphasized: "Tougher regulations demand new solutions" (Port of Stockholm, 2014c). Hence, one might argue that increased environmental demands were one of the major factors which influenced shipping company Viking Line to explore more environmentally friendly marine fuel solutions. The cooperation among the shipping company Viking Line, the port of Stockholm and the company supplying the liquefied natural gas was the key for successful adoption of LNG bunkering infrastructure in the port of Stockholm.

To sum up, several examples of innovative environmental solutions introduced in the port of Stockholm reveal port authority's proactive attitude to environmental issues. Following Giddens's theoretical framework, innovation-driven environmental initiatives, that is, differentiated port dues, environmental discounts, the ship-shore power supply facility, the photo voltaic system and the LNG bunkering solution can be regarded as socio-technical cruxes of the port agency. All of these environmental initiatives represent different innovation-oriented port's development practices that correspond to the meta-level framework of innovation adopted in the EU strategy "Ports: an engine for growth". On the one hand, environmental discounts introduced in the 1990s could be considered as a demand-driven innovative policy tool which aimed to encourage the shipping lines to increase their environmental portfolio. On the other hand, the latter market-based policy instrument introduced on 1 January 2015, which gives the financial contribution for vessels to install the cold ironing equipment on-board, becomes a catalyst of environmental innovations per se. This new environmental discount introduced by the port agency can be regarded as a good example emphasizing how the port agency's actions affect the structure. In other words, by implementing innovative market-driven policy initiative the port agency constructs a new structure to which other port actors are challenged to respond. Apart from the innovative local policy instruments, the technological and operational innovations such as the cold-

ironing, LNG bunkering infrastructure and the photo voltaic system reveal the constant port of Stockholm authority's efforts to increase the environmental image of the port of Stockholm which directly corresponds to the local, national and supranational recommendations for sustainable transport development.

### 5.2.3 Emerging environmental innovations in the port of Klaipeda

The port of Klaipeda environmental responsibilities are defined in the national transport development strategies and action plans which comply with the supranational transport and environmental regulations (Interview no. 3). One of the strategic goals of the port of Klaipeda is to ensure the implementation of the existing environmental requirements in the port sector (Port of Klaipeda, 2015). According to the port of Klaipeda authority, the priority is given for ensuring the compliance with already existing legal environmental requirements, whereas for the development of supplementary or voluntary environmental initiatives is given a secondary attention (Interview no. 3).

However, stricter environmental requirements in the port sector become catalyst of innovative ideas and solutions even in those ports which do not aim to compete in terms of environmental portfolio. During the interviews with the port of Klaipeda authority and other port actors, I identified several environmental initiatives that take form of innovation in terms of decision-making, technology and operational activities.

One of the environmental initiatives that take form of innovation in terms of decision-making is the port discount provided for the vessels having a Green Award certificate (Interview no. 3). The port of Klaipeda was the first port in the Baltic Sea Region to introduce the rebate for vessels having the Green Award certificate in 2002 (Lietuvos Respublikos Susisiekimo Ministro įsakymas nr. 3-322). The Green Award Foundation was established in order to encourage the shipping companies to become more environmentally friendly in 1994. The Green Award is the voluntary certificate which can be received by the shipping operator that fulfilled certain environmental and safety standards (Mellin and Rydhed, 2011). According to the renewed legislation on Klaipeda seaport dues, 20 percent discount on waste reception facilities is provided for vessels having the Green Award certificate (Lietuvos Respublikos Susisiekimo Ministro įsakymas nr. 3-525). The local market based instrument introduced in the port of Klaipeda was also promoted on the EU level. The EC encouraged other European ports

to raise their environmental image by adopting similar market-driven initiatives (COM(2013) 295 final).

One of the technological innovations installed in a recently finished Central Klaipeda terminal is the adjustable hydraulic ramp which allows regulating a shore level when connecting a ship to a berth. According to the Central Klaipeda terminal authority, adjustable hydraulic ramps, which are quite commonly used in the western ports of the Baltic Sea, distinguishes the Central Klaipeda terminal from most of other ro-ro terminals situated on the eastern shore of the Baltic Sea (Zinkeviciute, 2015). According to the Central Klaipeda terminal authority, the adjustable hydraulic ramp could be considered as technological and environmental innovation that increase the speed of loading and unloading vehicles and decreases the pollution from cars and trucks (Interview no. 4). Due to this technological innovation, the vehicles are able to reach maximum allowed speed and do not have to stay in the harbour with the engines running for longer time than needed (Zinkeviciute, 2015).

Another environmental innovation, that is, cold ironing is present on the strategic development plan of the Central Klaipeda terminal (Interview no. 4). However, it is not completely clear when the actual implementation of the high voltage power supply facility could start. Meantime, several low voltage power supply facilities are provided in the port of Klaipeda to oil and product tankers, inland vessels, ferries and ro-pax ships (Savcuka, n.d.).

In addition, the LNG terminal based on a floating storage and regasification unit could be considered as technological and operational innovation launched in the port of Klaipeda. Lithuania was the first country among the Baltic States to complete the construction work of the LNG terminal in October 2014. By opening and operating the LNG terminal the state-controlled oil company Klaipedos Nafta, introduced an opportunity to supply the alternative fuel meeting low-sulphur environmental legislation for shipping lines and other smaller terminals in the Baltic Sea (Masiulis, 2014). Moreover, the opening of the LNG terminal per se increased the port's competitive position in the Baltic Sea Region. The LNG infrastructure could be utilized to provide the natural gas not only for domestic market but also meet the increased demand in environmentally friendly fuel by shipping lines operating in SECA in the future. According to estimations, approximately 25 percent of vessels will be using LNG fuel

by 2025 (Madjidian, et al., 2013). Following the Lithuanian maritime researcher's observation, "the port of Klaipeda appeared to be in a very fortunate position regarding the LNG terminal" (Interview no. 5).

The environmental regulation on sulphur emissions poses many challenges not only for shipping companies but also for port authorities and terminal operators. Due to the new environmental regulation, shipping lines are forced to use lower sulphur marine fuel from January 2015. There are several alternatives on how shipping lines could meet the present environmental legislation: install the exhaust gas scrubber, use the marine gas oil, use the marine diesel oil or choose an alternative of LNG (Madjidian, et al., 2013). According to the Lithuanian maritime researcher, "the new environmental requirement limiting sulphur emissions could be regarded as a good incentive to develop new solutions" (Interview no. 5). This notice corresponds to the Horback's (2008) idea on the role of regulation for the adoption of environmental innovations. In other words, the appearance of the new structure, that is, the new environmental regulation stimulates the port actors to search for new fuel alternatives. Moreover, their choices have a causal effect for port development planning. For instance, in case the shipping line operator chooses LNG fuel alternative, a port authority or a certain terminal operator has to provide a vessel with LNG bunkering solution.

Yet, the presence of LNG bunkering infrastructure in the port area does not necessarily imply that a shipping line operating in the port will choose the LNG fuel alternative. For example, the only Danish passenger ferry line group in Lithuania, that is, DFDS Seaways operating between the cities of Klaipeda, Karlshamn and Kiel decided to invest in installing exhaust gas scrubbers. According to DFDS Seaways authority, the decision to install exhaust gas scrubbers was made considering the possibility to use older ships in installing the scrubber technology (Interview no. 6). The exhaust gas scrubber is one of the innovative technological alternatives which remove the sulphur from the engine exhaust gas by using chemicals or seawater (Madjidian, et al., 2013). As a result, a vessel is enabled to meet the new environmental requirement on sulphur even by operating on high sulphur fuel oil.

Hence, the later claim that shipping line operator's decision has a causal effect for port development planning can be explained by a following example. Considering that the shipping line operator, that is, DFDS Seaways decided to install the exhaust gas

scrubber technology, the port of Klaipeda will have to adapt the port's infrastructure in order to be able to receive the waste water generated from the scrubbers. However, the discussion between the shipping line and the port of Klaipeda authority concerning the installation of waste reception from scrubbers is still on-going (Interview no. 5). The latter example illustrates how the structural properties of new environmental requirements affect the practices of the port agency. Also, it highlights how new environmental demands become the catalyst for the adoption of new solutions in the port sector.

To conclude, environmental initiatives in the port of Klaipeda are deployed using the rhetoric: "compliance with already existing environmental requirements". In the light of Giddens's theory of structuration, the practices of the port agency in connection with the environmental issues channel different port's development paths which are predefined by structural properties, that is, available resources and port's strategic development goals. Structural properties are an important factor to be considered since they "shape, channel, and facilitate system reproduction whenever it occurs by providing agents with the practical awareness of the practices, relations, and spatio-temporal settings" (Cohen, 1989, p. 201). For example, in the case of the port of Klaipeda, the port agency does not aim to compete in terms of environmental portfolio. Hence, the port agency maintains practical awareness of its strategic development objectives which are inscribed in the port of Klaipeda priorities. Simultaneously, the existing environmental requirements together with the port policy transformation, which encourage the port actors to adopt innovative environmental initiatives, set new agendas and priorities to the ports. The analysis of environmental initiatives in the port of Klaipeda revealed that the discount for the vessels having the Green Award certificate, the adjustable hydraulic ramp and the LNG terminal can be considered as a port agency's response to this policy transformation. However, only a few examples of environmental innovation-driven initiatives in the port of Klaipeda indicate that environmental innovations are in the stage of emergence.

### 5.3 Port and port-city interface: a medium for innovations

The analysis I perform in the section on the seaport and port-city interface directly corresponds to my third research question. In this part of empirical investigation I utilise

the framework of seaport – port-city interface and explore its role for the adoption of seaport-related innovations in the ports of Stockholm and Klaipeda. I argue that city municipalities, despite a fact whether they own the port or not, play a crucial role in ports politics. In other words, the interface between seaport and port-city might both enable and constrain innovation dynamics within ports. Hence, by analysing the relationship between the ports of Klaipeda and Stockholm and their home cities I aim to reveal whether networking and cooperation activities enable or constrain the port agency “to innovate”.

The concept of interface was defined as “a zone of conflict and interaction” (Hayuth, 1989 cited in Daamen and Vries, 2013, p. 5). Recently, emergence of re-integration activities and sustainable co-habitation between port-cities and seaports was recognized by Verhoeven (2010) and Daamen, et al. (2013): “Contemporary urban redevelopment schemes are even thought to enhance port-city integration, something that has not been seen since the time industrial and commercial growth started to drive ports and cities apart” (Hoyle 2000 cited in Daamen and Vries, 2013, p. 5).

The new tendency regarding re-integration activities between seaports and port-cities is also inscribed in some strategic transport planning documents. For example, in the report on the long-term transport planning issued by Swedish Transport Administration a note concerning an effect of new urban planning trends to the transport system is mentioned (Trafikverket, 2014). Ports, being a part of transport system, together with the city administrations are increasingly challenged to find new solutions for mutual co-habitation. Moreover, the port policy transformation towards the engines for growth set a new agenda and priorities for ports. For instance, ports need to find a balance between their activities, environmental issues and consider how their activities might affect densely populated surrounding urban areas (COM(2013) 295 final). Following Giddens’s (1979) theory of structuration, port actors are challenged to respond to this new structure which calls for certain kind of agency. Agency or, in other words, activities of the port actors are supposed to enable ports for growth while ensuring environmental sustainability and seaport – port-city co-habitation.

The project of the Stockholm Royal Seaport, which is administered by the City of Stockholm municipality, is a good example illustrating the emerging port-city and seaport sustainable co-habitation. The whole project idea could be considered as

innovation per se which was created as a result of the successful cooperation between the City of Stockholm and other stakeholders including the port of Stockholm authority. The reconstruction of Stockholm Royal Seaport area has started in 2010 and is planned to be finished by 2030. Moreover, the whole Royal Seaport project is included in the global Clinton Climate Initiative and Climate Positive Development network (Interview no. 1 and interview no. 2).

Stockholm Royal Seaport aims to be regarded as the “role model” for sustainable city development which targets to create a “smart” area with the capacity of 20,000 residents and 50,000 workers; the new city area is planned to be used for testing innovative technologies and services in transport, energy and health care (Angelidou, 2015). Thus, a variety of projects is being implemented in the Stockholm Royal Seaport district in order to reach the high sustainability and environmental targets. According to the City of Stockholm sustainability strategist, Innovation arena which is situated in the Stockholm Royal Seaport area have been used as one of the platforms to stimulate the dialogue and exchange of innovative ideas among various stakeholders involved in the Stockholm Royal Seaport development (Interview no. 2).

The port of Stockholm including Värtahamnen and Frihamnen terminals is part of the Stockholm Royal Seaport development project. As noted in the Stockholm Royal Seaport vision, the city of Stockholm and the port is working together in order to create a sustainable urban area and modern port district which could accommodate cruise and passenger vessels (City of Stockholm, n.d.). The port of Stockholm is currently reconstructing entire Värtahamnen terminal and building a new passenger terminal which is planned to be opened in 2016. According to the port of Stockholm authority, the main idea behind the project was to free the land which could be used by the City of Stockholm for building new houses (Interview no. 1). As a result, the port of Stockholm and the City of Stockholm municipality agreed to construct a new pier on the water which could accommodate the new Värtahamnen passenger terminal. According to the interviewee, the oil and container terminals are also going to be moved out from the area, leaving the place only for cruise and passenger ferry business (Interview no. 1).

The cooperation among the City of Stockholm urban planning department and the port of Stockholm creates new possibilities for a sustainable port-city and seaport co-

habitation. The port of Stockholm environmental initiatives reinforces the environmental goals of the Stockholm Royal Seaport district. In addition, a new infrastructure for passenger and cruise vessels increases the strategic position of the port of Stockholm in the Baltic Sea Region (City of Stockholm, n.d.). Hence, by developing innovative modes of cooperation both parties benefit from mutual co-habitation.

Considering the situation in the port of Klaipeda, one must recognise that unlike the port of Stockholm, which is the municipality-owned private company, the port of Klaipeda is the state-owned enterprise. Thus, the cooperation between the port of Klaipeda and the City of Klaipeda municipality might face more challenges in terms of finding new ways to tackle the pollution in the city which is caused as a result of the intensive cargo shipping operations as well as the activities of cruise and passenger ships. Moreover, on-going discussion concerning the construction of the outer deep-water port in Klaipeda creates conflict situations among politicians in the national government, City of Klaipeda municipality and other interested parties.

A plan to build the outer deep-water port in Klaipeda is of strategic importance to the port of Klaipeda. By enabling the port to accommodate the largest tonnage tankers that enter the Baltic Sea, the deep-water port would increase the port's competitive position on the eastern shore of the Baltic Sea. However, innovative idea which started its development path already in the 1990s implies that political factors have a tremendous impact upon its implementation possibilities. In addition, the lack of common vision between politicians at national level, city of Klaipeda municipality and local actors results in the prolonged implementation of the project. According to the latest available information, currently the port of Klaipeda authority is waiting for the general plan of the Klaipeda port territory to be completed by 2017 (Port of Klaipeda, 2014). According to the port of Klaipeda territory's general plan, the special plan for the outer deep-water port could be prepared.

The complexity of the bureaucratic procedures is not only one factor challenging construction plans of the outer deep-water port. The interface between the City of Klaipeda administration and national government, which is responsible for planning procedures of the outer deep-water port, proves to be a zone of conflict. In other words, it reveals how the existing structure can constrain the actions of the port agency. For example, after being informed upon the plan to build the outer deep-water port in the

city of Klaipeda territory, the mayor of the City of Klaipeda asserted that it is a mistake and an incorrect step which was taken by the state government regardless the position of the City of Klaipeda administration and the position of the city inhabitants (Vakary Ekspresas, 2013). In addition, according to the port of Klaipeda authority, due to changes in the political leadership at the national government the vision towards the construction of the outer deep-water port has been changing several times since the 1990s (Petronienė, 2015).

However, the analysis I performed on the interview material with the port of Klaipeda authority and other port stakeholders has also revealed another side of the port-city and seaport interface, that is, the cooperation activities between the City of Klaipeda administration, port authority and the private terminal operators are becoming increasingly integrated. For example, according to the Central Klaipeda terminal authority, the City of Klaipeda has been working in order to develop the city area around the Central Klaipeda terminal since 2005 (Interview no. 5). As a result, the city area in proximity to the port was re-invented i.e. new shopping malls, entertainment centres were built and the road infrastructure was improved.

To conclude, sustainable co-habitation practices between seaports and port-cities can be regarded as an outcome that has been enabled by the structure-agency dynamics. In some cases the seaport – port-city interface becomes a medium stimulating the innovative modes of cooperation resulting in “re-invention” practices. The example of the Stockholm Royal Seaport development project indicates that a common vision between the City of Stockholm urban planning department and the port of Stockholm authority stimulates the port and the city to “re-invent” themselves. I suggest that this “re-invention” practice, that is, “Stockholm Royal Seaport” can be regarded as innovation in the context of seaport – port-city interface. Nevertheless, following Giddens’s (1979) thinking, the character of the duality of structure not only enables but also constrains the activities of agency. Hence, structure-agency dynamics can also lead to a constraint of actions. The example of prolonged attempts to construct the outer deep-water port in the case of Klaipeda can be perceived as a zone of conflict which resulted to the constraint of port agency’s actions. Therefore, the analysis also revealed that seaport – port-city interface can both stimulate and prolong the implementation of innovative ideas in port sector.

## VI. DISCUSSION: FROM *INNOVATION* IN POLICY DOCUMENTS TO PORT PRACTICES

*Ordinary people cannot be innovative all of the time. However, if somebody gives them a target...*

Akio Morita

The neoliberal growth model emphasizing the role of innovations for increasing the competitive advantage of individuals, firms and even territorial entities considerably affected supranational and national port policy discourse. Lately, within the EU port policy and strategy documents, ports turned to be regarded as “engines for growth”. Respectively, the concept “Ports: engine for growth” opened a new window for interpreting the notion of innovation in port sector; a broader understanding of innovation has been introduced. The concept of innovation started being considered not only in terms of technological but also management and organisational developments which could take place in port sector and increase port’s competitive advantage.

The analysis of innovation-driven activities in the ports of Klaipeda and Stockholm reveals that both ports can be positioned within the new narrative of innovation established in supranational and national port policy documents. The intensity of innovation-driven practices, be it technological, process or policy innovations allows locating the ports within the new policy perspective, that is, “ports: engines for growth” (see Figure 6, p. 66). Following Giddens’s (1979) theory of structuration, a port policy transformation towards engines for growth conditioned the emergence of the new structure. Realising the interdependence between structure and agency, the port actors, who I define as port agency, are challenged to respond to this new structure which encourages them to deploy innovation-driven practices. Hence, the main categories of empirical cases, that is, port’s governance, environmental initiatives and seaport – port-city interface can be regarded as three main trajectories through which I trace the relationship between the changed port policy orientation and actual innovation-driven port practices.

Figure 6. Innovation-driven practices (author's compilation)

Case study characteristics	The port of Klaipeda	The port of Stockholm
Innovation in port governance and port actors' approach to innovations	<ul style="list-style-type: none"> <li>- Innovative activities located in port's terminals and other private companies operating in the port area.</li> <li>- The port authority is not the chief motivator encouraging port actors to adopt innovations.</li> <li>- Innovation per se not prevalent phenomenon in port's governance.</li> <li>- Innovation initiated by the port authority: freight and goods information system.</li> <li>- Innovation per se not in the top priority list of the port authority.</li> <li>- Port actors' attitude to innovation varies:               <ol style="list-style-type: none"> <li>1) port authority interprets the notion of innovation as product or process innovation.</li> <li>2) representatives from private port companies and researchers refer to innovation as change in the course of action; construction of new infrastructure which was not present in the port area before; organisational and technological changes in the port sector.</li> </ol> </li> </ul>	<ul style="list-style-type: none"> <li>- The port of Stockholm authority prefers to use <i>position</i> rather than <i>innovation</i>.</li> <li>- Innovation present in port's management and governance activities (visible through particular port priorities i.e. environmental initiatives).</li> <li>- Innovation per se not in the top priority list of the port authority.</li> <li>- Port actor's attitude to innovations:               <ol style="list-style-type: none"> <li>1) port authority employs term innovation cautiously. Improvements in the port area not necessarily understood in terms of innovation.</li> <li>2) port stakeholders define the term innovation broadly: innovative means of communication, business models, service development, and technological advancements.</li> </ol> </li> </ul>
Environmental innovations	<ul style="list-style-type: none"> <li>- Follower in environmental innovations.</li> <li>- Port actors approach to environmental issues: "fitting current environment regulations".</li> <li>- Environmental innovations in the port:               <ol style="list-style-type: none"> <li>1) discount for the ships having the Green Award certificate.</li> <li>2) the adjustable hydraulic ramp in Central Klaipeda terminal.</li> <li>3) the LNG terminal (possibility to provide "green" fuel to ships).</li> </ol> </li> </ul>	<ul style="list-style-type: none"> <li>- Leading port in environmental innovations.</li> <li>- Proactive approach to management of environmental issues: "to go beyond legal environmental requirements".</li> <li>- Environmental innovations in the port:               <ol style="list-style-type: none"> <li>1) environmentally differentiated port dues in force until 1 January 2015.</li> <li>2) demand-driven port environmental discount system encouraging port users to invest in green technologies.</li> <li>3) cold-ironing.</li> <li>4) the photo voltaic system on the roof of one of the port buildings.</li> <li>5) the LNG bunkering infrastructure.</li> </ol> </li> </ul>
Port and port-city interface	<ul style="list-style-type: none"> <li>- Emerging pattern of more integrated port of Klaipeda and City of Klaipeda activities.</li> <li>- Construction of the outer deep-water port, which is an innovation in the context of the port of Klaipeda, creates challenges for port-city and seaport co-habitation.</li> </ul>	<ul style="list-style-type: none"> <li>- Stockholm Royal Seaport development project – innovation per se. The example of port-city and seaport working in the same direction.</li> <li>- Close cooperation between the City of Stockholm and the port of Stockholm authorities results in sustainable port city and seaport co-habitation.</li> <li>- Common vision and integrated approach concerning environmental issues.</li> </ul>

### *Governance context*

More recently, the emphasis on innovation in port policy documents has broadened. Thus, I have analysed how or whether at all the changed notion of innovation at policy level affected port actors' rhetoric and if the notion of innovation is incorporated in port governance practices. I have argued that by exploring port actors' approaches to innovations, one can learn about the innovation dynamics in two different profile ports.

De Martino, et al. (2013) emphasized critical role of port authority in coordination of port activities and in promotion of culture of innovations in ports. Acknowledging port authority's role in creation of favourable environment for adoption of innovations, this master's thesis also highlighted the importance of other port actors' approaches to seaport innovations. According to Verhoeven (2010, p. 250): "treating the port as a single unit would indeed lead to partial or even wrong conclusion". In addition, following the theory of structuration "all social phenomena, and especially the functioning of all social institutions, should always be understood as resulting from the decisions, actions, attitudes, etc. of human individuals ..." (Popper, 1966 cited in Giddens, 1979). In other words, the port agency's perceptions and decisions have a considerable influence for the deployment of innovation-driven practices in the port locales. Therefore, it was of utmost importance to consider not only port authorities' attitudes to innovation per se, but also to explore other port actors' and experts' approaches to the studied phenomenon.

The analysis revealed that importance of innovation displayed in various port policies, strategies and development planning documents sometimes contrasts with actual port authorities' and other port stakeholders' perceptions of innovations. For example, the examination of the port authorities' attitudes towards innovations in both ports revealed that the goal "to innovate" is not in the top priority list neither in the port of Stockholm, nor in the port of Klaipeda. Moreover, the study has disclosed variegated perceptions regarding the notion of innovation. Some port actors perceive seaport innovations merely as technological advancements. I argue that such perspective corresponds to the innovation narrative which was prevalent in the port policy documents in the 2000s. Meanwhile, some port actors notice that seaport innovations should also be perceived in terms of organisation and management. The latter narrative of innovation directly

corresponds to the new port policy perspective “Ports: engines for growth” in which the notion of innovation is also perceived in terms of management and organisation. Recognizing that there is no single explanation regarding how the port agency constructs the understanding of seaport innovations, I suggest that the problem of the concept of innovation in general, which implies that the term innovation does not have a universal definition, leads to its variegated interpretation. Consequently, the definition of seaport innovations becomes no exception.

Referring to the above-mentioned note in connection with Giddens’s social theory of structuration, I suggest that port agency’s perceptions regarding seaport innovations are important element for the production of social practices. The port agency’s cautious attitude to seaport innovations, which I identified in my analysis, corresponds to Arduino, et al. (2013) comment regarding the deployment of innovative initiatives in the port sector. The authors in their study concluded: “The port sector appears to be rather conservative in introducing innovation in its processes. May be this is a consequence of a network of players deeply interrelated either horizontally and vertically, with a great use of standards, that slows down the adoption of innovations” Arduino, et al. (2013, p. 105).

Nevertheless, even though port actors do not place innovation per se on the port’s priority list, this fact does not allow making presumption that both ports are absent in deploying innovative initiatives. My analysis reveals that the port of Klaipeda authority’s role in creation of innovation environment in the port sector is quite limited. Due to the landlord port governance model, most of the innovative initiatives are undertaken by private companies operating in the port area. As a result, the majority of innovations can be found in technologies integrated in private terminals rather than in the port of Klaipeda authority’s governance activities. Considering that “terminals rather than ports are adversaries in the competitive struggle within the port industry” (Van de Voorde and Winkelmanns, 2002), this tendency can be regarded as a logical outcome. Yet, it also leads to the conclusion that a vision of how organisational and management innovations could be incorporated in the port authority’s governance activities is still in its emerging stage.

The case study results on innovation and port of Stockholm governance practices show that the port of Stockholm authority is more inclined to relate port’s development

activities to the port's strategic objective, that is, corresponding to the customer's demand than associate the port's development with innovations per se. Nevertheless, "port's position" and the strategic key priorities i.e. environmental sustainability instigates the port agency to search for new solutions which often emerge as technological, management and organisational innovations. For example, the environmentally differentiated port dues system, the environmental discount, the cold-ironing, the seaport and the port-city sustainable co-habitation practices.

I argue that a port's governance model along with port's development priorities and general innovation environment within a country are major factors that influence the deployment of innovation-driven practices in ports. According to Giddens (1979, p. 95), "structural elements necessarily enter into characterisation of action". In other words, existing rules and resources determines the agent's behaviour and actions. For instance, general innovation climate in Lithuania compared to Sweden is relatively moderate. Moreover, the state-owned port of Klaipeda authority's activities which have a close relation with decisions adopted by the government unlike the port of Stockholm agency's activities which are based on business planning are less likely to result in management and organisational innovations. In addition, private companies operating in the landlord port model, rather than port authority, tend to be more open for adopting innovations. Hence, the above-mentioned factors allow making conclusion that the new port policy orientation promoting the culture of innovations in port sector can have a different effect on ports. This is a consequence of the national and port individuality and different resource capacities.

### *Environmental context*

The analysis on environmental innovations revealed that the port of Stockholm can be positioned as a leading port in the Baltic Sea Region in both developing and applying environmental innovations. According to Gritsenko and Yliskylä-Peuralahti (2013), ports can act as leaders and can offer themselves as venues in promoting environmentally friendly shipping. The port of Stockholm strategic development goals are intertwined with ambitions on sustainability that lead to continuous deployment of innovative environmental initiatives.

In the frame of Giddens's (1979) social theory, the structural properties, that is, port of Stockholm strategic development goals and resources can be regarded as key elements which encourage the port agency to develop innovation-driven initiatives. Simultaneously, by responding to the structure and by developing innovative environmental initiatives, i.e. environmentally differentiated port dues and environmental discounts, the port of Stockholm agency also creates preconditions for the emergence of certain structures which respectively channel different kind of development prospects or impediments for other port actors involved in the "reproduction of social practices" (Giddens, 1979). For instance, the innovative demand-driven environmental discount system introduced by the port of Stockholm authority on January 2015 can be regarded as the new structure which both enable and constrain the port agency "to innovate". On the one hand, structural properties of the new environmental solution, that is, a discount in port dues for LNG vessels and financial contribution to vessels willing to install the cold ironing equipment on-board can become catalyst of innovations per se, promoting the port users to adopt green practices. In other words, even though the shipping line operator is not concerned about the environmental sustainability, the market-oriented tool ensuring the financial contribution might encourage the port actors to install cold ironing technology or choose the LNG fuel alternative. On the other hand, the same environmental discount can have a different impact for those port actors whose resources to invest in LNG vessels or the cold ironing technology are limited. From this perspective, the new environmental discount becomes an impediment preventing the port agency to receive a discount in port dues.

Positioning the port of Klaipeda within the new narrative of innovations becomes more challenging since innovative practices in the port of Klaipeda are not clustered within one particular area. Giddens's (1979, p. 55) social theory of structuration emphasizes that "actions do not refer to a series of discrete acts combined together, but to a continuous flow of conduct". Therefore, realizing that the port of Klaipeda agency's environmental initiatives cannot be interpreted in terms of "continuous flow of conduct", I suggest that the port of Klaipeda agency could be positioned as a follower in implementing environmental innovations. My analysis reveals that the port of Klaipeda authority's goal is to ensure "the compliance with already existing environmental requirements". Thus, the port agency does not aim to develop supplementary

environmental initiatives going beyond environmental requirements because the economy vs. environment narrative is considerably stronger in the port of Klaipeda. Yet, the discount in port dues for the ships having the Green Award certificate, the adjustable hydraulic ramp in the Central Klaipeda terminal and the LNG terminal can be regarded as socio-technical cruxes of the port agency, that is, objects that channel different port's development practices.

Hence, I suggest that port agency in the ports of Klaipeda and Stockholm is not capable to respond to the new innovation-oriented policy perspective in the same way due to the agency's individual speciality which is predetermined by general national innovation environment, historical path dependence, port's management system, ownership and port's development priorities. Despite of the existence of the same structure, i.e. innovation oriented port policy and environmental regulations, the port agency in both of the ports acts in different ways. In the port of Stockholm the port agency employ proactive approach to environmental issues, whereas the port of Klaipeda agency becomes a follower in implementing environmental initiatives.

Employing the narrative of historical path dependence such tendency could be explained by engaging in a discussion with historical "legacies". For example, the port of Stockholm has a history of approximately forty years in working with environmental issues (Port of Stockholm, 2015b). The first environmental initiatives date back to the 1970s (ibid, 2015b). On the contrary, the port of Klaipeda activities were limited until Lithuania together with the other post-communist countries re-emerged with the collapse of the Soviet Union in the 1990s. The Commercial Port in which the Soviet Union established the navy fleet after the World War II was reorganised to the state-owned enterprise in the beginning of the 1990s. Thus, one can argue that meanwhile the port of Stockholm was operating in the framework of market-driven economy and, therefore, was able to deploy environmental initiatives, the port of Klaipeda agency's capabilities to work with environmental issues were predetermined by historical path dependence.

Acciaro, et al. (2013) attempt to elaborate on environmental innovations in the port sector considering different ports authority's functions and ports institutional environment delivered rather interesting results which would be relevant to compare with the findings of this research. According to Acciaro, et al. (2013), environmental

innovations in port sector appear to be the most successful where the port function of community manager is relatively strong. After conducting a case study, the authors concluded that ports' ambitions to market the green image of the port, stimulate the port users to adopt green practices, increase visibility and ensure coordination of green activities tend to score more high in those ports that possess a strong community manager function (ibid, 2013). Meanwhile, the ports performing under the landlord management system tend to raise their concerns regarding the protection of ecosystems in the port area and include environmental considerations in planning the port infrastructure (ibid, 2013). The authors concluded that innovations do not appear to be the most successful as far as green objectives of the landlord port model are concerned, whereas the green objectives of a port, possessing active port community manager functions, seem more likely result in innovations.

Even though the results of case studies cannot be generalised, the findings of this master's thesis concerning the ports of Klaipeda and Stockholm environmental initiatives can be linked to the conclusions drawn in the above-mentioned study. The port of Stockholm authority, possessing a strong community manager function and holding the proactive attitude towards environmental issues, deploy innovative demand-driven initiatives stimulating the port users to adopt green technologies. Meantime, the activities of the landlord port authority, that is, the port of Klaipeda are predefined by two important factors. Firstly, port actor's approach corresponding to "fitting current environment regulations framework" presuppose that economy vs. environment narrative is considerably strong in one of leading ports in annual cargo turnover on the eastern shore of the Baltic Sea. Secondly, landlord port management system requires balancing between different port stakeholder interests. In other words, in order to implement environmental innovations, other than technological ones that could be deployed by private operators alone, the cooperation between port authority and private terminal operators becomes of utmost importance. For example, an effective environmental discount, as in the case of port of Stockholm, would require a common agreement between a private terminal operator and the port authority since the port dues are being collected by both private terminal authorities and the port of Klaipeda authority. Thus, one can make a conclusion that implementation of environmental innovations in ports performing under the landlord port model becomes more complex.

### *Port and port-city interface*

The analysis on the port and port-city interface revealed that novel co-habitation practices between seaports and port-cities can not only enhance the dynamics of innovation but can also become an impediment in deploying seaport innovations. In the framework of Giddens's (1979) theory of structuration, I suggest to perceive the seaport – port-city interface as an outcome that has been enabled by structure and agency dynamics. In other words, the new rules and regulations, which Giddens (1979) defined as structure, and which I identified in this study as changed port policy orientation that encourage the port actors to search for innovative sustainable co-habitation practices in dialogue with port-cities, create the new structure to which the port agency has to respond. Thus, the new structure encourages ports and port-cities to “re-invent” by developing innovative cooperation practices.

In the light of Giddens (1979) theory of structuration, two case study examples, that is, the Stockholm Royal Seaport development project and the outer deep-water port in Klaipeda can be regarded as objects through which the port agency channel port development and “re-invention” practices. From both cases emerges that port and port-city interface “as a zone of conflict and interaction” is entangled in the production of actions in diverse ways. The analysis on the Stockholm Royal Seaport development project reveals that seaport – port-city interface becomes a medium of innovations. The port of Stockholm authority and the City of Stockholm share a common vision towards integrating the port activities and the urban planning. Hence, the Stockholm Royal Seaport development project which is innovation per se enables the port of Stockholm and the City of Stockholm become spearhead in implementing innovative seaport and port-city co-habitation practices.

The other example of the outer deep-water port in Klaipeda, which is an innovative idea in the context of the port of Klaipeda, showed that seaport and port-city interface can become a zone of conflict. Therefore, the lack of common vision regarding the implementation of the project idea per se becomes an impediment for the port agency. However, Giddens's claim that all the constraints are also enablements, that is, “no matter how severe constraints may be they always establish opportunities for some more or less extensive range of activities which enables actors to intervene in social life” (Cohen, 1989, pp. 214-215) allows making the following conclusion. Even though

the conceptual idea of the outer deep-water port was challenged by the development of diverse understandings, the interaction between structure and agency is constant. Therefore, new rules and regulations might channel different port's "re-invention" practices.

## CONCLUSIONS

This master's thesis has investigated innovation-driven practices in port sector by considering two cases: the port of Stockholm and the port of Klaipeda. The purpose of the research was to make a contribution to knowledge building in exploring how the notion of innovation, established in various supranational and national port policies and development planning documents, is deployed in port environment through the lens of port governance, environmental initiatives and seaport – port-city interface.

The analysis I conducted on port policies revealed two important perspectives. Firstly, innovation discourse in supranational and national port policies and development planning documents has increased significantly since the beginning of the 2010s. I argued that neoliberal economic thinking emphasizing the role of innovations for governments, institutions, business and individuals increasingly affected policy-making practices. As a result, the transition of policy orientation regarding ports, that is, the shift from “functional terminals” to “engines for growth” has catalysed the new policy perspective on port sector that emphasises innovation-related rhetoric in planning documents. Secondly, the notion of innovation encouraging the “culture of innovations” in port sector has broadened. Within the narrative “Ports: engine for growth” the concept of innovation started to be interpreted considering not merely technological but also management and organisational innovations. Consequently, this new innovation-oriented policy perspective encourages the adoption of technical innovations and development practice-based innovations in more mundane port activities i.e. port management and organisation. Hence, this novel innovation agenda is visible in several topics I analysed in the study, for example, in port governance, environmental issues, seaport – port-city interface and in several technical issues.

The empirical investigation regarding the first research question, that is, the analysis on linkage between port governance and innovations likewise the exploration of port actors approach to innovations in general revealed several important issues. From both cases emerges that neoliberal ideas imprinted in supranational and national port policies, strategies and development planning documents are often contested in daily port practices. In other words, my analysis shows that the port authorities' and other port actors' attitudes towards innovations do not necessarily correspond to the new narrative of innovation and do not always “fit” within a framework of neoliberal economic

thinking that glorifies the “culture of innovations”. Innovation per se is not being perceived as the key factor contributing to port’s competitiveness neither in the port of Stockholm nor in the port of Klaipeda. In addition, port actors’ understanding and the perceptions of what innovation actually is and how it can be integrated in mundane port activities also varies. This conclusion can be contextualized within Giddens’s (1979) theory of structuration which emphasizes the importance of mutual dependence between structure and agency. My results show that the same structure, which can be interpreted in the context of both ports in terms of existing rules, resources and the shifted policy agenda, can have a different effect for port agency’s perceptions and, therefore, can influence different innovation-driven practices. Also, the analysis reveals that the ability to develop innovative initiatives in the port sector is strongly predetermined by the local conditions, a port’s governance model, the way port actors perceive the importance of innovations per se, demand factors and new regulations.

For example, as far as the port governance is concerned, the analysis reveals that landlord based port management model existing in the port of Klaipeda implies that innovative initiatives are undertaken by private companies operating in the port area. On the other hand, the port of Klaipeda authority does not take the chief motivator’s role in encouraging the other port actors to adopt innovations. In the case of the port of Stockholm, the authority’s role in adoption of innovative demand-driven initiatives is the most visible in environmental agenda and port’s cooperation with the City of Stockholm activities.

The empirical analysis corresponding to the second research question, namely, the study on innovation-driven environmental practices in the ports of Klaipeda and Stockholm shows that both of the ports can be positioned in the frame of the new port policy orientation, that is, “Ports: engine for growth”. My results reveal that existing structure in the port of Stockholm enables the port agency to become spearhead in adopting innovative environmental solutions. The examples of innovative initiatives such as environmentally differentiated port dues, newly introduced environmental discounts, the cold-ironing, the LNG bunkering infrastructure and the photo voltaic system can be regarded as key elements through which the port authority channels its proactive approach to environmental issues. On the contrary, the port of Klaipeda agency’s impetus to increase environmental portfolio by adopting innovative tools could be described as being moderate. The analysis revealed that the port agency does not aim to

compete in terms of environmental portfolio, therefore, the rhetoric of the port agency corresponds to “compliance with already existing environmental requirements”. Nevertheless, the examples of the discount for the vessels having the Green Award certificate, the adjustable hydraulic ramp and the LNG terminal can be considered as means by which the port agency respond to the structural properties, that is, stricter environmental regulations.

The analysis I performed regarding the third research question revealed that seaport – port-city interface can both enable and constrain port agency from implementing innovation-driven practices. Considering Giddens’s (1979) theory of structuration, the seaport – port-city interface can be regarded as an outcome that has emerged as a result of the port policy transformation towards “engines for growth” which encourages the port and port-cities explore and implement innovative modes of sustainable co-habitation. Hence, the Stockholm Royal Seaport development project is the example representing the emerging sustainable co-habitation practices between seaports and port-cities. Meanwhile, the case of the outer deep-water port in Klaipeda shows that seaport – port-city interface can become the zone of conflict which consequently results in the prolonged opportunity to implement innovative idea in the port of Klaipeda.

Thus, by focusing on my research goal and by addressing three above-mentioned research questions my study revealed that the ports, as “engines of growth”, can be positioned in the frame of innovation-driven economy and its suggestive narrative. In this context, the ports are perceived as proactive nodes in networked machinery of neoliberal growth, as bearers of their individual speciality and competitiveness in the value-driven chain system. The port’s individual speciality becomes crucial element determining how strongly the new innovation narrative is rooted in the rhetoric of the port’s governance and realized in mundane ports’ activities.

Acknowledging that present master’s thesis was an early attempt to investigate interdependence between the new innovation discourse in port policy documents and actual innovation-driven practices in the ports of Klaipeda and Stockholm, and recognizing that researchers’ interests in exploring innovation dynamics in port sector are in emerging stage, I should elaborate upon shortcomings and possibilities for further research.

First of all, it is essential to recognize existing difficulties of shaping or influencing the process of innovation. Hekkert, et al. (2007) indicates that it is challenging to measure which activities foster or hamper innovation performance. Thus, following questions such as how one should measure innovation in port sector, which port practices can be considered as innovation-driven came along this master's thesis research path. Relying on Greenhalgh and Rogers (2010) suggestion that one way in determining innovation is to ask the company or community about their activities, I have collected interviews with port and maritime experts. Each interview contributed to knowledge building of how innovation dynamics could be interpreted in the port of Klaipeda and Stockholm. However, considering that the term innovation is ever-changing phenomenon (Miettinen, 2002) containing various modes of interpretation and that each seaport has its own unique characteristics predefined by historic legacies and socio-economic environment, some of the results of this case study cannot be generalised. Moreover, the interpretation of innovation dynamics in both ports is based on semi-structured interviews, taking into consideration that an agent, i.e. port expert "could have acted otherwise" (Giddens, 1979). In other words, at any point in time during the conduct of the interview the port agent or other expert could have chosen to strengthen or suppress their argumentation regarding innovation-driven initiatives.

Nevertheless, recognising that port actors' approaches towards the studied phenomenon and innovation-driven activities in both of the ports may be changing, the present research uncovered how shifting innovation agenda in policy documents is reflected in two different ports of the Baltic Sea Region. Hence, this study was an early attempt to trace seaport-related innovation practices in the geography of the Baltic Sea Region. Therefore, the added value of this master's thesis is twofold. Firstly, I have reframed the port-related policy development by tracing and identifying the port transformation from "functional terminals" to "engines for growth". Secondly, I have analysed empirically, utilizing various examples, that is, port governance, environmental initiatives, and seaport – port-city interface, the variegated means through which the ports have become increasingly entangled in the planning logic of neoliberal innovation-driven economy and also discussed why this development has become to some extent imperative for the ports.

Yet, the question of innovation-driven practices in seaports is much larger than addressed in this thesis. As a result, there is much room for further research in exploring

how the port policy transformation towards engines for growth, which I identified in this study, affected innovation dynamics of the other ports of the Baltic Sea Region, in particular, competing, adjacent and sharing similar characteristics ports of the region.

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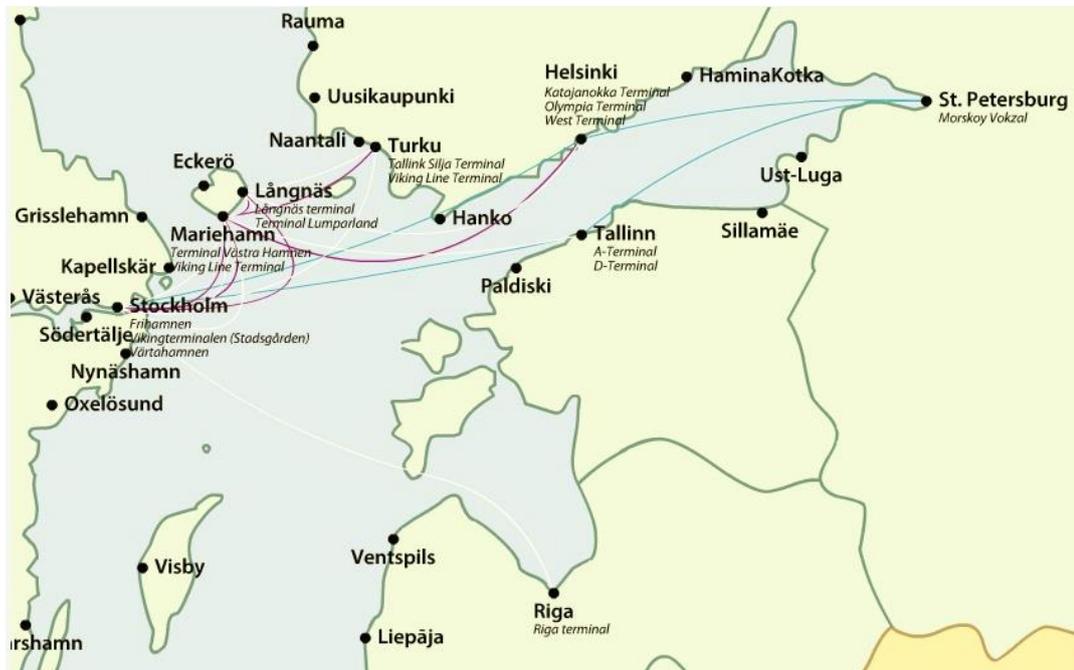
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## APPENDIXES

**Appendix 1** (Baltic Transport Maps, 2015 [online] Available at: <http://www.baltictransportmaps.com>> Accessed 10 June 2015)

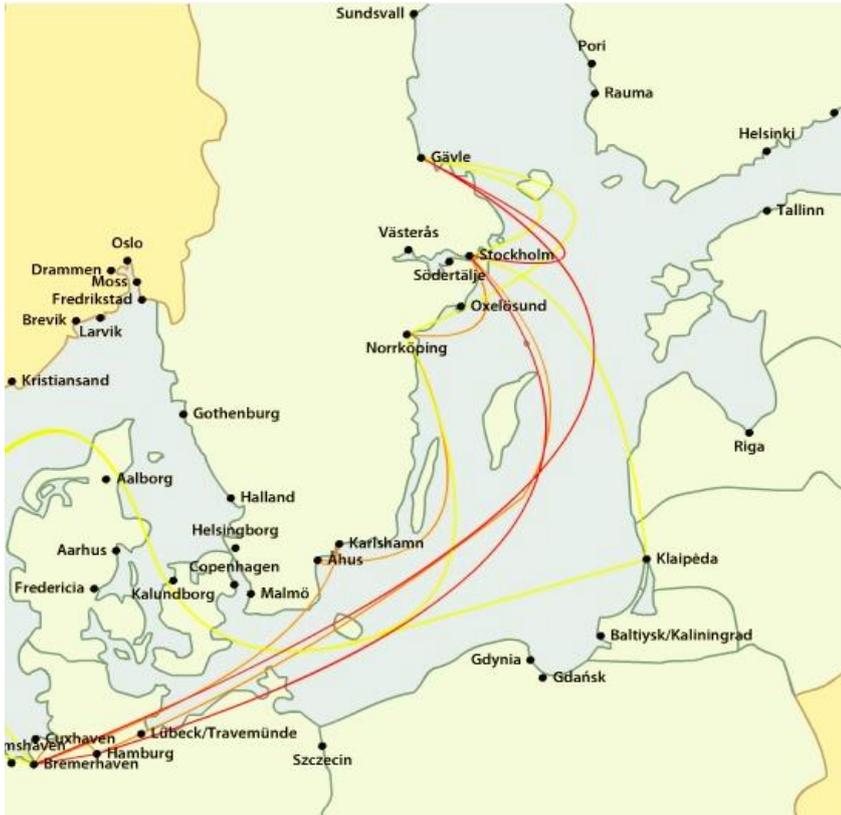
### Port of Stockholm ro-ro and ferry routes



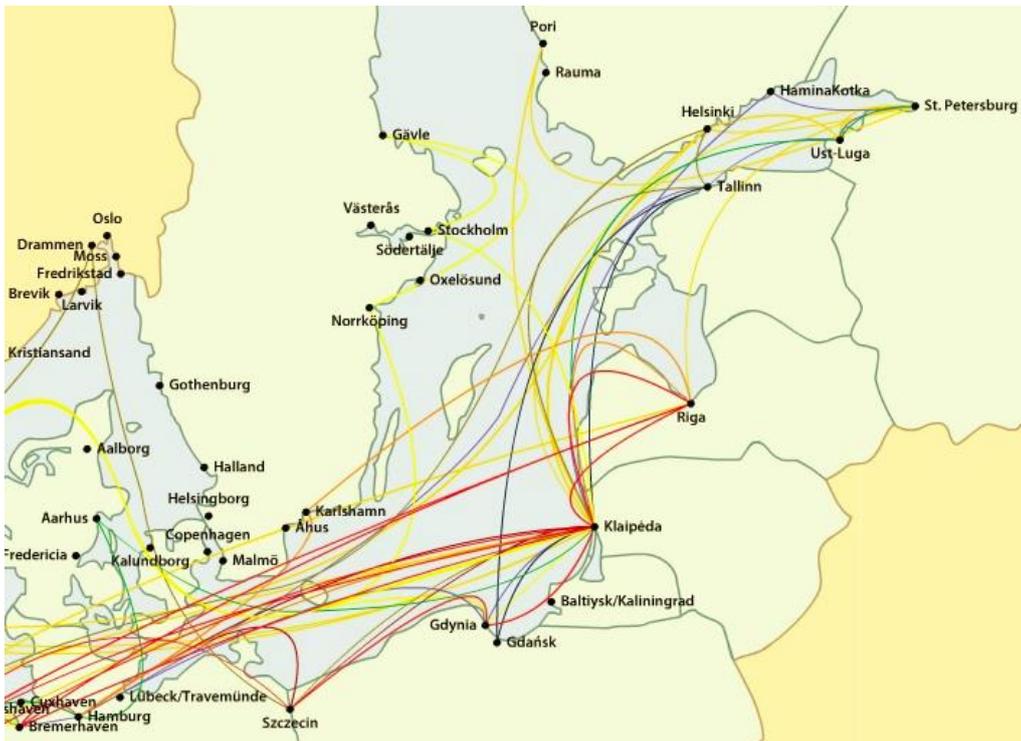
### Port of Klaipeda ro-ro and ferry routes



## Port of Stockholm container routes



## Port of Klaipėda container routes



## Appendix 2

Port of Stockholm terminals (Ports of Stockholm Annual Report, 2014)



**Appendix 3** Port of Klaipėda plan (Port of Klaipėda, 2015 [online] Available at: <http://www.portofklaipeda.lt/port-plan>) Accessed 10 June 2015)

