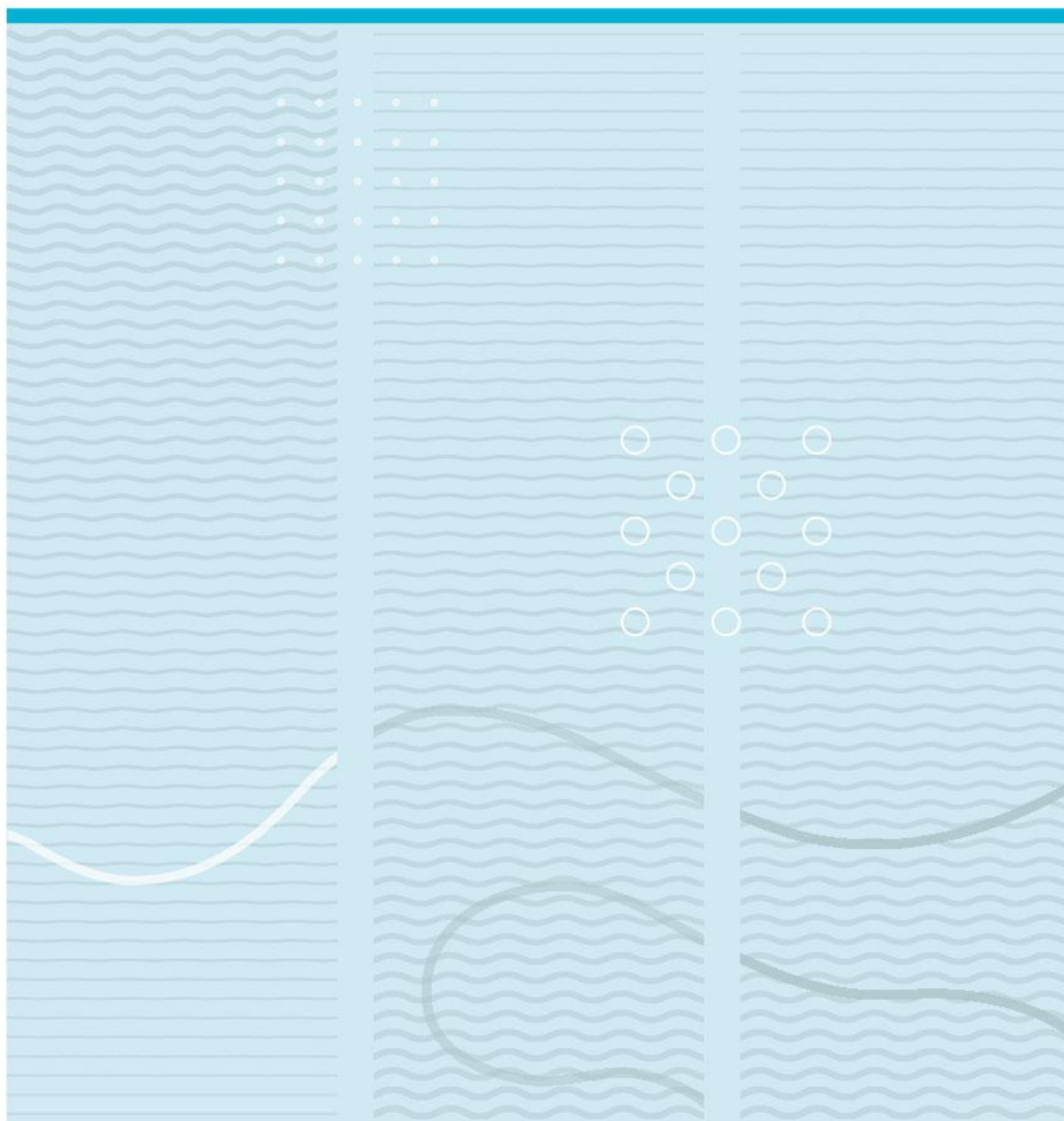


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# Ports contribution to sustainable business development



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This thesis is worth 30 study points

# Summary

Ports are a vital part of the supply chain. With their extensive knowledge and competence within logistics, infrastructure, transport, business development, sustainability and innovation, they can take a vital role in reaching the society's sustainability goal. By letting the port authorities participate and coordinate this commitment and transformation, becoming a more sustainable society, we may achieve several goals at the same time.

Interviewing several ports in the ØKS area, I was able to identify the challenges and possibilities for the port authorities going into the environmental and sustainable era. By taking a more active role in business development and closer collaboration with their owning municipalities, it is possible for them to act and be proactive to meet the demands from commercial companies.

Making business models that are up to date with the new environmental goals and expectations, building and facilitating networks and clusters herby sharing knowledge between the port actors and helping businesses to see new possibilities within the "new economy" is also important for the port authorities to succeed.

By attracting more sustainable business to or close to the port, the flow of goods thru the port will increase, new businesses will emerge, increased rental income will occur and increased circular and symbiotic business solutions can be developed.

Keywords: Port, Sustainability, Circular Economy, Symbiosis, Port Governance, Network, Business Development

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Tønsberg, 01. June 2021

Bjørnar Thorsen

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# 1 Introduction

Ports are a vital part of the supply chain and sea transport counts for about 90% of the worlds transported cargo volumes (Sorgenfrei, 2018). Throughout the years, the ports have transformed from primarily loading and unloading goods to becoming a landlord, a host for support services and a regulator of transport in and out of the port. This thesis will focus on the ports role within business development and the future of the port as part of the climate goals ratified by the UN (2050 goal), EU (2030 and 2050 goals) and national goals.

Working with ports and port related issues as a Project manager for several EU and national projects at The University of South-Eastern Norway (USN) I have obtained a great deal of knowledge and interest about the ports current situation and for the national and international requirements that are imposed on this sector. There are interesting possibilities for the future port that have yet to be uncovered, especially taking into account the circular economy (CE) and the symbiotic approach to business development. This opens up a possibility for the ports, being able to increase the goods flow, contributing to more green and sustainable transport and to circular and symbiotic business development in or near the ports. The lack of research related to the ports role in sustainable business development is a clear indication that this is an overlooked field of research.

As the ports have developed thru the years, they now take a more active and leading role regarding the green and sustainable transformation within the transport chain. Their reach goes further than the gates and the quay of the port. Recent years the ports have focused on electrification, sustainability and green shift. Some examples of the ports social and environmental responsibility is; implementing green ship indexes for the ships calling on their port, electrification of the port and port equipment, installing cold iron, use of environmental friendly trucks for logistics company's entering the port area and even offering financial incentives to ships using slow steaming from last port (Port of Long Beach).

This show us that the ports are taking a larger responsibility reaching out of the physical port setting requirements for port users to become more sustainable and environmentally friendly, either by demanding the port users or offering financial incentives for being environmental friendly.

In this context, the thesis will investigate the possibilities, drivers and barriers that arise from the ports new position in the supply chain, with focus on the ports potential in sustainable business development.

The objective of my research is to identify the barriers and drivers for sustainable port development and how ports can participate in sustainable business development.

As the ports aim to contribute to a more environmentally friendly transport by shipping more goods by sea, it is interesting to study their relationship with its owners and stakeholders, and the communication between them. This is especially interesting given the opportunity the port have for attracting new businesses and connecting them to the port or in close proximity to the port. There are today several “industrial” ports in Norway that has experience with attracting new businesses to the port. In addition to these port’s we are also seeing ports that have shortage of land/area, establishing dryport’s or inland ports to give their existing and new customers a possibility to collaborate and use the port as a main vendor of transport services. It is therefore also of interest to look at the business model theory for ports today and try to identify how the new business opportunities can be implemented in new business models and thereby a new way to think and act for the ports in the future.

To understand how ports can participate in sustainable business development and to identify the barriers and drivers for sustainable port development, I focused on port related theory within: business model, governance, circular economy, networking and business development.

Three of the ports interviewed for this thesis have outsourced its port operations to private companies, one handles all of its port functions. During the focus group interviews, the respondent was not specific when talking about the port. Therefore, it is important to remember that ports cargo handling in three of our ports are done by private operators (PO), that has concessions given by the port authority (PA). It might be challenging to distinguish between these roles from the interviews and the literature but the PA’s do also have some co-determination over the operators, for instance regarding environmental and sustainable port adjustments and establishing and shutting down shipping routes to the port. I have therefore tried to distinguish between the PO, PA and the port in general when this is possible. The nature of focused group interviews facilitates the free development of the discussions and this would be restricted by too many interruptions.

Theory also refers to a port development company(PDC). This role is mainly handled by the PA for our ports.

## **2 Literature Review**

According to theory there are 4 types of basic port management models commonly used today, namely Public Service port, Tool Port, Landlord Port and Private service port.



Type	Infrastructure	Superstructure	Port labour	Other functions
Public service port	Public	Public	Public	Majority public
Tool port	Public	Public	Private	Public/private
Landlord port	Public	Private	Private	Public/private
Private service port	Private	Private	Private	Majority private

Table 1: Basic port management models. (Sorgenfrei, J., 2018)

The criteria's for the 4 types of port management.

***Public service ports:***

Here the superstructure and infrastructure operation and planning is handled by the state

The port is managed like a public department

There is no private port operations.

Typical for smaller ports.

***Tool Port:***

An independent public body is responsible for the port

Independent from other ministries

Small private operators

Often a mix between municipal and state management

***Landlord Ports:***

The municipal government is responsible for the infrastructure

Superstructure is private (financing and planning)

Public port authority and private terminal operators

Private and public power is balanced

The main organizational structure for ports in North Europe.

***Private ports:***

Both super- and infrastructure is in the hand of private companys

No or limited public influence (e.g., for financing, planning)

Usually not universal ports

Often work ports with focus on one product.

The focus for this thesis will be on Landlord ports, since this is the dominant model in the north of Europe and the investigated ports in this thesis. It is also the type of port that has the potential for contributing to sustainability, sustainable business development and circular economy (De Langen 2020)

De Langen et.al.(2020) argues that In most ports, an autonomous but government-owned port development company (PDC) is responsible for port development. While such a publicly owned company operates commercially, it is generally not oriented towards maximizing profit but towards creating value for society. In addition to the commercial reason of attracting circular economy (CE) as it provides growth opportunities, government ownership of a PDC may increase the focus on attracting sustainable activities to the port complex. Especially taken under consideration that ports are under pressure from stakeholders to mitigate the social, economic and ecological harms caused by the commercial, tourist and industrial activities localized in the port. Although the advances in the understanding of the role and business model of the PDC, the role of the PDC in transitioning the port towards a circular model has not received detailed attention (Kringelum 2019, 2017).

In most ports, an autonomous but government-owned PDC aimed at financial sustainability and creating broader societal value is responsible for port development. The central concept in assessing the role and business model of the port development company is the concept of the port as a business ecosystem (Van der Lugt et.al. 2018). This supports various studies that also analyze circular economic activities with a business ecosystem perspective. The main strategy supported by Iansiti and Levien (2004) is in line with the strategies developed by many port development companies (Van der Lugt, et.al. 2015).

PDC's increasingly operate with a landlord business model, i.e., they attract third parties to their port ecosystem. Port reform in various countries has led to a shift from operating ports, in which the PDC provides port operations in-house, a dominated strategy, as stated by Iansiti and Levien (2004). Most PDC's still remain state-owned.

By operating a land lease model, the PDC leaves a considerable part of the port operations in the port ecosystem to third parties and directs their attentions to improving the quality of the port as a platform. In contrast, many of those PDCs that traditionally operated as landlords have moved away from a passive role, were they focused mainly on providing port infrastructure such as quays and basins according to Iansiti and Levien (2004). Gradually, PDCs develop a more active role, which is described with different labels such as cluster manager (De Langen, 2004), matchmaker or

orchestrator (Verhoeven, 2010), and is in line with the keystone strategy. In this strategy, PDCs develop tools and services to make the port as a whole, more productive and competitive.

Ports are special compared to other ecosystems in the sense that the ecosystem developer is often state-owned. As for the developing body of knowledge on state owned enterprises (SOE), a state-owned PDC is expected to behave differently from a private PDC. There are two differences that are relevant in the context of a keystone strategy (Van der Lugt, 2018). First, the state-owned PDC is expected to have a higher dedication than a private PDC to investments in the ecosystem with benefits that are partly external to the PDC ,i.e., that cannot be fully captured by the PDC. Second, the state-owned PDC is expected to have a higher commitment to reducing negative externalities and creating positive externalities, especially in training, education and R&D, than a private PDC. The state ownership is relevant for the firms located in the port business ecosystem as risks of niche firms in the ecosystems are partly related to exogenous developments but also partly to the actions of the core firm in the ecosystem (Teece, 2007).

## 2.1 What is a Port

The World Bank Port Reform Toolkit states that, “Ports usually have a governing body referred to as the port authority, port management, or port administration. Port authority is used widely to indicate any of these three terms.” The term port authority has been defined in various ways. In 1977, a European Union (EU) commission defined a port authority as a ‘State, Municipal, public, or private body, which is largely responsible for the tasks of construction, administration and sometimes the operation of port facilities and, in certain circumstances, for security.” This definition is broad enough to include the various port management models today within the EU and elsewhere.”(Port Reform Toolkit, 2007, p 77.) The term “authority” implies a specific form of public management, often associated with characteristics like “bureaucracy” or “inefficient.” The word “authority” is to be understood as the generic term for the body with statutory responsibilities in managing the whole port, either private or public.

Ports authorities worldwide are established at all levels of government, either provincial, regional, national, or local/municipal. Most common is the local port authority, overseeing only one port area.

A report made in 2011 by the European Sea Port Organization (ESPO) (Verhoeven 2011, p.16) summarizes four basic functions that port authorities can have:

- Landlord
- Regulator

- Operator
- Community Manager

The landlord role can be considered the main function in this context. Most of the port authorities have been given the legal rights to lease or rent real estate and/ or specific infrastructure like terminals and quay walls to interested parties, even though port authorities do not own the land within their jurisdiction. The other three port functions have changed significantly in recent years, with increased private interests in port business. Especially the function as operator that almost has ceased to exist.

In addition to the basic functions above, Verhoeven (2011) claims that there are three basic types of port authorities, according to their business behavior and self-image:

- Conservator
- Facilitator
- Entrepreneur

A *conservator* port concentrates on continuity and maintenance sticking to a mechanistic and passive implementation of the three traditional port authority functions at local level. Because of this low-profile attitude conservator, the port may become marginalized and even extinct.

A *facilitator* port profiles itself as a matchmaker and mediator between economic and societal interests, hence the well-developed community manager function. Facilitator port authorities look beyond the port perimeter and try to engage in strategic regional partnerships. It is the type of port which that seems to find most support in literature for the fine balance it represents.

The *entrepreneur* port combines the main features of the facilitator with a more outspoken commercial attitude as investor, consultant and service provider on all three geographical levels. Because of this ambitious profile, it is also the type of port which runs the highest risk to encounter problems caused by conflicts between the various functional levels. (Verhoeven, 2011)

For the overall performance of ports, ESPO differentiates between four essential factors in total, two of them (1 and 2) being formal factors and two (3 and 4) informal factors (Verhoeven, 2011):

- 1 Legal and statutory framework
- 2 Financial capability
- 3 Balance of power with government
- 4 Management culture

The two formal factors consist of the financial capability on the one hand and the legal and statutory framework on the other. The informal factors is related to the balance of power with government and the management culture that dominates within the PA. These four factors are strongly interrelated. The power balance with government will have effect on the financial capability and the legal and statutory framework of the port authority and determine the space its management has to pursue and stimulate a pro-active culture.

There is a new interest in the role of port authorities and their repositioning and development of new strategies. Port authorities must keep up with the pace of change and often focuses on the essential question whether the role of port management should be restricted to enforcing regulation or more actively participate as a market player.

Verhoeven, (2011) have developed a framework to identify the different functions of the port authorities called *hypothetical typology of port authorities*.

All four factors are highly inter-related, but Table 2 shows the space between these for different activities and functions. The description of the three types of business behaviors clearly indicates that there is considerably room for port authorities to facilitate port business and trade, in addition to be engaged in own business development. The bottom line in Table 1 labeled “geographical dimension” expresses that the more proactive authorities are, the more likely they extend their business beyond their own perimeters and are active on global, national or regional levels. Port authorities with success show that there is no contradiction in being active globally and still fulfilling a role as community partner. Yet possible, global activities of port authorities are very rare and most ports focus on their core functions.

Which of the four functions a PA will focus on is up to the shareholders, being a municipal administration, the ministry, another institutional body, or a mix of all. The board of shareholders is the port’s principal steering body and the ownership in all these cases is a public one. In addition to the owners (shareholders), port authorities can sometimes include stakeholder groups as members of their supervising and/or steering committees. This is done to include the interests of these various groups into the regional port business.

<b>FUNCTION</b>	<b>TYPE</b>	<b>‘Conservator’</b>	<b>‘Facilitator’</b>	<b>‘Entrepreneur’</b>
<b>Landlord</b>		<p>Passive real estate ‘manager’:</p> <ul style="list-style-type: none"> <li>- continuity and maintenance</li> <li>- development mainly left to others (government / private sector)</li> <li>- financial revenue from real estate on “tariff” basis</li> </ul>	<p>Active real estate ‘broker’:</p> <ul style="list-style-type: none"> <li>- continuity, maintenance and improvement</li> <li>- development broker and co-investor</li> <li>- includes urban and environmental real estate brokerage</li> <li>- financial revenue from real estate on commercial basis</li> </ul> <p>Mediator in commercial B2B relations between service providers and port customers</p> <p>Strategic partnerships with inland ports, dry ports and other seaports</p>	<p>Active real estate ‘developer’:</p> <ul style="list-style-type: none"> <li>- continuity, maintenance and improvement</li> <li>- direct investor</li> <li>- includes urban and environmental real estate development</li> <li>- financial revenue from real estate on commercial basis</li> <li>- financial revenue from non-core activities</li> </ul> <p>Direct commercial B2B negotiations with port customers – active pursuit of market niches</p> <p>Direct investments in inland ports, dry ports and other seaports</p>
<b>Regulator</b>		<p>Passive application and enforcement of rules and regulations mainly set by other agencies</p> <p>Financial revenue from regulator role on ‘tariff’ basis</p>	<p>Active application and enforcement of rules and regulations through co-operation with local, regional and national regulatory agencies + setting of own rules and regulations</p> <p>Provide assistance to port community to comply with rules and regulations</p> <p>Financial revenue from regulator role on ‘tariff’ basis with differential charging options for sustainability</p>	<p>Idem facilitator</p> <p>Idem facilitator + selling expertise and tools outside the port</p> <p>Financial revenue from regulator role on commercial basis</p>
<b>Operator</b>		<p>Mechanistic application of concession policy (license-issuing window)</p>	<p>Dynamic use of concession policy, in combination with real estate broker role</p> <p>‘Leader in dissatisfaction’ as regards performance of private port services providers</p> <p>Provide services of general economic interest and specialised commercial services.</p>	<p>Dynamic use of concession policy, in combination with real estate development role</p> <p>Shareholder in private port service providers</p> <p>Provide services of general economic interest as well as commercial services.</p> <p>Provide services in other ports</p>
<b>Community Manager</b>		<p>Not actively developed</p>	<p>Economic dimension:</p> <ul style="list-style-type: none"> <li>- solve hinterland bottlenecks</li> <li>- provide training and education</li> <li>- provide IT services</li> <li>- promotion and marketing</li> <li>- lobbying</li> </ul>	<p>Idem facilitator type but economic dimension with more direct commercial involvement</p>
<b>GEOGRAPHICAL DIMENSION</b>		<b>Local</b>	<b>Local + Regional</b>	<b>Local + Regional + Global</b>

Table 2 : Hypothetical typology of port authorities (Verhoeven, 2011)

In many European ports, the shareholders appoint a kind of supervisory unit consisting of shareholders and/or stakeholders, which advice the port in its strategic and general tasks. This is not so common in the geographical area of this research (ØKS), where it is common for the board of directors to take the role of a supervisory committee and take general and strategic decisions in close cooperation with the owning municipality. The supervisory unit can decide about the organization and regulates the balance of power with the government. This means that as for a supervising body, the board of directors sets the framework for potential activities and disagrees or agrees about the basic function the authority should have, this means the board decides to what extent and how far possible facilitating and entrepreneurial responsibilities shall be or can be fulfilled by the authority. Sorgenfrei (2018)

Port authorities are confronted with the system-inherent challenge that they are considered local business development creators, which develop and facilitate businesses, enable tax revenues and create jobs. This means in most cases “developing maritime trade” or also shipping business. Port authorities shall support the local community and facilitate the local business by attracting (global) maritime trade. This is known as the port authority or PA-Paradox and means that the expectation is inconsistent with the performance potential.

All of these expectations are very high and unfortunately, unrealistic for the PAs to achieve. The real area of PA activity and the targets they can achieve differ very much from their stated goals.

<b>PA targets</b>	<b>Expect.*</b>	<b>Possib.*</b>	<b>Key Business Driver</b>
<b>- expressed in PA mission statements</b>	<b>“we want to do..”</b>	<b>“we can do..”</b>	<b>- who else can do</b>
increase port throughput/goods movement	+	-	Im- and Export-Industry
attract shipping lines	+	(-)	Terminal Operator
create jobs	+	(+)	Terminals, Port Industry
create tax income	+	(-)	Terminals, Port Industry
attract port industry / industrial cluster	+	-	regional economic environment/business climate
connect the country with the world	+	+/-	Shipping Lines
create a global hub	+	-	Shipping Lines, Forwarder, Hinterland Logistics Ind
stimulate economic development	+	(-)	Business climate (PA neg. influence)
increase global trade	+	-	Im- and Export-Industry

\* Expect.=Expectations; Possib.=Possibilities; with: + = yes (+) = partly yes +/- = indifferent (-) = nearly no - = no

Table 3: The PA-Paradox (Sorenfrei, 2018)

## 2.2 The Port Authority's Objectives

The main objective for a port authority is to exercise jurisdiction over a port territory and provide and develop the necessary infrastructure of this functional and economic unit. The legal basis for this unit's existence is often an own port law that states the legal status for the authority. For nearly all ports, their objectives are aligned with the macroeconomic goals of the nation and the business needs of their region, this can be creating jobs or to strengthen the local economy, etc., even though the authority itself has limited options to achieve these goals. What needs to be evaluated is a more exact set of objectives for a typical PA that is necessary to develop and provide the infrastructure, without falling into the trap of the PA-Paradox.

A PA's duties and powers regarding land management are regulated according to port law. The laws governing ownership and use of port land should be given special attention.

It may own the land or have a time-specific or perpetual right to use the land. Powers to act as a landlord should be specifically elaborated, and also the limitations of such powers, such as the prohibition of the sale of port land. While the authority is engaged in, or provides for, building operational infrastructure, the maintenance of such infrastructure constitutes a responsibility for the authority (Sorgenfrei, 2018).

A key role for most PA's is as an administrator or "passive manager" and they are responsible for managing the real estate within the port area. This management includes long-term development, economic exploitation, and the maintenance of basic port infrastructure, such as fairways, access roads, berths, and tunnels.

As a public body, the PA is responsible for observance of laws and conventions regarding public safety and security, navigation, environment and health care. Port authorities can also issue port bylaws, including many regulations and rules with respect to the use of port areas, behavior of vessels in port and other issues. Often, extensive police powers can also be assigned to the PA.

Acting as port planner in coordination and close cooperation with the local and regional government is complicated, especially for large ports located within or near a city. Sorgenfrei lists up four considerations for a port planner to consider (2018):

1. The consistency of plans with the general terms of land use that have been set by the competent authority.
2. The total set of interconnected port-city relations that exist; ports are often important parts of regional and city development plans.



3. The impact of port development proposals on the immediate surroundings (traffic, environment, roads and facilities).
4. The appropriateness of port development proposals in the context of regional, national and international port competition.

PA objectives are the end points intended for proposed projects or tasks. Objectives are not performed or carried out and they do not produce results or data. These descriptions apply to the domain of “tasks”. Tasks in a PA’s work (or research) plan are steps taken to achieve the stated objectives. The task list that port authorities carry out is long and varies with the different niches the ports are operating in. This means that not every ports are concentrated on all the tasks.

Port authorities are active on a local level, but a cost-effective and competitive port business is also of huge interest for the government. This is because ports are a key facilitator of trade for their hinterland, the export and import policy, foreign trade policy and they are important for nations as well as for international organizations, like the United Nations (UN). High port costs due to ineffectiveness have an economic impact much like a generalized import duty that will result in increased costs for all imported goods and also reducing the competitiveness for exports. By decreasing port costs, the result will be increased trade and competitiveness. That is why the public is interested in having ports working at competitive and reasonable costs in addition to operating cargo and transportation equipment safely, and with minimal environmental impact.

In nearly every countries around the world there is a strong public interest in ensuring that ports operate safely and efficiently, that fair and competitive services are provided, preventing oligopolistic or monopolistic tendencies in pricing with unjustified “economic rents” and that ports foster and support economic development (trade) nationally and locally. Public interest in ports comes from their vital role as gateways to economic commerce and trade. Typically, the Ministry of Transport makes a variety of port regulation and policy functions at the national level, ensuring that the port system supports economic interests. (Sorgenfrei 2018)

## **2.3 Business Models and Networks**

The importance of the strategic role of port authorities in developing port supply chains has been gradually increased since the turn of the century. (Kringelum, 2019) This change of roles for port authorities (Verhoeven, 2010) related to the increased competition between port supply chains has provided many options for reconsidering the existing business models of port authorities (Kringelum, 2017).

Views of strategic management has gradually been applied in studies concerning port authorities and ports.

Value creation in a port system is a complex processes and the concept of business models and business model innovation is fairly new to ports (Parola et al., 2017; De Martino et al., 2015). The definition of a business model can be outlined as representing a company's strategic and core logic choices of value creation and capture which occur within a value network (Shafer et al., 2005). The business model often used by port authorities has been regarded as evolving along a continuum of the PA roles, moving from a regulatory enforcer of policies to community managers and finally toward entrepreneurial facilitators (DeMartino et al., 2015). This evolving model indicates an important change in the business models of port authorities, which has currently been overlooked in port development literature. For port authorities to develop further than their traditional role as landlords, the value creation in the port needs to be reconsidered. This might require new managerial practices and logics in addition to committing in partnerships to co-create value with stakeholders in the port. The rethinking of value creation can really create a policy for innovating existing PA business models (Hollen, 2015)

The existing business model and activities of a PA must still apply and be integrated with new capabilities, resources and possibilities at hand. When exploring future development vs exploiting the operational present, it is important to explore how existing challenges emphasized in port development, effect the future and existing business models of port authorities (Kringelum 2019).

Kringelum (2019) points to four current business model challenges of port authorities:

1. diversification of port customers
2. requirements for new value creation
3. changing possibilities and constraints of value capture
4. network effects, clusters and strategic partnerships.

Verhoeven (2010, p.251) defines a port authority as: "A port authority can be defined as the entity, which whether or not in conjunction with other activities, has as its objective under national law or regulation, the administration and management of the port infrastructures, and the co-ordination and control of the activities of the different operators present in the port". This definition emphasizes the interdependence between the port authority and the private firms within and beyond the port perimeter (van der Lugt et al., 2013).

The idea of ports as spatial sites for interfirm networking that can enhance the links of companies in a supply chain through supply chain management is widely accepted concept in research (De

Martino and Morvillo, 2008; Bichou and Gray, 2004), as ports consist of independent yet interdependent firms (de Langen and Haezendonck, 2012). This is why the performance of a port is dependent on the coordination of company's within the port. According to Meersman et al., 2010, the competition between ports has changed to competition between supply chains and the competitiveness of these different supplychains defines the success of ports in general.

Building relationships between company's to increase the competitiveness of a port can be difficult for port authorities because of the low degree of trust between port actors and the risk of opportunism that exists within the port system (De Martino and Morvillo, 2008; De Martino et al., 2015). Nevertheless, the collective achievement by firms in a port system can benefit both the competitive advantage of the firms involved as well as the performance of the port. De Langen (2002) argues that this is why the PA must take on a new role as cluster or community manager. When investing in port clusters, we see that the motivation for port authorities is the potential for generating new income (de Langen and Haezendonck, 2012). Facilitating port clusters will place a wide range of new demands on the organizational capabilities of the port to guarantee value creation in addition to the competitiveness of the port in general (De Martino et al., 2015).

Port authorities have traditionally been public companies owned by municipalities or states with a strong focus on being self-sustaining rather than maximizing profit. Increased competition with other ports and other forms of transportation in addition to new environmental conditions, have created incentives for reevaluating and reorganizing the governance organization of ports and the role of port authorities (de Langen and van der Lugt, 2017). Current research emphasizes on the commercial role undertaken by PA's (de Langen and van der Lugt, 2017) and indicates a need for new governance mechanisms in the port system that has emerged for the organization of PA's, so they can ensure proactivity and a wider strategic scope (Parola et al., 2017).

If PA's are to extend the strategic scope and become more proactive, new types of value creation and capture must develop together with the traditional port activities of being a landlord, regulator and operator. This value creation depends on the inter-organizational relations present in the port system because the PA must become a facilitator for joint strategic intent (Cahoon et al., 2013). To create value for port customers, PA's must increasingly add to the traditional physical resources of the port with knowledge-based resources such as networking, relational capabilities, human capital and IT infrastructure to create core competencies and economies of scope (De Martino et al., 2013;Notteboom and Winkelmanns, 2001). It is more and more accepted that port authorities must

develop capacity to stay innovative within the regional system (Cahoon et al., 2013). Hollen (2015) states that this change in port authority roles as becoming a versatile port authority, requiring a focus on handling the existing activities in addition to the development of new ones. Handling new roles and activities places new expectations on the PA as an organization as well as on its vision, corporate culture and strategy (Dooms and Farrell, 2017).

The need for new value creation requires PA's to reevaluate the fundamental value concept stated in the business model. By adjusting the existing value proposal or creating innovation based on exploring new value proposals, PA's must then reconfigure both the key resources and key activities of the present business models (Kringelum, 2019).

The change of expectations related to value creation has caused a change of value proposals offered to the customers by the PA. This has again affected the potential for capturing value. According to Robinson (2002, p.241), "The port captures value for itself and for the chain in which it is embedded." The more proactive role the PA takes, the wider the scope of value creation and accordingly potential value capture. This involves sustainability (Hollen, 2015), regional development (Cahoon et al., 2013), financial objectives of revenue generation (van der Lugt et al., 2013) and intermodal connectivity (Van den Berg et al., 2012). In addition, the port authorities are gradually expected to become financially self-sustaining (Dooms et al., 2013).

To achieve this goal, activities focused on cost-efficiency and exploitation have gotten priority in the development of PA's together with the search for new activities that can generate revenue. As a result, the potential value to be captured and the need for value capture is changing for PA's. (Kringelum, 2019)

The traditional method of measuring cargo volume and revenue streams of port tariffs is of lesser interest when compared to value capture measured by regional growth for the public interest in terms of employment (van der Lugt et al., 2013) or the ability to attract and manage private initiatives (Parola et al., 2017). The value capture must balance between social utility and private profitability (de Langen and van der Lugt, 2017; De Martino et al., 2013) as PA's increasingly manage spatial, societal and operational issues (Verhoeven, 2010). This means that PA's must balance the need to capture economic value and at the same time maintain a focus on both environmental and socio-economical value.

Van der Lugt et al. (2013) describes the challenging role of PA's and defines them as a shared value hybrid organization with both private and public characteristics. Due to this interaction of private

and public roles, the cost of large investments within the port are often paid for by PA's, as private firms are unwilling to cover the losses relating to the years of establishment (Van den Berg et al., 2012). Therefore, PA's often experience an unequal division of costs in relation to the port users (Notteboom and Winkelmanns, 2001). This challenge of value capture is influenced by the choice of governance structures in PA's, which is dependent on the governmental relations and financial autonomy, both nationally and locally (Brooks and Pallis, 2008; Verhoeven and Vanoutrive, 2012). Pursuing new possibilities of value creation, PA's must gradually manage both the new possibilities of generating revenue streams and the existing limits of value to be captured due to the current cost structures.

## **2.4 Port Competition and Cooperation**

The maritime sector is becoming more global and this affects the development of PA's, as port competition is global. That is why inter-port collaboration across national boundaries or in close proximity is becoming more widespread, and as a result reflecting new approaches to co-opetition in the sector (Dooms et al., 2013). Inter-port collaboration can for instance take place by starting feeder-and-hub port relation (Low et al., 2009), that can increase connectivity and thus potential growth.

Port competition has shifted from competition between ports, toward competition between supply chains with the port as a vital part. Therefore, the focus on strategic alliances with private firms has increased significantly, creating new opportunities and challenges for port management. In 1998, Suykens and Van de Voorde (1998) questioned if it was in the interest of PA's to support development of alliances, and if PA's should cooperate in alliances within the supply chain. They concluded that PA's seldom were involved in these alliances but now we see that this trend has changed. PA's are becoming more proactive in the management and formation of port clusters. The changed expectations for value creation by PA's is affecting the previously role taken by PA's, as it requires them to move from an isolated position at the center of the port system to a more vulnerable position based on an increased degree of interdependence with other port actors (Verhoeven, 2010)

Ports can be regarded as clusters of economic activity with various degrees of agglomeration (De Langen, 2004), and the establishment of obvious port clusters is increasingly affecting the competitiveness of ports and thus PA's (van der Lugt et al., 2013). PA's are gradually accepting this new way of organizing within the port system. PA's can be an active part of such clusters through the port supply chain integration, and according to Stevens and Vis (2016, p.262), it can be defined

as: “The extent to which a PA plans, organizes, and coordinates activities, processes, and procedures related to physical, information, and financial flows beyond its own gates along the supply chain and monitors performance in such activities to induce horizontal and vertical integration”

This requires the PA to use the knowledge integrated in the companies within the port and identifying interdependencies and overlaps within and between different supply chains (De Martino and Morvillo, 2008). By doing this, PA’s can take on a leading role in establishing networks, clusters and other forms of inter-organizational collaborations (De Martino et al., 2015). By taking this leading role, the port needs well defined relational abilities and new core competencies in the PA’s organization. (De Martino and Morvillo, 2008).

Another way of organizing the supply chains within a port is for PA’s to establish port public-private partnerships (PPP). PPP is defined by Panayides et al. (2015, p111) as:

“Co-operation between private and public actors with a durable character in which actors develop mutual products and/or services and in which costs, risk, and benefits are shared and mutual added value is created”

This approach to port development requires creating stronger interdependence between firms in the port, with the PA taking a proactive role as part of the development processes. This approach refers back to the hybridization of PA’s and the challenges of balancing private and public interest within the port, that is vital when it comes to the changing governance structures founded in the political impact of ports.(Kringelum, 2019)

Ports play a major role in the value networks across port perimeters and should not be regarded as an isolated organizational entity. However, the PA’s must increasingly consider the possible networks effects from new initiatives and the potentials of reconfiguring the organizational boundaries by creating strategic partnerships and port clusters. Analysis of existing challenges affecting the business models of PA’s reveals a rapidly changing competitive landscape affected by the macro level influences in the industry, that impact all actors within port systems.

Kringelum 2019 states that managing the effects of the changing competitive environment places great responsibility on the PA’s and creating a need to start new activities that require new competencies and resources within the PA organization (Kringelum, 2019).

## 2.5 Business Development

De Langen 2020, emphasises that there are 5 requirements for a successful business development by a PDC.

1. “Leadership status” in the port community

This allows the PDC to take risks and initiatives. Such leadership capability is not a given and needs to be developed carefully. One of the challenge, similar for any company that develops an economic ecosystem, is to avoid a “dominator” attitude. Dominators focus on capturing value, instead of creating value. That is why dominators do not share value with others as their organizational DNA. This goes at the expense of a leadership status as central organization in developing an economic ecosystem (in this case a port complex). Another challenge, specifically for government-owned PDCs, is to distinguish leadership with authority. Leadership is earned; authority derives from power. A PDC cannot be successful in business development just based on power alone.

2. Deep insights in relevant industries.

Business development requires a deep understanding of the supply chains that ports create value and accommodate for. An understanding that goes beyond recognizing “increasing ship sizes” as a trend in port development and requires strategic interaction with major actors in relevant supply chains.

3. An organizational structure and culture in which committed teams can thrive and risk-taking is accepted. Business development is a joint team effort, and most certainly requires risk-taking. It is typical for government-owned organizations to stay away from risk-taking. As a consequence, business development is unlikely to be successful.

4. Ability to hold on to a long-term view.

This is highly relevant when business opportunities are not possible in the short run, there are delays and so on. Port development in ports usually involves considerable capital investments that cannot be reversed, and it also involves development and utilization of scarce port land. This means that decisions will have an impact for a long time. As a result an overall port development vision is needed to develop a well-functioning port complex.

5. The ability to get stakeholder support for port development initiatives.

Stakeholders, not the least national and regional governments, are very often heavily involved in ports given their economic importance and external effects. Therefore, government support is needed and in some cases they also need to be backed up with subsidies/ funding.

### 3 Methods

The aim of this chapter is to review how the process of this research has been conducted, what methods that were used and discuss the focus group (FG) as a method.

To understand the perspective of the ports relating to the thesis hypothesis, we need to investigate the relationship between the port, the stakeholders and the owners. In this search, it is important to understand how the cooperation between these parties (dynamics of their cooperation) work. The theme of the thesis has not been researched to much extent, and it is therefore a need to interview the persons working at the ports to obtain more information.

In addition to the FG interviews data was collected thru literature review and shorter unstructured interviews with 4 Norwegian ports within the Øresund, Kattegatt and Skagerak area (ØKS). All the ports are owned by one or more municipalities as IKS (Inter municipality company) or KS (municipality company), and all four ports are managed by public PA's.

The reason for this is that USN have several ongoing and previous research projects with ports in this area and therefore established substantially trust with these ports.

When choosing the method of research it was important to choose a method that also gave a description of the tacit knowledge the port have in relation to their interaction with the stakeholders and owners. The information flow and communication between these actors are done both formal and informal. Both the informal and the formal data collected will then be used to understand the practice and the possibility's a port have in regards to archiving and participating in developing the local and regional businesses in a sustainable context.

In contrast to a quantitative research method we have, by using the focus group method, been able to see and understand in depth the barriers and drivers for the ports with regards to the hypothesis of the thesis.

The group participants consisted of academic peers and one or two representatives from the ports for each FG. As the ports are in competition with each other, it was important to keep them in separate FG interviews. Mainly because they could open up more in the sessions but also to respect and not reveal their competitive and business strategy to competing ports.

Questions and probe questions/words were put into an interview guide that was used for all FG interviews. The sessions were recorded with consent from all participants. Several of the interviews were longer than expected and what the theory recommends. The reason for this may be that there was a high degree of knowledge among the participants, related to the theme discussed in the FG.



Many of the questions and answers were in depth or was explained in depth as a result of the level of knowledge among the participants.

The focus group interviews was conducted over a period of 5 months. This resulted in a abductive approach to my research. The information gathered early on formed my approach to the last focus group interviews. As stated by Dubois and Gade (2002), what was regarded as a problem in the first interviews was more recognized as an opportunity when conducting the last focus group interviews. The information I gathered from the first interviews shaped some of the my later interviews. According to Dubois and Gade (2002) this should be considered a strength rather than a weakness. I was more enlightened by the first interviews and consequently the concept of sustainable port development evolved during the 4 focus group interviews, making my interviews not only a product but also a tool (Dubois and Gade, 2002).

### **3.1 Benefits by Using Focus Group**

A focus group is primarily an organized discussion between a chosen group of individuals with the purpose of collecting information about their views. The aim is to obtain a range of views about the subjects and situations that is important for answering the research question of the thesis.

The method is quite similar to group interviewing but has some differences. Group interviews consists of a number of people that are all interviewed at the same time. However, in FGs the goal is to create interactions and discussions within the group. By providing a 'safe' environment, FGs intend to endorse self-disclosure among participants, by generating group dynamics within discussions (Freeman, 2006). Within the qualitative research, FGs is located between naturalistic observation and individual interviews (Seal et al., 1998). I also used unstructured interviews and literature review to obtain data for this thesis. This can be identified as using a mixed method and the reason for adding to the FG method is the possibility to clarify and obtain more information on one or more subjects that was revealed during the FG interviews and thereby strengthening the quality of the collected data.

One of the strengths of using FGs is the flexibility for shedding light on almost any issue or topic. (Stewart et al., 2007). If you compare it to large-scale surveys, FGs can be made relatively quick and inexpensively in addition to provide data that researchers can analyze virtually immediately after the FG session has ended. The method provided me with the possibility for clarification of responses, for posing additional probing questions that was prapered in advance and for the observation of non-verbal responses. (Stewart et al., 2007). Data was collected by allowing the

participants supplement to the views expressed by other group members. A research study by Seal et al. (1998) suggested that interviews may be a good way to identify the variety and complexity of individual values and beliefs, but group settings in FGs may be better at creating discussion around shared and unshared attitudes and experiences. This was confirmed in all my FG interviews.

According to Krueger (1994) the method of FGs can be used at the exploratory stage of a study. In the FGs that was conducted, we saw that this was the case when some of the themes or limitations of a subject was unknown or unclear, but also when the key constructs for the study needed to be identified. Specifically in this case, when a greater understanding was needed to understand the interaction between the port, the stakeholders and port owners.

By using FGs, we achieved what Lindlof and Taylor (2002) call a chain or cascade effect. This is obtained by listening to other people's memories and experiences and will trigger new ideas for other participants. This is especially the case where participants understand that they share a common experience, and they feel that their views are validated and supported by others. In our case when other peers and participants follow up on information disclosed by the ports. Above all, FGs help to clarify differences and similarities between the values and opinions held by participants (Freeman, 2006).

## **3.2 Focus Groups Method Limitations**

The choice of research method will always impose limitations.

One of the limitations of using FG is the fact that the moderator have less influence or control over outcomes and processes, in contrast to the data being collected through an interview (Morgan, 1997). This is also the case for some of our FG's where the discussions, conversations and arguments sometimes got "off track". The challenge when intervening using probe words or questions was the risk of counteracting the purpose of the exercise, namely for the participants to speak freely. In our FGs there were no group members that dominated the discussions or spoke very little. This was mainly because there was only one or two representatives from the ports in each FG. This was deliberately due to the challenges for involving different ports in to the same FGs thereby challenging disclosure of sensitive information to competitive ports.

This is supported by Kitzinger (1995), who points out that a FGs is not an optimal approach when it is vital to maintain confidentiality, since the participants views are expressed in a group environment. Kitzinger (1994) also emphasizes that another downsides of group dynamics is that the group may censor deviations from group norms or standards

When it comes to generalizability of the results, a disadvantage is that FGs are often made of convenience samples, limiting the generalizability of the results.

<b>Strengths</b>	<b>Weakness</b>
Affords the opportunity to identify collective perspectives	Potential for breach of confidentiality
Discussion in the group allows for validation of ideas and concepts	Conflicts may arise in the group that are difficult to manage
Allows access to culturally and linguistically diverse groups	Success is dependent on the skills and experience of the moderator
Allows access to wide range of participants	Complexity of monitoring verbal and nonverbal responses of participants
Can become a catalyst for change both during and after the focus group	

Table 4. Summary of the strengths and weaknesses of using focus groups. (Halcomb et al., 2007)

It may be difficult to plan the variety of a group. A highly diverse group might reveal a wide range of viewpoints, but only if participants are sufficiently confident and relaxed to speak in each other's presence. A highly heterogeneous group, like in our case, bonded well and produced valuable contributions from all members, although some responses were somewhat repetitive but from different angles.

MacIntosh (1981) states that the optimal size for a FG should be between six and eight participants, with sessions lasting between one and two hours, while Krueger (1994) recommends between six and 12 members. In our case, we have chosen a somewhat smaller size. This because the participants (the Ports) are in a competitive situation and would most likely be more reluctant to reveal too much information to each other and instead we contributed with academics that have waste knowledge of the topics and knowledge discussed and are considered peers by the ports.

Speaking in public and especially on subjects where there are polarized viewpoints, may make people reluctant to speak. In that case probing questions or words can be used. For our FGs this was used occasionally to get the participants back on track on the theme in question

Research design contains an overall plan for the measurement, collection and analysis of data. A research design could contain the use of only one FG. But one of the purposes of qualitative research is to achieve a degree of data saturation, meaning a point where the last FG does not provide or give more possibilities for new knowledge (Flick, 2009). Data saturation gives credibility to the research, therefore it is common to use at least three or four FGs as part of a

research design. This can also include other data collected as a mixed method. I experienced this in my data collection, in addition to the mixed method (FGs, Literature review and unstructured interviews) I conclude that four FG sessions, literature review and follow up with a few unstructured interviews were enough to obtain data saturation in my case.

### **3.3 Focus Group Epistemology**

In addition to the three epistemological positions stated by Sayre (2001), Freeman (2006) discusses a fourth – a ‘realist’ approach. Qualitative researchers who favor realism, seek to represent reality (Hammersley, 1992) and analyze data to discover pre-existent categories and consistency of meaning. There may be a concern for producing convincing evidence of validity and reliability, so that the findings can be considered true.

Exploring the impact of epistemological positions on FGs, Freeman (2006) takes the work of Krueger (1994) to highlight a realist position and Kitzinger (1995) who takes a constructionist stance to illustrate four areas of interest, namely, group membership and sampling, homogeneity and heterogeneity in group composition, interaction within groups and generalizability of results.

#### **3.3.1 Heterogeneity and Homogeneity in Focus Groups**

Krueger (1994) warns against heterogeneity in group composition as this acts as a threat to external validity. In contrast, there is a concern that homogeneity in a FG may inhibit discussion, especially when there are power or status differences between group participants. Kitzinger (1995) acknowledges that status differences may inhibit some participants, this does not mean that people’s real thoughts will not emerge.

#### **3.3.2 Interaction within the Focus Group**

Krueger (1994) states that interaction is a functional device for ensuring that data are gathered. In contrast Kitzinger (1995) claims that interaction is a central analytical resource and inherently valuable in itself. It is one of the defining features of FGs as a research method. When group dynamics work well, co-participants act as co-researchers, taking the discussion in unexpected directions (Kitzinger, 1994). Interactions in group work also allow for the generation of theory rather than the mere testing of it. This was also the experience with our FGs, that the discussion sometimes took a different direction than we anticipated in advance, thus giving us valuable data that we were not aware of prior to the FG interview.

### 3.3.3 Generalizability of Results

According to Krueger (1994) with an adequate number of homogeneous FGs with randomly selected participants, results may be generalizable to populations from which the groups were drawn. As would be expected, Kitzinger (1995) is more cautious about making claims for external validity, arguing for transferability based upon the theoretical saturation of data segments. At this point, it is up to the reader to make a judgement as to the credibility of these claims (Freeman, 2006). Therefore, results are more likely to yield conceptual insights and illumination rather than generalizability (Kitzinger, 1995). Stewart et al. (2007) also consider FG results to be idiosyncratic and therefore difficult to generalize. However, this does not mean they lack value – indeed, they possess the kind of ecological validity not found in other kinds of research such as traditional surveys.

## 3.4 Phenomenology

A researcher's epistemological stance can have a major influence on their choice and application of research method. Bradbury-Jones et al. (2009) discuss this in relation to phenomenology and the use of FGs. The primary objective of phenomenology is to investigate and describe phenomena as consciously experienced, people's "natural attitude", prior to critical or theoretical reflection (Husserl, 1983). The underlying belief is that it is best to research phenomena through the eyes of the person(s) having the experience. To be human is to be interpretive, with the interpreter always bringing their own experiences and frames of reference to their understanding of the phenomena. Therefore, understanding is based upon interpretation of phenomena not on a description of them (Bradbury-Jones et al., 2009).

He further claims that the researcher does not arrive at an objective description of the phenomenon being studied. Instead, during data gathering, the researcher shapes the interview, but in turn is shaped by it. Hence, in FGs, the researcher is engaged in a process of "mutual interpretation with participants". FGs may also be relevant to phenomenological research in that the approach may help researchers to support their assumptions when they are challenged by group members. The researcher, then, is able to arrive at a clearer and richer understanding of the phenomenon under study (Bradbury-Jones et al., 2009).

### **3.5 Ethical Considerations**

There are some specific issues that concern the ethical conduct of FG. The first is that ethical principles is of course a challenge within all approaches to research as it is for FGs. An obvious reason is that confidentiality is difficult to keep since statements made by participants will be heard in a public forum. Confidentiality can therefore only be promised within certain constraints as for instance consent forms.

Using groups or teams of participants from the same organization or sector may have far-reaching consequences once the FG is over. Barbour (1999) suggests that this is factored in during sample selection to identify and avoid combinations of groups where conflict is likely to occur. This was also the case with our participants. We therefore chose one port for each FG and supplemented with participants from the academia that had extensive knowledge of the port industry and could be acknowledged as peers by the port.

## **4 Results**

Thru the conducted focus group interviews, the participants representing the ports authorities had several interesting perspectives and observations that shed light on the research question for this thesis.

The method gave valuable insight to and understanding of the informal and tacit knowledge related to the port and its stakeholders concerning the theme of my thesis.

Ports are a vital part of the transport network and the supply chain. Some ports authorities also take a responsibility or incentive in participating in the regional business development, but how do they handle the different challenges and possibilities that come with this extended role.

By arranging four focus groups interviews with four different ports in the Norwegian ØKS area I was able to understand more thoroughly the mechanisms and collaborations between PA's, owners and port related businesses (business development and stakeholders) and what ports are a part of concerning port development.

As the respondents show, there are many obstacles and challenges for a port, from growth and development of a port to regulatory and political challenges. Some of these challenges are more or less known and not only typical for ports authorities but for other political governed and owned entities. There are many challenges to be addressed in regards to sustainable port- and business development by the PA's and its owners (municipalities). As my aim was to investigate the ports authorities potential for sustainable port- and business development, the results was diverse, giving

me an opportunity to identify the drivers and barriers of the ports potential to deliver added value within sustainability but also as a wider economic impact.

## 4.1 Challenging Identity

“Everything the port does benefits society, but make money for god's sake”, this quote by one of the ports owners, sums up the expectation that municipalities have for their port.

As stated by one of the ports, they are a governmental (municipality) run organization, having issues with both thinking and acting as a commercial business (limited company) and as a government institution.

One of the respondents said that when he started as port manager he realized that the municipality did not understand commercial business policy. Not uncommon mixing commercial and governmental business theory together as is typical for ports. By working relentlessly and uncompromising to promote the port as a tool for the whole municipality and region, the politicians started to understand the value of the port. Today the port is the most important actor for establishing new businesses in the region, together with its owner, the municipality.

One Challenge that describes the two different organizations is the use and understanding of the budget. Whilst the Municipality budgets with a contribution an or dividend from the PA to run schools, kindergarten's etc., the ports authorities respond that it cannot promise any dividend, due to unforeseen circumstances and market fluctuations that might occur more than one year ahead of time. If the PA are to deliver the municipality's budgeted dividend one year before the port ends its fiscal year, it has to secure profit to pay the municipality. This can, according the PA, only be done by increasing the prices on the port services that do not have any competition, because if the municipality's dividend is secured by raising prices on competitive services then it is likely to lose customers and goods volume. As a result, the PA increased prices on services offered to local residents resulting in protests against the PA, even from the municipality itself.

Another challenge described by port A is that the municipality approves projects that are carried out accordingly. When the PA have projects in cooperation with its customers, there may be delay due to many external reasons that is out of the ports authorities hands. They then need to postpone the projects, investment and costs, waiting for infrastructure development or business establishment. This creates accounting challenges for the municipality; because the PA, according to the municipality, must spend all the budgeted investments and costs within the year they are budgeted and not allocate them from one year to another.

Going from being a part of a ridged bureaucratic organization, the PA now has a more efficient collaboration with its owner. They look at their region as one company and or entity consisting of the PA, the municipality (politicians) and the municipality owned real estate Development Company.

Port A emphasizes that there is a need to increase knowledge and understanding between the actors. The PA participates in the weekly meeting between the municipal decision makers (management) with different topics on the agenda, giving the port an understanding of the challenges in the municipality but also giving them an opportunity to inform the municipality of the ports role and potential in the region.

Port A points out that the port itself does not have any value other than being a tool for the municipality. The requirements set for the port by the municipality are development and facilitation, making sure that the port attracts new businesses and thereby generating new jobs.

The PA do not oppose the collective good of the municipality, as it is “for the greater good”

## **4.2 Taking Risks**

The handling of risk is differently for the ports authority and the municipality. As the PA operates as a commercial actor, it looks at risk as a natural way of developing, whilst the municipality is highly risk averse. This creates a challenge when the PA wishes to expand or to attract more businesses.

Risk is also an issue where the municipality and the commercial port differs. The PA’s role in the business development requires investments and hence risk. This is something that the municipality are reluctant to get involved in, but as the owner of the port it has to decide, yet reluctantly.

One PA handles this by defining a clear role distribution between the PA and the municipality. By taking risk, the municipality are taking a chance that might have large political consequences and making jobs unsecure for both the administration and the politicians. By mitigating this risk to the PA, the municipality are more comfortable if the result is failure. The PA assumes responsibility in connection with investments taken by the PA with financing from the municipality. This is unusual in a bureaucratic and public context and it gives the politicians peace and assurance that they will not become scapegoats.

Port C claims that a limited company (Ltd.) has a little more freedom to establish or develop the company, a shorter decision paths and can isolate risk in a slightly differently than a municipal company can.



The ownership structure is of importance. Public companies can also do this but is dependent on how one is structured in relation to political risk. Changing the political picture can allow the politicians to influence decisions or processes involving the ports and their commercial customers. This constitutes a political risk for the businesses in process with the port and makes it difficult to establish a partnership between ports and businesses since the political risk is too high.

### **4.3 Development of Land:**

To be able to attract new business the PA needs vacant land that is ready to build on. This means that new land for businesses has to be regulated and have all the governmental and legislative approvals for construction. This takes time, sometimes a very long time. Time that the companies don't have. There is a competition between the ports and the regions and even internationally, for attracting new business, says one PA.

Port C states that : «There is a competition between regions and between municipality's and having a finished regulated area is a competitive advantage for the region»

This is supported by port B that states, "You Can't work with land development while someone is knocking on the door" elaborating that the municipality does not act swiftly enough on inquiries from companies about establishing new business or relocate existing. This indicates that there is a need to adjust the ports business model so it becomes an advantage for the port when trying to attract new businesses and that the role between the PA and the municipality should be more clarified.

Port D also states that the PA; "Has a need for large areas with expansion opportunities and good infrastructure" and "Just as important as developing land is establishing infrastructure (power, cooling water, roads etc)" while port C states that they are more a "supplier of infrastructure" adding that ""Access to infrastructure is what makes areas for business development attractive" Those who depend on a port for transport are willing to pay a little more for locating in or near a port. One of the PA would like to buy land and engage in business development but lacks capital, instead they are linked to a private business development company. Even if the PA has not been given a role as a business developer by the owner (Municipality), they partly take that role, as they are an infrastructure supplier and need to secure infrastructure and capacity in the infrastructure to meet the needs of new port related business development.

The process of regulating land is a time-consuming and involves many stakeholders. As one port say: "The municipality does not understand its role by regulating new land before the inquiry's come from the companies. They are not willing to take the fight with the nature conservation

association, neighbors and other stakeholders. That role seems to be changing and now the municipality better understands its role” adding that it is; “Not the ports role to argue with politicians so that they take the fight that comes with regulating and facilitating for new businesses and business development”.

The municipality must know their role when working together with the PA and deliver services and products so that the PA have something to “work with”.

Port C say that the PA acts as an advisor with logistics and transport expertise in connection with giving advice to other real estate developers, new business start-ups, potential synergies and other logistics and transport issues that others have not thought of.

It is more important for the PA to bring in actors who uses as much as possible of the port services, than one who only focus on road to road transport. The PA looks at business development and business establishment as a way to strengthen port operations.

Lately there has been an increase in larger companies with the need for large areas, like Battery factories and data centers. Presently there are a lot of competition between the different regions in Norway for attracting these businesses. There planed five new battery factories in Norway by 2025 resulting in approx. 20-30.000 new jobs (NHO). These businesses are in need of large areas and one of these new factory’s in process of establishing in the Oslofjord region measures approx. 600 m wide and 1,2 km. long. There is a resemblance to the old “power-intensive industry” that was prominent in many Norwegian fjord at the start of the century. This industry was established where there was power, then shipping in the raw materials and out the finished metal products. The Battery factories have the same focus as the old smelter companies but even more on the green and sustainability part of their production, logistics and raw materials. As these factories are in need of a green and sustainable alibi and we see several of these companies establishing near a port and close to or in proximity of green energy from hydropower plants.

These new businesses require finished regulated land before an offer is made to these new companies. This indicates that it can be done, if the reward is high enough for the municipality or region, contributing to a huge amount of new jobs and new supporting businesses. Respondent C informs that one nearby municipality submitted an offer to build a battery factory with pre regulated land. Another port informs that they together with the municipality have successfully submitted and won an offer for establishing a battery factory and had in advance regulated an area for this factory, the same goes for port D. The two ports have in this case taken a more active role then port C and argues that the ports better understand the needs of the new battery factory’s, like logistics,

transport solutions and infrastructures, vital for the factory to succeed. In this case the PA takes a more active role in the business development phase than what is expected or customary.

All the ports confirm that they get requests from new businesses wanting to locate in the port or near the port area. One of the reasons that they contact the PA is their planned use of the port for shipping and the use of the port infrastructure. None of the PA's say they have a system of routing new request directed from the municipality to the port. One port is part of a joint company together with the municipality and a few other shareholders taking the role as business Development Company in the port region. This mainly result in moving company's around that already use the port as their means of transportation not increasing "new goods" thru the port that before has been transported with other modes.

Port B stated that "Development of new areas is very demanding; there are strict requirements for regulation and the regulatory processes, hindering much of the development in and by the port. PA's and municipalities should start thinking more long term like adding large areas to the municipal area plan."

#### **4.4 Leadership:**

"A port does not have to be privately owned to operate efficiently, it is probably as much about management as ownership." states port A. We see over the past 10 years that the ports have adjusted to modern leadership and leaders. Going from using the term "Captain" to "CEO"(chief executive officer) or Port Director as the title of the port manager, there is also a shift in the business concept for the port. Goods over quay is not the only revenue anymore and there is even a strong commitment on developing and utilizing knowledge beyond the traditionally shipping related issues, to attract new business that can increase the amount of goods going thru the port and increase rental income. With new opportunities for the ports there could be time to develop new business models, as PA's increasingly want to obtain more land, attract new businesses, take a more active role as an owner, facilitating for new businesses, act as a networker and connecting companies that can have a potential for synergies and symbiosis. One port points out that ""Leave our legislative obligations to the municipality and develop us as pure commercial actors" adding that a lot of the legislative obligation that a PA has today can easily be done by the municipality giving the PA more time and resources to focus on local and regional business development. This is also supported by another port saying: ""What we spend the most time on is what matters least, often local issues from the municipality that the port must solve". The PA states that they are a separate legal entity and a professional business player and they oppose a number of municipal tasks that are forced upon the PA by the municipality. The PA is given local legislative tasks and

must do a lot of mandatory work that does not create value. The municipality replies that, “You have done so for more than 100 years so why not?” It is difficult to create growth and jobs when you have to perform resource- and time-consuming municipal tasks.

Port A states that politicians often take on the role as ombudsman for individual cases. Picture in the newspaper, etc. forgetting about the overall agenda. Many port municipalities have a wide range of different political parties in their municipal council. Some parties and politicians are elected for individual cases and only have one agenda, some wanting to close the port or relocate it, getting to the most valuable and lucrative areas in a city for urban development. “You can’t just be an ombudsman and not a politician”, as a politician you must work to improve elderly care, schools, education and increased prosperity in society. As one port say: "Never elect a politician who does not have an overall goal of where he will be in 4 years". One port also emphasizes that; “Success breeds success and success breeds credibility" one false move or failed investment will cause one to lose trust and confidence.

Another port states, "If you are a leader in a state or municipality-owned company, people don't challenge you for being reactive or lazy. But if you take a risk and fail, it can quickly become a huge issue and a blame game" adding that, "It is difficult to get a second chance if you fail and the situation can quickly be used against you by politicians, most often by the opposition."

## **4.5 Sustainability**

Becoming sustainable and shifting towards greener solutions is also an important task for the ports as for society in general. So far, the ports have focused on installing cold ironing and upgrading their equipment and transport solutions to comply with the general climate goals set by EU, UN, local, regional and national government. Are the PA's aware of the changes in both requirements and possibilities, giving them an opportunity to be in front?

Port C claimed that: “If you have many port related green or sustainable businesses, you obtain a green image and achieve a competitive advantage in competition with other ports that do not have as much focus on it” , as a result you may then have a competition between regions and between ports.

"The belief that we as consumers are willing to pay a little bit more to be green, is the reason why businesses are focusing on this." Adding that things are starting to happen and there is a stronger focus on sustainable logistics and "Recently buyers of transport services and goods owners are interested in paying more for a greener transport"

Freight forwarders and transporters say that they for a long time have had to produce environmental documentation that is worth something to the goods owner as long as the cost of green transport is equal or lower than ordinary transport, if not then the environmental documentation is not worth anything.

One port say that a change is happening. The major players are showing the way and taking environmental responsibility. The ports still see challenges and report that some businesses have switched from complicated and expensive sea transport to road transport. Resulting in cheaper and easier transport and delivering the products on time. This sums up the challenges for sea transport namely price, flexibility and time.

There are those businesses that try to increase their sustainability by innovations, like ASKO with the sea drone and Yara with their “Yara Birkeland”. ASKO has an ambition to become a zero emissions company by 2026 and believe that it will be a commercial advantage, attracting more consumers.

The green shift that is happening in companies today is a "Race towards consumer power" and especially for companies such as food chains etc., companies that we all have a close and real relationship with when visiting their stores shopping for groceries, often many times a week.

Port B supports by stating: “We are going to make money on becoming greener, we understand that business case and no one survives without adapting to the green shift.” Confirming that it is both a business case and survival for the port, to take an active part in the green transition.

Port A states that “Investors and consumers will set stricter environmental requirements.”

For some businesses the environment is even more important, like for battery factories where the environmental footprint of their whole operation is a vital part of the end product using clean renewable energy, sustainable raw materials and environmental friendly transport.

Port B implies that they have not put forward any type of environmental requirements to new or existing companies in the port. The companies have been pushing for sustainability and not the port. Circular companies set requirements for the port, the port must adopt to their needs and the companies and the port all learn from each other. This quickly spreads to the other companies in the harbor when these companies together with the port focuses on the environment and circularity.

As one port say: “Look at the quay as an environmental friendly resource for the companies in and around the port” opening up for more sustainable businesses in the region.

## 4.6 Competence and Governance

Port D states that they are a small organization and depending on flexibility and that employees fills several roles. Port C states that they are constantly in contact with landowners and other stakeholders who want to establish business or develop business areas. They could therefore need a marketing manager in the port to coordinate inquiries and opportunities regarding new port related business and business establishment, but also to be more proactive towards potential customers. Port A say “We need to obtain competence in the port to handle risk projects” adding that "Daily operations takes the focus away from development and opportunities for the port"

The port is a tool for achieving regional growth, as one port stated. Politicians are highly qualified to be on the board of the port when the port is aiming for growth, new jobs and development of infrastructure. The challenge comes when you come down to more technical port issues such as expanding the quay, changing cranes etc. Port A also mentions that it would be nice with more logistics expertise among the politicians on the port board and that the optimal would be a good mixture of competence. If there is a strong focus for the port on commercialization and not the societal benefits, then you can replace the politicians. This is supported by port C that the optimal representatives at the board should be, “A politically elected board with a professional approach”

Having politicians on both sides of the table, in the board and in the municipality, does not necessarily simplify the processes for the port. It is very people dependent, stating: "There are no benefits for the port being owned by the municipality, we are treated just like everyone else and maybe a little stricter too".

"The advantage is that the board have contact with those in the municipality who decide but those who decide in the end do not favor the ports that they own."

One port board suggested removing the affiliation with political parties in the annual reports, underlining that they are not there as representatives from different parties but as persons.

One port have a supervisory board of politicians that selects a non-politician as head of the board and this person appoints the rest of the board.

## 5 Discussion

Base on the results, there are several aspects that will be addressed in this chapter. I will discuss the most relevant results and findings in the context of the theory described in chapter 2.

Much of the focus and scope of this discussion is due to the conclusion where De Langen et al. (2020, p. 21) states; “This paper is to our knowledge the first paper which deals with the implications of CE for the business model of the port development company.” This narrowed down the theory that can be used for this thesis and I have therefore included basic port management and governance, port business model and network, and port sustainability as a fundament for this discussion.

Port operators (PO) have traditionally focused on more efficient port services and cargo handling, in an effort to reduce costs and increase profit, in addition to utilizing port equipment and resources for increased turnover and hence profit. The PA’s have focused on concessions, port calls, utilizing port equipment, infrastructure, quays and development of the port and its properties. This thesis investigates the possibilities for PA’s to contribute to sustainable business development, generating more cargo flow thru the port and thereby increase both turnover, profit and contribution to sustainability and environmental improvements within transport and logistics services for PA and PO.

### 5.1 Challenging Identity and Risks

Verhoeven 2011 explains the ports balance of power with government as follows:

“Whereas ports may have a bottom-up approach to take on facilitating and business development tasks, this is often not the objective desired by the municipalities that own and control them.”

Although public ownership of ports does not have to be a constraint for efficient behavior, it may generally be an inhibiting factor to pursue entrepreneurial strategies given the potential conflict with the regulatory function.

The level of the public ownership (i.e. national versus municipal) could also influence the interaction with local stakeholders. The inter-relation with government would also influence the extent to which hinterland strategies beyond the port can be developed. Political influence in publicly owned ports are difficult to avoid and complete absence of political control can be counterproductive, leading to monopolistic behavior, preferential treatment of port users, wasteful overcapacity, white elephants (Verhoeven, 2011)

PA's have issues related to their identity. Being both governmental and private gives them some interesting challenges, having to serve the common good and making profit. Van der Lugt et al. (2013) describes the challenging role of the port and defines them as a shared value hybrid organization with both private and public characteristics.

One of the ports have handled this role quite well balancing the two types of organizations in a good manner. The port manager has not been afraid to make his stance or take risks on behalf of the municipality, mitigating the risk and responsibility from the politicians and municipality. The way he solved this somewhat ambiguous situation was by paying attention and showing interest to the other leaders in the municipality, participating in municipality meetings learning from and informing other participants about the port. By actively listening and communicating, the PA and the municipality established a common understanding of the port's potential and the municipality's needs and contributions. The importance of communication between these parties are vital, for their symbiotic relationship to work, given that they both need each other to achieve a common goal. The port establishes trust that again leads to minimizing the political risk dealing with private actors. To be successful in business development De Langen 2020 point out that the PA needs an organizational structure and culture in which committed teams can thrive and risk-taking is accepted. Business development is a joint team effort, and most certainly requires risk-taking. It is typical for government-owned organizations to stay away from risk-taking. As a consequence, business development is unlikely to be successful.

The definition of roles between the two entities are unclear. It's obvious that the PA and municipality not always are pulling in the same direction. But the group interviews reveal that it can be done when larger projects like battery factories are on the agenda, then they are swifter to regulate and facilitate, when the reward is high enough in one project. It is probably easier to do one large project than many small ones when it should be the same process for all new projects. This should be the case for all business development projects, small or large.

## **5.2 Development of Land**

To take part in business development PA's can utilize their own land or cooperate with private development companies to develop new businesses, and to facilitate and offer them the use of the port infrastructure and its services. One port emphasized that it is not important if the port or a private development company owns the land that is been developed, if the increased goods flow through the port. They actively cooperate with the private development company to develop new



businesses and could be considered a public-private partnerships (PPP). Panayides et al. (2015, p111) defines PPP as:

“Co-operation between private and public actors with a durable character in which actors develop mutual products and/or services and in which costs, risk, and benefits are shared and mutual added value is created”. This approach to port development requires creating stronger interdependence between firms in the port, with the PA taking a proactive role as part of the development processes. This refers back to the hybridization of PA’s and the challenges of balancing private and public interest within the port, that is vital to the changing governance structures founded in the political impact of ports.(Kringelum, 2019)

There is a competition between the ports, the regions and even internationally, attracting new business and availability of land is a competitive advantage. All of the ports claimed that the regulation process and having available land was a challenge. Either because the time it takes for regulating land due to bureaucratic challenges or because of distribution of roles and division of responsibilities. The lack of business models in the port sector is also a challenge when it comes to new ways of organizing the ports with regards to the needs for becoming sustainable (De Langen et al. 2020). The landlord principle has been the dominant port governance strategy for European ports and also for the investigated ports. Building new sustainable, circular and symbiotic businesses in and around the port requires more land and infrastructure to be developed. The process of regulating land is a time-consuming and involves many stakeholders. The municipalities must take the role as both regulator, visionary and incubator by taking the fight with stakeholders that are affected by the consequences of regulating new land. By informing and giving landowners a possibility to participate or making use of the many benefits for new industry, it may ease the troubles for some of the effected parties. On example is the farmer and or landowner that might benefit from new industry that enables free heating of greenhouses being built in connection to a battery factory. By giving up land he can obtain free heating to be used for his choice, greenhouses, livestock, chickens etc.

There are many ways to develop land for new businesses. A neighboring municipality of one interviewed port have long regulated and developed land for new businesses. Their approach and modus operandi have long been discussed and debated but remains a strategic success. The municipality takes on the job of negotiating with landowners for an option to buy up land at a predetermined price. They then merge the different options to one large development area which then is regulated for new businesses by the municipality. The options are then exercised, and the municipality turns around and sells off the new regulated area to new businesses, taking a vital role

in business development in their region. The municipality is today one of the most successful logistics and trade centers in Norway. Profiting on the “regulation fee” is maybe questionable but at the same time it can be justified as socio-economic beneficial for the municipality and region. From having net commuting out of their municipality, they now have net incoming commuting, evident that new jobs are created in the municipality.

### 5.3 Leadership

It’s not just ownership that determines if the port is run efficiently, but also leadership, say one port. De Langen 2020 emphasizes that a port must develop leadership capabilities for taking risks and initiatives avoiding a “dominator” attitude that captures value instead of creating value. Dominators do not share value with others as good leaders do in the effort of creating an “economic ecosystem”. Another challenge for government owned ports is to distinguish leadership and authority.

Leadership is earned and authority derives from power. A PA cannot be successful in business development just based on power alone. This is exemplified by the title used for port managers, from previous “captain” to the more commonly used “CEO” or port director.

For our ports we see clear similarities to De Langens (2020) theory, where all of the PA’s have a modern leadership handling employees, stakeholders, customers and owners with very good leadership skills.

One of the PA’s claimed that he as a port manager would be much more comfortable being “lazy” and not proactive and taking risks. Indicating that leaders of governmental entities that only do a minimum of what is required, is not criticized for that, they are more likely to get criticized for taking risks and active developing the port involving stakeholders and people that have an opinion or critique of what you are doing. This is one of the challenges a port manager has when taking a role in developing the port and port related businesses.

To achieve a more proactive and commercial business approach the port might detach themselves from the governmental bureaucratic, and often ineffective, way of functioning.

According to Verhoeven (2011), a port can be identified by a *hypothetical typology* by identifying a number of governance-related factors. This determine where ports can be positioned in this typology. (Table 1) As stated by the port, the easiest way for a port would then be to act as a “conservator”, a port that concentrates on continuity and maintenance sticking to a mechanistic and passive implementation of the three traditional PA functions at local level. Because of this low-profile attitude conservator, the port may become marginalized and even extinct.

Instead this port is, according to Verhoeven (2011), more of a “facilitator”.

A port profiling itself as a matchmaker and mediator between economic and societal interests, hence the well-developed community manager function. A “facilitator” also look beyond the port trying to engage in strategic regional partnerships. Verhoeven (2011) claims this type of ports find most support in literature for the fine balance it represents.

The PA do many of the municipality’s tasks that takes a lot of time and do not create value. Municipalities reply with an historic argument that ports have done these tasks for more than 100 years and therefore they must still do them. This is an example of the rigid and somewhat ignorant attitude of how municipalities perceive the port. The ports are changing but the owners, the municipalities, are not up to date regarding the ports new role and the possibilities it represent. (Cahoon et al., 2013)

The devolution of national and port-related rules and regulations is something that the respondents reacted negatively to because it took too much focus from the business aspect of running the port and the ability to engage in business development. Some of the tasks that are given to them from the municipality could easily be done by the municipality.

If the PA’s have common tasks that are imposed by their municipalities, a solution might be to outsource these joint tasks to a common municipality company (Interkommunalt)

This way the PA can free up resources to be used in creating value for their port and region.

Collaboration between the ports have traditionally been challenging in Norway, and one example is the port collaboration project “Havnealliansen”. These collaborations may now have a second chance also focusing on business development in addition to port operations (Dooms et al., 2013).

## **5.4 Sustainability**

One port pointed out there is a need to fully utilize the port as facilitator and developer, attracting more business and creating more jobs for the region. One good example would be the new battery factories and data centers to be located in Norway, creating a large amount of new jobs for the region in which it is located.

A new report from The Confederation of Norwegian Enterprise (NHO) estimates that the new battery factories in Norway will create more than 30 000 new jobs and with a yearly turnover of approx. 90 bill NOK. What is questionable is that there is not one word in this report about the possible benefits from circular or symbiotic collaboration that is possible with these new factories. (Recommendations for industrial investment in batteries in Norway, NHO, 2021). The lack of this type of knowledge or competence is evident, not only in this report but also within research and among ports in the region and ports in the focus groups. (De Langen et al. 2020)

If there is one obvious benefit to these new factories and industry it is their great potential to start a symbiotic and circular economy in the area they are located. These factories will need huge amount of clean energy provided by power cables with extensive capacity and water for cooling. After cooling the water is then pumped back into the sea with a temperature of approx. 15-20 degrees, perfect for fish farming or algae-production on land and even for heating up large areas of greenhouses (Sotenäs kommun, n.d.).

By developing a complete or semi-complete circularity locally, it is possible to create even more jobs and new businesses.

The ports in the ØKS region are small and might not be able to facilitate all of the new businesses needed to complete the symbiotic circle, but if these businesses are located near a port, it can easily transport waste or other materials needed, as input to another company located near another port. This way the circle can consist of two or more ports with different companies dependent on each other for raw and or input materials. This new business opportunity for the ports can potentially generate more goods and transport thru the port system, creating more income and rent. This inter-port collaboration can be across national boundaries or in close proximity reflecting a new approach to co-opetition in the sector (Dooms et al., 2013). This Inter-port collaboration can for instance take place by starting feeder-and-hub port relation (Low et al., 2009) increasing connectivity and thus potential growth in ports.

As pointed out by De Langen et al 2020, increased circular economy in ports will generate less cargo thru the port but on the other hand, it will generate more rental income and also generate more jobs locally. By connecting ports together in a circular or symbiotic circle this may also give the ports more transport to compensate for less transport over quay, due to the increased inter-port transport of goods. As the results also indicate, increased use of the ports will again contribute to an increase in sustainable and green transport.

According to the respondents, there is an increase in environmental awareness among the transporters and most with some of the major producers and goods owner.

The municipality and port have a common task of becoming more environmental and sustainable in their operations and together reach the goals set by the UN, EU and other national authorities. This implies collaboration and using the port as a tool to achieve this goal, as one of the ports stated. If you have a tool that can be efficient and “do the job for you” then it would be wise for the municipalities to use that tool. The ports have help from their transporters and port users that look at the green shift as an opportunity to win the "Race towards consumer power". This can partly be done by using the port as a logistics provider and of green and sustainable services. For modern

companies the environmental footprint of transportation and handling of goods needs to be in compliance with the overall environmental goals of not just legislators but also the public. This creates an opportunity for ports to adopt and be in front, offer new innovative sustainable solutions and participate in sustainable business development giving the port possibility of a win –win situation.

At the same time one port pointed out that they still see challenges and reports that some businesses have switched from complicated and expensive sea transport to road transport. Resulting in cheaper and easier transport and delivering the products on time. This sums up the challenges for sea transport namely price, flexibility and time. This also strengthens the theory that there is a competition between the different supplychains. (Verhoven 2010 and Meersman et al., 2010)

## **5.5 Sustainability - Network and Business Models.**

Ports have some focused on circularity or symbiosis, according to the results. One port that have substantial industry activity in and around the port, has started to get involved with external stakeholders and local circular initiative networks. They are also developing a new strategy that will take into consideration circularity in port. They have some circular activities in the port now but the port claims that these companies often find each other, without any PA involvement.

Optimizing the use of existing network could be an effective way to further develop the port with regards to circular and symbiotic collaborations between the port actors and contribute to sustainable business development.

Network is different in relation to circularity than traditional port networks and Kringlum (2019) describes working with circular and symbiotic networks as a challenge. Trust is more important with regards to output from one producer to input for another. Opening up on production methods and use of input factors in production are information that is regarded as a competitive advantage.

Building relationships between companies to increase the competitiveness of a port can be difficult for PA's because of the low degree of trust between port actors and the risk of opportunism that exists within the port system (De Martino and Morvillo, 2008; De Martino et al., 2015). The collective achievement by firms in a port system can benefit both the competitive advantage of the firms involved as well as the performance of the port. De Langen (2002) argues that this is why the port must take on a new role as cluster or community manager. When investing in port clusters, we see that the motivation for PA's is the potential for generating new income (de Langen and Haezendonck, 2012). Facilitating port clusters will place a wide range of new demands on the

organizational capabilities of the port to guarantee organizational value creation in addition to the competitiveness of the port in general (De Martino et al., 2015).

Traditional networks in ports often relate to what the port can do for the port users, like infrastructure, opening hours, services and sustainability in port. Sotnäs municipality is one example of how to lead a network on circularity and symbiosis taking the role as administrator and facilitator of the network raising money for developing the network, facilitating synergies and building trust between the actors.(Sotenäs Symbiosentrum, n.d.). This work should be implemented in a business model for the port to use as a template of how to involve, inform and activate the port actors so to exploit the possibility that are present and create new businesses end further develop existing ones.

From the interviews, I could not identify any port business models taking into account the circular or symbiotic potential or challenges. They often referred to their visions and strategies, with some references to circularity, not to business models or plans (Dooms and Farrell, 2017)

The motivation and key driver in setting up and facilitating network activities and coordinating the port users, is to increase traffic thru the port and at the same time increase the rent income as a result of developing land for new businesses. (Kringlum, 2019)

## **5.6 Competence and Governance**

Board composition has long been an issue regarding ports. The traditional port board usually consists of politicians from the municipality but sometimes, like with some of our ports, there are also private representatives present. Having a board of politicians can be effective for the port but also a challenge. As several ports pointed out, an ideal board should consist of politicians with logistic expertise, mixed competence and with a professional approach. In reality, this is not the case for ports. De Langen (2020) argues that business development requires a deep understanding of the supply chains that ports create value and accommodate for. An understanding that goes beyond recognizing “increasing ship sizes” as a trend in port development and requires strategic interaction with major actors in relevant supply chains. This confirms the ports statements of the ideal board and the competence needed to fully understand business development.

Summarizing the results from the respondents shows that the ports see the benefits in having a board of owner representatives. They contribute to the commercial activities of the port, getting greater knowledge and understanding of the cases being handled in the board and then later in the municipality. At the same time, this does not necessarily simplify the processes for the port, as it is

very dependent on the person serving on the board and acting as a politician in the municipality council. Several of the ports also reported that they are not given any “special care” in the municipality even if they are owned by the municipality. But on the other hand, the deep knowledge of the port and the environmental and social benefits it provides should give the politicians an opportunity to be more lenient or at least proactive to port development.

One port has a different solution with a supervisory board that elects the board. This is a solution with a board consisting of professional business representatives with mixed competences and with the head of the supervisory board present at all board meetings. This enables the leader of the supervisory board to be informed of all the port related issues prior to the cases and issues are handled by the municipality council. The use of supervisory board is more common in larger European ports and seems to be more appropriate in ports that are inter-municipality owned (IKS) (Sorgenfrei, 2018)

The board, port administration and the municipality must find an optimal way to work together to act more swiftly and adopt to the demands from commercial businesses. They must be in front not behind with regard to business development, this is evident in large projects like battery factories. About 19 proposals contested for a new factory in Norway recently and the municipalities contesting was all able to regulate or allocate land and plans for infrastructure on fairly short notice, proving that it is possible if the reward is high enough.

My discussion takes for granted that the PA’s have capabilities and resources to take actively part in business development, but many PA’s already have their hands full with expectations and goals that may hinder them in contributing to sustainable solutions that business development can be. This is known as the PA or PA-Paradox and means that the expectation is inconsistent with the performance potential. Meaning that the PA is often “all over the place” when it comes to what they want to archive or what they want to do. In addition, you have all the tasks that the municipalities expect them to solve. This can be a barrier for PA’s when trying to participate in business development as they have so many other goals and tasks, and for ports the maritime trade comes first and can be a reason for ports to not participate in business development projects, sustainable or not (Sorgenfrei, 2018)

## 6 Conclusion

Times are changing for ports because of many new externalities like, new environmental demands and expectations, globalization and anti-globalization, outsourcing and “near-sourcing”, pandemics, circular- and symbiotic economy and so on. As a result, the ports can adapt and use its resources and knowledge to be in front of the development.

Sea transport is the environmentally friendly way of transport and there has been many attempts to move goods from road to sea but with limited effect. By strengthening the ports ability to participate in business development, ports can contribute to increased sea transport by connecting new and existing businesses to the port and hence their use of sea transport and increased sustainability.

By facilitating, establishing networks and participate in business development the port can extend the goods flow thru the port and take an active part in the circular and symbiotic opportunities that are developing.

The port is a highly professional provider and expert of logistics and infrastructure that they can use to attract new businesses. Several new large battery factories and datacenters are now being built, representing a gratis starting point for the ports to add and connect new sustainable businesses, creating circular and symbiotic businesses in or near the port increasing goods flowing within the port and thru the port.

By offering the use of waste products from one company, production knowledge, logistics solutions, networks and expertise, they can attract new businesses.

Circular economy is not just scrap metal and other consumer waste products being transported thru the port, it is also about processing and using the waste by connecting and developing new companies, and establishing clusters that can “close the loop” within circularity and symbiosis.

If the loop cannot be closed in one port this opens up for inter-port collaboration with more transport between the ports involved in the “loop”.

There are need for more research and pilot projects within the circular and symbiotic port concept, as we are getting closer to the major environmental goals of 2030 and 2050.

The goal is therefore to prepare new project proposals to EU and national research programs about symbiotic- and circular ports, together with ports, academia, municipalities and port users.



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## **Figure and Tables**

Table 1: Basic port management models. (Sorgenfrei, J., 2018)

Table 2: Hypothetical typology of port authorities (Verhoeven, 2011)

Table 3: The PA-Paradox (Sorenfrei, 2018)

Table 4: Summary of the strengths and weaknesses of using focus groups. (Halcomb et al., 2007)