Robin Wiberg

The role of environmental sustainability in selecting the service provider. Case of selecting a shipping company.

School of Marketing and Communication
Master´s thesis in International Business
Master´s Degree Programme in International Business

Vaasa 2024

UNIVERSITY OF VAASA
School of Marketing and Communication
Author: Robin Wiberg
Title of the Thesis: The role of environmental sustainability in selecting the service provider. Case of selecting a shipping company.
Degree: Master of Science in Economics and Business Administration
Programme: Master´s Degree Programme in International Business
Supervisor: Minnie Kontkanen
Year: 2024 **Pages:** 89

ABSTRACT:

In the current world situation, people are more aware of prevailing environmental issues, and this awareness has also increased interest in them. Interest in environmental issues, on the other hand, affects our lives globally. One of the areas experiencing the effects is shipping, which is discussed in more detail in this work. At the moment, the whole shipping industry is living on the crest of a changing wave.

The main objective of this study is to examine and analyze the significance and impact of environmental sustainability in service provider selection. To answer the research question there will be three supporting goals that will be utilized. These goals are to analyze the importance of green supply chain management and identify the barriers and drivers of it, to define green procurement and identify criteria in choosing external service providers, and to identify the drivers, hinders, and criteria for selecting shipping companies based on environmental sustainability.

The theoretical framework of this study focuses on three main concepts, that are green supply chain management, green procurement, and the selection of green service providers. In more detail the focus will be on the aspects of internal and external green supply chain management practices, green supply chain management drivers, barriers and performance will also be examined. Green procurement examines the differences between green purchase intention and green behavior and the influencing factors towards green procurement and its adaptation. Green service provider selection in this study explores the green supplier selection methods, drivers, barriers, and both environmental and economic criteria affecting the selection.

This qualitative research was conducted through interviews with five participants among the case company's twenty biggest clients. The interviews were recorded and transcribed. After the transcription was conducted the results were categorized into four different themes to perform as efficient analysis as possible. In short, the results from the empirical analysis state that the interviewees were interested in environmental sustainability-related matters and that environmental sustainability has an impact and significance for companies when selecting service providers. Ecological sustainability can even be considered a starting point for the introduction of green solutions and for the adoption of new operating models.

KEYWORDS: supply chains, sea transport, sustainable development, economical sustainability, ecological sustainability, environmental reporting, green economy, biofuels

VAASAN YLIOPISTO
School of Marketing and Communication
Tekijä: Robin Wiberg
Tutkielman nimi: The role of environmental sustainability in selecting the service provider. Case of selecting a shipping company
Tutkinto: Master of Science in Economics and Business Administration
Oppiaine: Master´s Degree Programme in International Business
Työn ohjaaja: Minnie Kontkanen
Valmistumisvuosi: 2024 **Sivumäärä:** 89

TIIVISTELMÄ:

Nykyisessä maailmantilanteessa ihmiset ovat tietoisempia vallitsevista ympäristöongelmista, ja tämä tietoisuus on myös lisännyt kiinnostusta niitä kohtaan. Kiinnostus ympäristöongelmia kohtaan puolestaan vaikuttaa maailmanlaajuisesti meidän elämäämme. Yksi vaikutuksia kokeva, muutoksen keskellä elävä osa-alue on merenkulku, jota tässä työssä käsitelläänkin tarkemmin.

Tämän tutkimuksen päätavoitteena on tarkastella ja analysoida ekologisen kestävyyden merkitystä ja vaikutusta palveluntarjoajan valinnassa. Tutkimuskysymyksen vastaamiseksi tässä työssä hyödynnetään kolmea tukitavoitetta; 1. analysoida vihreän toimitusketjun hallinnan merkitystä ja tunnistaa sen esteet sekä ajurit, 2. määritellä mitä on vihreä hankinta ja tunnistaa kriteerit ulkopuolisten palveluntarjoajien valinnassa sekä 3. tunnistaa ajurit, esteet ja kriteerit laivayhtiöiden valinnassa ekologisen kestävyyden näkökulmasta.

Tämän tutkimuksen teoreettinen viitekehys keskittyy kolmeen pääkonseptiin, jotka ovat vihreä toimitusketjun hallinta, vihreä hankinta ja vihreän palveluntarjoajan valinta. Tarkemmin sanottuna, tutkimuksessa keskitytään sisäisiin ja ulkoisiin vihreän toimitusketjun hallinnan käytäntöihin, myös vihreän toimitusketjun hallinnan ajureita, esteitä ja toteuttamista tarkastellaan. Vihreä hankinta tarkastelee vihreän ostoaikeen ja vihreän käyttäytymisen eroja sekä vaikuttavia tekijöitä vihreään hankintaan ja sen sopeuttamiseen. Vihreä palveluntarjoajan valinta tässä tutkimuksessa tutkii vihreän toimittajan valintamenetelmiä, ajureita, esteitä ja valintaan vaikuttavia taloudellisia kriteerejä.

Tämän tutkimuksen valittiin olevan kvalitatiivinen tutkimus, ja se toteutettiin haastattelemalla viittä tapausyrityksen kahdenkymmenen suurimman asiakkaan joukossa olevaa tahoa. Haastattelut äänitettiin ja litteroitiin. Litteroinnin suorittamisen jälkeen tulokset luokiteltiin neljään eri teemaan mahdollisimman tehokkaan ja tarkan analyysin suorittamiseksi. Lyhyesti sanottuna empiirisen analyysin tuloksista on mahdollista luoda johtopäätös, että haastateltavat olivat kiinnostuneita kestävään kehitykseen sekä ekologiseen kestävyyteen liittyvistä asioista. Analyysin perusteella on myös mahdollista luoda johtopäätös siitä, että ekologinen kestävyys merkitsee yrityksille paljon ja sillä on vaikutusta yritysten palveluntarjoajien valintaprosesseihin. Ekologista kestävyyttä voidaan jopa pitää lähtöpisteenä yritysten vihreiden ratkaisujen ja toimintamallien käyttöönotolle.

AVAINSANAT: toimitusketjut, merikuljetus, kestävä kehitys, taloudellinen kestävyys, ekologinen kestävyys, ympäristöraportointi, vihreä talous, biopolttoaineet

Contents

Figures

Tables

Abbreviations

AHP	Analytic Hierarchy Process
ANP	Analytic Network Process
CC	Customer cooperation
CO2	Carbon dioxide
DEA	Data envelopment Analysis
DIGP	Degree of Involvement in Green Procurement
EPU	Energy Using Product
GHG	Greenhouse gas
GP	Green Procurement
GSCM	Green Supply Chain Management
IEM	Internal environmental management
IMO	International Maritime Organization
IR	Investment recovery
LNG	liquefied Natural Gas
LP	Linear Programming
RoHS	Restriction of Hazardous substance

1 Introduction

This study aims to find the methods that companies are utilizing when selecting shipping companies and suppliers in general. Moreover, this study aims to identify the drivers and barriers that affect green supply chain management practices. Lastly, the aim of this study is also examining green procurement and its utilization.

1.1 Background of the study

Over 90% of the world trade goes by sea, in the other hand about 2,5 % of global emissions are caused by maritime transportation. When comparing the environmental friendliness
of modes of transport, what matters is what is measured, the means of transport or the transport performance. Maritime transport is one of the most environmentally friendly modes of transport, especially for the transport of large quantities of goods. (Halonen, 2018)

Even if Maritime transportation is quite an environmentally friendly mode of transport, there are still several problems within the global field. The most significant emission that maritime transportation causes is Carbon Dioxide (CO^2), which is one of the greenhouse gases (GHG) that are the main driving factor of global warming. (Serra & Francello, 2020) Because of this for many years, the main goal of the shipping industry has been to reduce emissions from shipping and develop the industry in a more environmentally friendly direction. (Suomen Varustamot, 2021) The International Maritime Organization (IMO) set a goal in 2018, and the goal is to cut CO^2 emissions at least 40% by the year 2030 and 70% by the year 2050. These reductions have been calculated from the emission level in 2008. IMO has also set a goal that annual absolute greenhouse emissions must be reduced at least by 50% by the year 2050. These reductions must have been achieved even though the yearly traffic volumes are all the time on the rise, the only visible drop in recent years has been due to the coronavirus pandemic in 2020. (Soone, 2023) After

these goals by 2050, the global aim is to phase out the CO^2 emissions from the whole sector. (Finnlines, 2019)

Currently, the transportation sector is mainly relying on petroleum-based fuels, it could be stated that the most significant factor affecting the GHG emissions caused by maritime transportation is the type of fuels used. Luckily, the industry is rapidly moving to new fuel options by modifying current systems and acquiring new buildings. New buildings are, of course, a factor that will affect the industry only in the long run in the future, so it is also vital to be aware and utilize the options that can bring changes rapidly. (Khan, Sudhakar & Mamat, 2021) In addition to fuels, operational planning, speed efficiency, and data analytics are big factors that can help companies to guide toward the IMO 2050 goals. (Soone, 2023. p. 2)

When thinking about the selection of shipping companies Banomyong & Supatn (2011) have stated that there are 6 factors that needs to be considered when making the decision. These six factors are reliability, responsiveness, assurance, empathy, tangibility, and the cost of service. (Banomyong & Supatn, 2011) On the other hand Aktas & Ulengin (2005) states that there are 7 main factors that prepares the guidelines for the selection process for shipping companies. These seven factors are reliability of carrier, prompt response in the delivery cycle, carrier prestige, financial opportunities flexibility in customer inquiry, honesty and quality of operations management and delivery cycle, ease of collaboration, and lastly accurate order receipt and follow up. (Aktas & Ulengin, 2005).

Before going into deeper into green procurement it is vital to understand the meaning of it. Green procurement is mainly divided in 3 pillars. These pillars are social, environmental, and economic. (Purvis, et al. 2019)

Figure 1. below describes the 3 main pillars and additional pillars of green procurement.

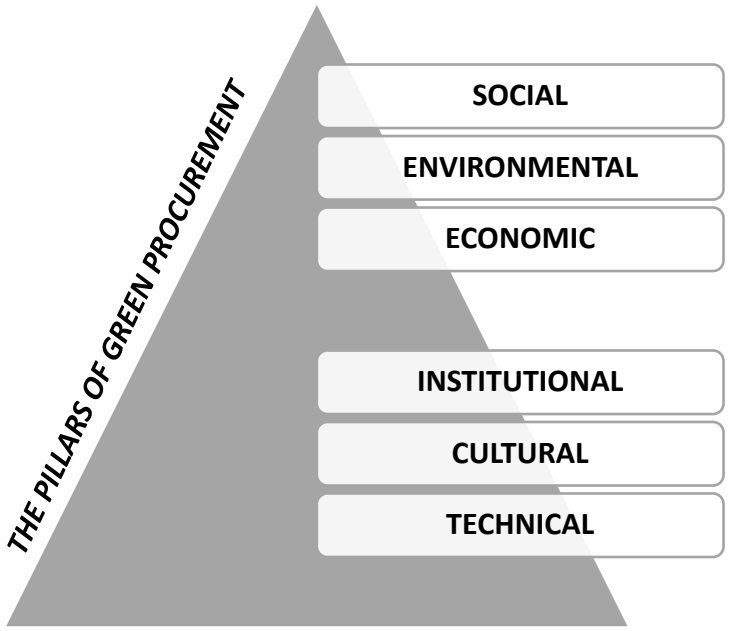

Figure 1. Pillars of green procurement. (Purvis et al. 2019; Stephenson, et al. (2018); Boogaard et al. (2011); Kaminsky (2015)

Even though the tree pillar model is mainly used, depending on the study, additional pillars are also used. These additional pillars are for example institutional as Stephenson, et al. (2018) have defined in their study. On the other hand, Boogaard et al. (2011) underlines the importance of cultural pillars in sustainability studies. Lastly, different from the previously mentioned additional pillars Kaminsky (2015) has added the technical pillar as the fourth pillar in the study.

1.2 Research gap

This thesis will be useful and timely since present studies are trying to find out an answer to the question of whether companies, that have knowledge related to environmental issues are modifying their processes and acquiring green products and services. (Moser, 2015) There have been some studies regarding logistics service provider selection, for example, Jharkharia & Shankar (2007) have studied it from the point of an analytic network process approach. On the other hand, Khan, et. al (2022) have studied outsourcing factors of third-party logistics services selection, and this study was focused on the courier company.

This thesis will stand out from the previous studies because it explores the correlation between expenses and supporting factors of maritime logistic service provider selection from the point of environmental sustainability.

1.3 Research questions and objectives

The main objective of this study is to examine and analyze the significance and impact of environmental sustainability in service provider selection.

To answer the research question there will be three supporting goals that will be utilized. These goals are as follows:

1. To analyze the importance of green supply chain management and identify the barriers and drivers of it.
2. to define green procurement and identify criteria in choosing external service providers.
3. To identify the drivers, hinders, and criteria for selecting shipping companies based on environmental sustainability.

1.4 Structure of the study

This study has been divided into five main chapters.

The study starts with an introduction chapter, that presents the background for the study and clarifies the research gap. In the introduction chapter the research limitations, research questions, and research objectives are presented. In addition, key terms, and theoretical framework are explained. Lastly, the introduction also explains the structure of the thesis.

The second part of this study is the literature review. The literature review consists of three main elements, which are green supply chain management, green procurement,

and green supplier selection. Green supply chain management has been examined in more depth, and its internal and external practices, barriers, drivers, and performance have been studied. The literature review also presents the green supplier selection methods and criteria.

The third chapter describes the research methods and approach, additionally, it asserts the execution of qualitative research. This chapter also clarifies the methods for data processing and analysis. Moreover, the third chapter provides basic background information about the interviewed companies.

The fourth part, empirical analysis, and results go through the interviews and the conclusions drawn from them utilizing the support of the literature review. In addition, the fourth chapter also discusses about the research and the results. Furthermore, the fifth chapter summarizes the main findings of the study, gives practical implications, and presents the suggestions for the future studies. Lastly, the final chapter will provide a list of references and appendices.

1.5 Key definitions

First of all, it is important to define the main term **sustainable development**. Du Pisani (2006) states that sustainable development means development that has been made so that it meets the current needs without compromising the needs of future generations.

Carbon dioxide on the other hand is one of the biggest factors causing global warming. Carbon dioxide enters into the atmosphere when fossil fuels are burned. So, in short, carbon dioxide is emission caused by the usage of fossil fuels. (EPA, 2021).

Decarbonization in turn is a little bit trickier term to be explained. Noussan (2020) explains that decarbonization is a term that describes and measures the actions that are taken to lower the carbon dioxide emission caused by the usage of fossil fuels.

So, on the other hand, it means a term that describes the removal of fossil fuels and replacing them with green fuel options.

When looking into **green procurement**, green procurement could be stated as a purchase or obtaining of goods or services in as effective and efficient way as possible while considering environmental, social, economic, and governance aspects. Green procurement practices can be implemented in both private and public sectors. Green procurement can be implemented either voluntarily or to comply with regulations or laws or to meet customer requirements. (Alibašić, 2020)

The next term to be defined **is green fuels**. Green fuels are fuels that are made from biomass sources by various biological and thermochemical processes. Green fuels are often called also as biofuels and by using those kinds of fuels it is possible to minimize the emissions caused by the usage of fuels. (Othman, et al. 2017)

2 Literature review

The literature review has been divided into three main sections that forms the literature base for this study. These three sections are green supply chain management, green procurement, and green service provider selection.

2.1 Green supply chain management

Mentzer et al. (2001) has defined green supply chain management (GSCM) as follows:

> The systemic, strategic coordination of the traditional business functions and the tactics across these business functions within a particular company and across businesses within the supply chain, for the purposes of improving the long-term performance of the individual companies and the supply chain as a whole. (p. 18)

Lee and Lim (2016) on the other hand describe that in short green supply chain management is just supply chain management that has been united with environmental thinking.

Nowadays when people are more aware of environmental issues, companies are adapting different strategies in order to gain competitive advantages. Lee & Lim (2016) states that green supply chain management has been seen as an advantage in the markets, when choosing products / service providers. Lee & Lim (2016) concluded in their study the results showed that it is vital for companies to build a corporate image based on eco-friendly values, this will in the end positively affect to consumer's purchase behavior. Over 90% of global trade volume is transferred with maritime transport, so it can be stated that maritime transportation is a big element in supply chains. (Lam & Zhang, 2014)

Environmental concerns as such are not a concept that has been taken into consideration only during the last years. Actually, environmental concerns have received attention already from the 1960's. When thinking about the consumer perspective, it could be stated, that the 1970's oil crisis was the factor that started consumers to think about

their purchasing behavior and choices when selecting products and services. Due to the 1970's concers, companies first adapted supply chain management practices in their operations already in 1970's and in 1980's companies also adapted supply chain management practices in marketing and manufacturing operations. (Lee & Lim, 2016).

The practices related to green supply chain management can be divided into two subgroups: *Internal green supply chain management practices* and *External green supply chain management practices.* These two groups will be examined deeper in headings 2.2.1 and 2.2.2. Both internal and external green supply chain management practices can be examined in the same way. (Susanty et al. 2019).

2.1.1 Internal green supply chain management practices

Internal green supply chain management practices can be divided in two, these are eco-design and Internal environmental management. (Susanty et al. 2019). Saeed et al. (2018) state that both internal environmental management and eco-design can positively affect to company from an economic and environmental point of view.

Internal environmental management can be seen as a foundation for green supply chain management. Internal environmental management is a practice, that shows and proves a company's sustainable ideology. This practice is distributed to everyone in the company from the top management by company management vision, all the way to the whole enterprise. *Eco-design* on the other hand is a predictive function, that is taken into consideration before commencing and implementing of other business functions. Eco-design can be defined as an eco-planning, meaning that all the company's operations have been assessed and reviewed in terms of sustainability before their implementation. Eco-design includes for example preventing of the pollution, energy usage minimizing, waste, and toxic emissions minimizing. (Saeed et al. 2018).

2.1.2 External green supply chain management practices

External green supply chain management practices can be divided in three, these three are green purchasing, investment recovery, and customer cooperation. (Susanty et al. 2019).

Green purchasing is based on a carefully planned and considered purchasing process that takes into account various stakeholders and process-related parties. The goal of green purchasing is to produce and provide as sustainable products and services as possible. The whole ideology behind green purchasing is based on awareness of environmental requirements and environmentally friendly choices. *Cooperation with customers* is heavily dependent on internal green supply chain management practices. In cooperation with customers, the customers are not seen as ordinary regular customers they are even rather seen as strategic partners, that bring both economic and sustainable value into the company. The main goal of cooperation with customers is to get them involved in the whole product or service lifecycle from the eco-design all the way to the implementation. Lastly, *investment recovery* can be seen as utilizing what was previously considered as waste and taming the opportunities it brings. Investment recovery can be considered as the commercial use of waste, surplus materials, excess equipment, and excess inventory in order to maximize profits and minimize losses. (Saeed et al. 2018).

2.1.3 Green supply chain management barriers

The barriers and issues related to green supply chain management practices and their implementation can be divided into seven different categories. These categories are as follows: technology and infrastructure related issues, governance and supply chain process related issues, economic related issues, knowledge related issues, policy related issues, market and competitors related issues and management related issues. (Kumar & Joji, 2023). These above-mentioned barriers are usually still divided into internal and external barriers. The external barriers can be still divided in four sub-groups that are

supply-side barriers, demand-side barriers, government regulation and other barriers. (Sajjad et al. 2020).

When looking deeper into these categories, technology and infrastructure related issues include for example lack of suitable IT systems and a lack of acceptance towards new IT systems and technology. Governance and supply chain process related issues include among other issues related to green practices towards waste management and energy management within the supply chains. The supplier's lack of enthusiasm related to green supply chain practices is affecting the whole supply chain and like this slowing down or even completely preventing the implementation of green supply chain management technology and design. The biggest example related to economic issues is the investment costs when implementing green supply chain management practices. These investment areas are for example green labeling, green packing, and green manufacturing. Knowledge related issues include both internal and external knowledge. The lack of knowledge can be seen in the lack of internal training for employees, but it can also be for example lack of knowledge in the stakeholders related to specific supply chains. When thinking about policy related issues, the biggest one is the lack of government initiatives, meaning that there are not enough benefits and suitable policies for companies that are including green supply chain management practices in their operations. Internal and external sustainability audits can also be seen as a policy related issue. There are several market related issues, but the simplest issue that can also be seen as a core issue is that customers are not aware of green products and services and the benefits that they produce. Management related issues have affects to the whole company from the top to down. For example, poor organizational culture, can be seen as a big factor that will also affect the motivation of the employees. Also, the commitment of the management is a big factor that has vital affects to the whole company. If the management is not committed to green practices and green supply chain management implementation there will be no changes in the daily operations. (Dube & Gawande, 2014.)

2.1.4 Green supply chain management drivers

The drivers for green supply chain management vary based on the research, but six of the factors that are presented in several studies are as follows: Involvement of top management, government regulation, competitive advantage, financial benefits, ISO certification, and customer demand. (Giunipiero at al., 2012.)

These above-listed green supply chain management drivers are generally divided into internal and external drivers. Internal drivers can still be further divided into two subcategories that are normative and instrumental drivers, some studies prefer to use the terms financial and nonfinancial goals. The ideology behind instrumental drivers is that companies implement green supply chain management practices only in order to gain profitability and to affect to company's reputation and competitiveness. On the other hand, the normative ideology behind the drivers is that green supply chain management practices are implemented through moral and ethical reasons. (Sajjad et al. 2015; Sajjad at al. 2020).

Other internal drivers such as the involvement of top management and similar different organizational factors are vital for companies utilizing green supply chain management practices. When looking for privately owned companies the company’s founders’ personal values and ideology can be seen throughout the whole company, meaning that a personal commitment can be a great driver for the whole company. Also, management involvement can be defined as a big factor affecting the implementation process. When the implementation has been finished, there has been a positive effect on employee involvement through improvement in operational and environmental aspects. (Walker et al. 2008).

Government regulation and legislation can be defined as major drivers when looking into the external drivers. One aspect that affected companies is the penalties for those who have neglected the regulations, if companies are following the regulations they avoid all penalties, which can be defined as unnecessary costs. It could be stated that the

legislation is the biggest single factor that is affecting the companies' sustainable practices. (Giunipero et al. 2012; Walker et al. 2008).

External competitors can be defined as drivers for green supply chain management practices since competitors want to gain the same position and seek advantages that help them to improve their operations. In short, companies that are implementing green practices in their operations will gain a competitive advantage of some sort. The competitive advantage can be in short, the fact that the company has defined and set the norms and guidelines for sustainable operations within the field they are operating. The fact that a company has defined the norms gains advantages for them and provides them with a position as an environmental innovator. (Giunipero et al. 2012; Walker et al. 2008).

Giunipiero et al. (2012) state that studies have concluded that there are financial benefits when implementing green supply chain management practices. Customers are willing to pay a premium if the product has green labels, and certificates or if the company has for example ISO certification. According to Hebaz & Oulfarsi (2021) financial benefits can be seen from a different point of view. Hebaz & Oulfarsi (2021) state that the implementation of green supply chain management practices is affecting waste management and resource planning, and this positively affects to the company's economic performance and generates higher profits.

According to Micheli et al. (2020) ISO certification can be classified as a green supply chain management driver, that affects the performance of other drivers. One reason to explain this is that when a company holds for example ISO 14001 certificate, they need to also audit their supplies. ISO certification helps companies to influence the whole lifecycle of the product or service. Regarding ISO certification there are also additional national regulations that companies must obey. These national regulations are for example Restriction of Hazardous Substances and Waste Electrical and Electronic Equipment. The purpose of the Waste Electrical and Electronic Equipment is to avert and reduce the amount of electronic and electrical waste. Restriction of Hazardous Substances on the

other hand, sets guidelines for the prohibited elements in the manufacturing process. One example of this is the limitation of the usage of lead in the electronic appliance. (Giunipero et al. 2012)

Customers can be defined as one of the biggest drivers for companies towards implementing green supply chain management practices. Customers might get pressure from their customers i.e. end customers, meaning that customers will affect to company's green supply chain management implementation on several levels. (Walker et al. 2008) Giunipero et al. (2012) also state that customers' knowledge of environmental issues is a driver that guides their purchase behavior toward a greener direction. It could be stated that even the listed drivers are in correlation with each other.

2.1.5 Green supply chain management performance

The need of organizations and industry defines the metrics that are used to measure the green supply chain management performance. Supply chain management is traditionally measured with metrics related to cost, time, quality, and flexibility. When adding a green factor, for example minimizing the waste and emissions to the metrics, it could be defined as a measurement of green supply chain management performance. If a company has internally enough information and knowledge regarding green procedures, green practices, and green requirements the implementation of green supply chain management is a reasonably easy step forward from the traditional supply chain management. (Saeed et al. 2018)

When looking into the green supply chain management performance measurement, it can be seen that at the beginning the investment costs needed for the implementation are not affecting or are even affecting the economic performance negatively, but when looking further into the future, it is clear that the implementation will provide either direct or indirect profits and benefits to the company and its shareholders. (Saeed et al. 2018).

2.2 Green Procurement

Procurement might also sound a lot simpler than it in reality is. Procurement is a vital operation for companies, not even one of the existing companies can operate without procurement. Effective procurement operations include clear strategies and action plans. Effective procurement processes is also constantly monitored. The monitoring of the procurement process needs to be done in many different points of views; all stakeholder's needs to be taken into account without forgetting to follow and keep up with the trends and changes in micro- and macroeconomics related to the sector or industry in question. (Millington, 2020)

Thanks to the people's interest in environmental issues, there has been a huge rise in environmental regulations that are affecting to companies directly and indirectly via stakeholders. Because of these regulations companies are forced to engage green procurement practices in their operations. (Du, et al. 2016)

Even though there has been a rise in environmental regulations, the awareness and due to that interest in environmental issues vary greatly between Western developed economies and developing economies. In developing economies, green procurement can be seen as a completely new innovation. When people face something new or need to adapt new practices, it is nothing else than normal to need time to internalize it. This is also the case with green procurement; developing economies need awareness and education in order to accept, implement, and adapt green procurement principles in their operations and processes. (Etse et al. 2023)

Gosh (2018) on the other hand states that a company's financial performance, operational performance, environmental performance, social performance, and market performance are linked to the adaptation of green practices.

Green purchasing can be generally divided into two different measurements or sections, green purchase intention and to green behavior. Green purchase intention could be stated as a willingness to purchase green services or products. Green purchase intention can thus be stated to consist of customers' motivational factors. On the other hand, green purchase behavior is more like a form of social responsibility, since it has been described to be a form of ethical decision-making. (Joshi & Rahman, 2015)

The knowledge within a company related to environmental issues is affecting internal decision-making processes and affecting in company's decisions and due to this interlinkage green procurement will be implemented. Of course, different primary stakeholders, for example, customers are also conscious of the environmental issues. Collaboration with conscious stakeholders is also a factor that is affecting positively to company's green procurement implementations. Competition is also a great factor when considering the implementation of green procurement. Competitive pressure drives companies in a greener direction in their operations. In addition, support from top management is also found to affect the green implementations in a company's operations. As it could be said, information flows from the top down, so if the top management is interested in the implementation of green procurement practices, the ideology will gradually flow throughout the whole personnel of the company. Lastly, the current legislation and regulations are of course creating the base and direction for the level of green procurement. (Gosh, 2018)

The environment is not the only factor gaining positive outcomes from green purchase contributions. Moser (2015) states that green purchase policies have positive effects on a company's internal and external elements. Green commitment will in the first place help companies to increase profitability and affect market value, employees feel more commitment, and lastly, customers are more satisfied. (Moser, 2015)

2.3 Green service provider selection

As Tate et al. (2012) states ‘’ sustainable companies require sustainable supply networks ‘’ (p. 1) It is vital to also consider the environmental impacts of the supplies, in many cases suppliers are the biggest environmental affect when thinking about the entire production curve from raw material to the final product. If looking for example a company within the automotive industry, that is only responsible for the assembly of the final product, it is clear that the environmental impact of the assembly process is just a friction when compared to the manufacturing of the parts. (Tate et al., 2012)

Green supplier selection is one of the most vital functions that companies can perform. Green supplier selection is needed in order for companies to design, produce, and provide green products and services. The design, producing, and providing of green services and products can be achieved through collaboration and communication between companies and their external suppliers. (Saeed et al. 2018)

Reporting is the best way to follow, recognize, and monitor environmental impacts. Even though the sustainability reporting is not a recent invention, the wider usage has happened only during the last decades. (Milne et al. 2009) For example, Apple published their first supplier sustainability report only in 2011 (Tate et al. 2012, pp. 174).

2.3.1 Green supplier selection methods

Green supplier selection methods can be divided in two main groups, these are multicriteria decision making approach and criteria selection approach. Multi-criteria decision-making approach base can be still divided in two when thinking about the decision-making methodologies. These two groups are individual methodology application and integrated methodology application. Criteria selection on the other hand can also still be divided in two smaller groups based on the criteria. These two subcategories are environmental criteria and traditional criteria. (Govindan et al. 2015)

Figure 2. in below describes the methods and subcategories of green supplier selection.

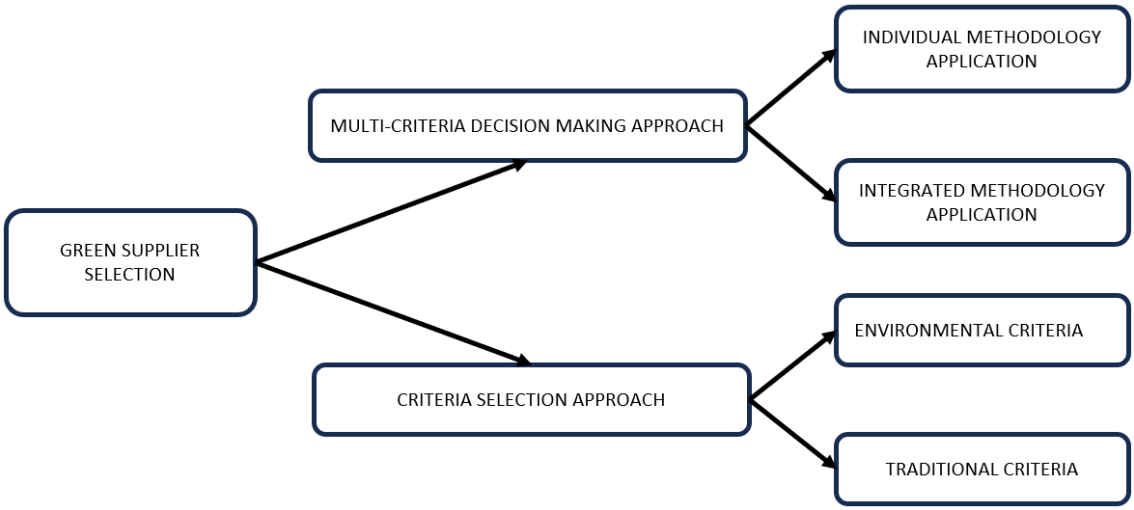

Figure 2. Green supplier selection methods. (Adapted from Govindan et al., 2015, pp.68)

Different researchers are using various theories and methods to examine green supplier selection and its drivers and obstructs. According to Nielsen et al. (2014) the most used methods are Analytic Hierarchy Process, Analytic Network process, Linear programming, and Data Envelopment Analysis. In addition to the above Govindan et al. (2015) adss that mathematical programming and fuzzy decision-making strategies to the list. Gegovska et al. (2020) in the other hand rely on Fuzzy multiple-criteria decision-making methods and artificial neutral networks as dominant methods.

2.3.2 Green supplier selection criteria

Green supplier selection criteria can be divided into two parts, these parts are economic criteria and environmental criteria. Between economic criteria and environmental criteria, economic criteria can be stated to have more effect on green supplier selection. This can be justified by the main ideology of a company, which is the profit maximation for its stakeholders. (Hasemi et al. 2015)

When looking deeper into the economic criteria, according to Hasemi et al. (2015) there are eight different aspects that needs to be considered. These aspects are described below in Figure 3.

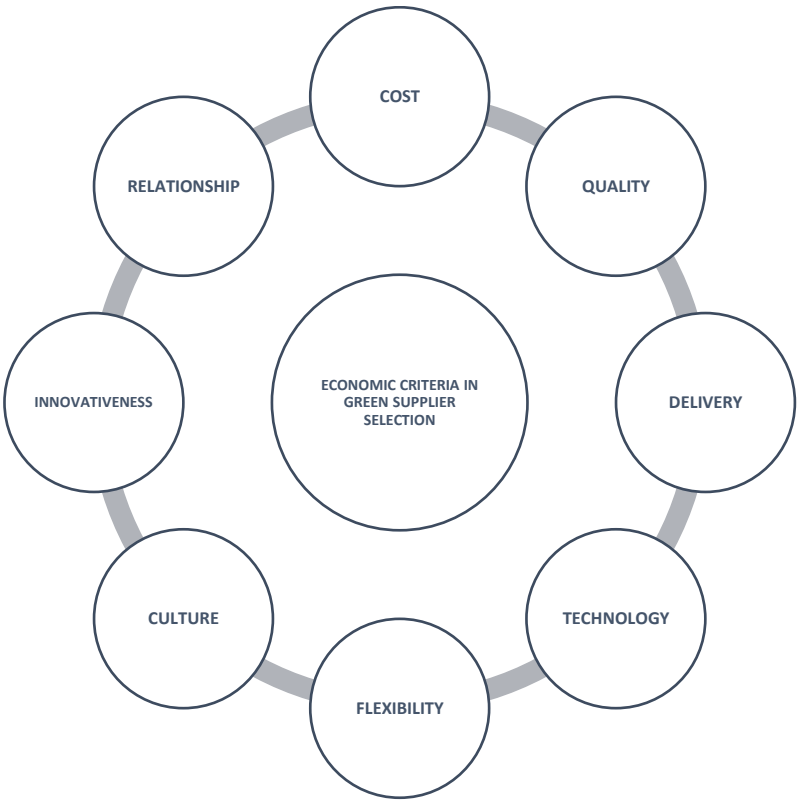

Figure 3. Economic criteria in green supplier selection. (Hashemi et al. 2015)

The eight aspects that figure 3. above shows are cost, quality, delivery, technology, flexibility, culture, innovativeness, and relationship. (Hashemi et al. 2015) According to Gurel et al. (2015) cost, delivery, quality, relationship, and flexibility are the most important aspects.

The aspect of cost can be enlarged and deflated by including different forms of costs in calculations. Purchasing, ordering, transportation, maintenance, and inventory are good examples of costs that needs to be considered. When thinking about the production costs the main element is the raw materials used. Environmentally friendly materials are key to saving the environment and its resources. Environmentally friendly materials can

be sourced and produced in many different ways, and one of them is recycling. By developing the waste management systems, companies are able to minimize the waste and by this affect to costs. Sectorial pricing strategy is vital for companies when determining the costs. The most used supplier evaluation method is the price / performance value, in which the other variable is cost. In conclusion, it could be stated that cost is one of the most vital elements when performing green supplier selection. (Gurel et al. 2015)

Delivery and order fulfillment plays a critical role in green supplier selection. Without functioning logistics and order fulfillment companies lose their advantage in the markets. In short, the process of order fulfillment consists of two sections. The first section is when a client submits the order, and the second section is the delivery of the goods. The order fulfillment time can be referred to as the time between order and delivery. Order fulfillments consist of four key elements, these elements are order fulfillment planning, product execution, distribution management, and cross application integration. Firms cannot rely only on one delivery channel, since changing customer needs and requirements require many different channels in order to respond to the delivery as preferred. (Gurel et al. 2015)

Company policies and customer demands are the base for quality assurance and quality control. One tool to affect the firm quality is to implement quality management in managerial operations. Quality management needs to be implemented in all operations and for all employees from top to down in order to provide functional green general guidelines for companies. (Gurel et al. 2015)

The level of service is crucial for companies to provide the quality products and services to clients according to their demands. The main goal to achieve the respectful level of service is through operational goals. Some goals that affect to service level are for example quick response, high staff morale, and fast deliveries. (Gurel et al. 2015)

Companies cannot perform well in global markets, by themselves, so it could be stated that relationships, strategic alliances, and cooperation are the most vital aspect of the economic criteria in green supplier selection. By strategic alliances companies have common goals and objectives that they are aiming for. Strategic alliances are depending on mutual benefit, so companies have more likely trust and encouragement towards other parties' skills, resources, and strengths. The working together for a common goal produces inter-organizational relationships, which can be considered as really nig advantages in succeeding in the markets. The term external partnership is formed when seller and buyer company have external partnership, that has been created by strategic alliance. By strategic alliances companies have possibilities to develop new skills, share risks and benefits, and share information. In the end it can be stated that strategic alliances are a key for companies to create value for their clients and develop long-term byer-supplier relationship. (Gurel et al. 2015)

Environmental criteria on the other hand have ten different aspects that has effect on the green supplier selection process. The aspects have been presented in the figure 4. below.

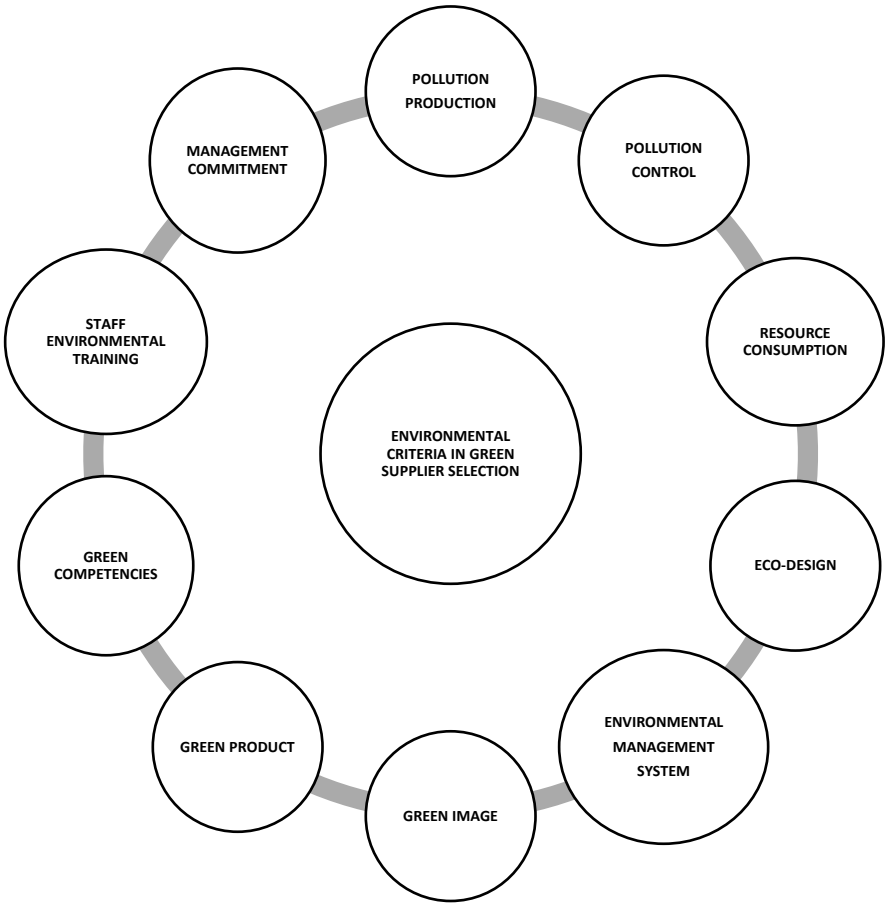

Figure 4. Environmental criteria in green supplier selection. (Hashemi et al. 2015)

These ten aspects that Figure 4. presents are pollution production, pollution control, resource consumption, eco-design, environmental management system, green image, green competencies, green product, staff environmental training, and management commitment. (Hashemi et al. 2015) Gurel et al. (2015) states that the three most important environmental criteria in green supplier selection are environmental management, green product, and pollution control.

In the current world where consumption is on a high level, companies have constantly grown production rates and growing production rates increases the energy consumption. Pollution can be defined as a repercussion of production and its energy usage. Companies have understood that pollution causes not only harm to the environment, but it is also a big expense. Pollution control programs and waste regulations are vital for companies for them to minimize the energy consumption and pollution. (Gurel at al. 2015)

Green product can be defined as a sustainable product that has as low environmental impacts as possible during the whole life cycle of the product. Green products are products that minimize pollution, amount of waste, and usage of hazardous substances, in general, green products are also recyclable. Green products were introduced first in 1964, but their popularity has grown greatly only during the last decades. It could be finalized that consumers buying behavior, effective regulation, and environmental activism has been the driving forces towards companies to produce green products. (Bhardwaj et al. 2020)

Environmental management has gained its place in the procurement process only during the last years. Buyers are all the time more aware of the environment and due to this also force the companies to produce services and products that are in correlation with their values. In order to companies be able to meet the demand as desired they need to adopt environmental management systems. Different directives form the base environmental management systems, these directives are for example energy using products that set the guidelines for environmental impacts for all products using energy. Other valid example is the Restriction of hazardous substance, which main purpose is to preserve the environment and keep the humans safe and healthy by reducing the usage of hazardous chemical, for example to stop the manufacturing of electronic devices containing hazardous materials. As a proof of the implementation and usage of environmental management systems companies can audit their operations and be granted certificates, for example, International Organization for Standardization (ISO) 14001 is a proof for the client that the company is really taking environmental aspects into account in their operations. (Gurel et al. 2015)

2.4 Theoretical Framework

As stated earlier, the literature review has been built on top of three main sections that formed the for the body for the theoretical framework. Figure 5. below shows the theoretical framework for this study.

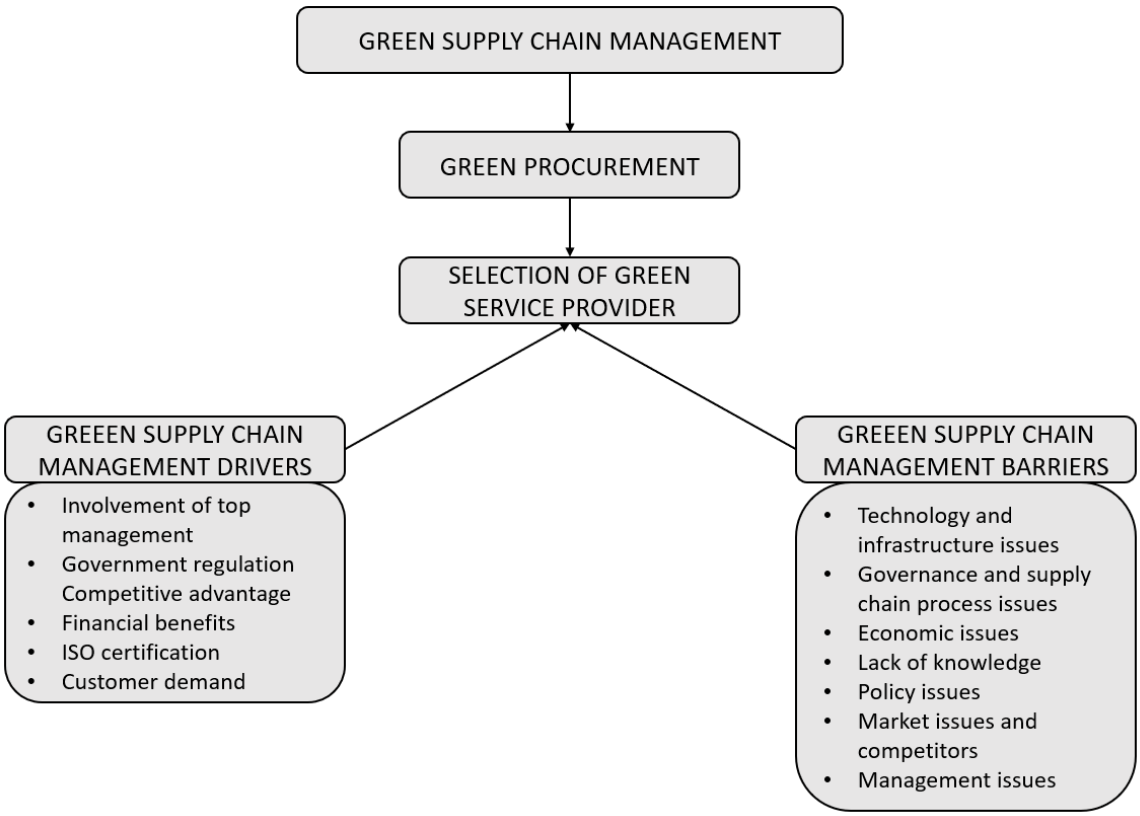

Figure 5. Theoretical framework

The first section, green supply chain management focused on the aspects of internal and external green supply chain management practices. Green supply chain management drivers, barriers, and the performance were also examined. As the Figure 5. above shows, all of the main sections of the literature review have affected to each other and in the end form the fundamentals for the green supply chain management drivers and barriers. The second section, green procurement examined the differences between green purchase intention and green behavior and the influencing factors towards green procurement and its adaptation. Lastly, the third part, green service provider selection explored the green supplier selection methods, drivers, barriers, and both environmental and economic criteria affecting to the selection.

With the help of a theoretical framework, the researcher is able to make conclusions based on existing literature, and studies. Based on the existing studies it can be stated

that the concept of sustainability and in specific environmental sustainability is not a recent invention, but the impacts, importance, and knowledge of it has gained a reputation only during the last years. This has affected to companies' operations greatly and when thinking about the significance and impact of environmental sustainability in service provider selection the following aspects can be concluded from the existing literature and studies.

First of all, the awareness about environmental issues has pushed companies towards adapting different strategies that also include environmental aspects. For example, green supply chain management and green procurement are widely used, this is not only helping the environment, but with the adaptation of green practices companies are able to build up their company image and in the end, this will affect positively to their clients' or end clients' purchase behavior. So, it can be stated that green practices are affecting to companies' environmental-, social-, financial-, operational-, and market performance.

Green procurement and be in short divided into two categories that are green purchase intention and green behavior. When looking into the green purchase intention, it could also be called as a willingness to acquire green products or services. On the other hand, the green behavior can be called also as a form of social responsibility.

When looking deeper into the supply chain management practices, internal management practices can be stated to start from internal environmental management, which builds the foundations for the company's green supply chain management. After internal environmental management companies are looking into Eco-design which can be stated to be the predictive aspect that is taken into consideration before any business functions have been implemented. On the other hand, the external practices that companies are adapting include green purchasing, cooperation with customers, and investment recovery. Green purchasing can be stated to include planning that takes both economic and environmental aspects and different stakeholders into the purchasing process, meaning that the price is not the only aspect when making purchase decisions. Companies have

also been looking for new opportunities and new for products, investment recovery is a perfect example of this, for example, companies might be producing new products from the materials that have been previously kept as waste or for the materials that are left-overs from the production of key products. Lastly, the cooperation with customers is a vital aspect since no one is able to make the big changes alone. When looking deeper into the green supply chain management drivers and barriers it can be concluded that there are seven main barriers and six main drivers. The seven main barriers include the following issues: technology and infrastructure related issues, governance and supply chain process related issues, economic related issues, knowledge related issues, policy related issues, market and competitors related issues and management related issues. On the other hand, the six main drivers include Involvement of top management, government regulation, competitive advantage, financial benefits, ISO certification, and customer demand.

The selection of green service provider can be done by two different selection methods that ate criteria selection approach and multi-criteria decision-making approach. When selecting green suppliers' companies must consider both environmental and economic and environmental criteria. The Economic criteria that companies must consider are cost, quality, delivery, technology, flexibility, culture, innovativeness, and relationship. When looking into the environmental criteria companies must consider, these include pollution production, pollution control, resource consumption, eco-design, environmental management system, green image, green competencies, green product, staff environmental training, and management commitment. Based on the literature the most important of the economic criteria are cost, delivery, quality, relationship, and flexibility, and the most important of the environmental criteria are environmental management, green product, and pollution control.

In the end, it can be concluded that green procurement and green supply chain management including the above-mentioned aspects can be kept as a framework for the selection process of a green service provider.

3 Research design and methodology

This chapter describes how the methods used were selected and how the research was conducted. This chapter also provides information related to the data analysis and research quality including the aspects of reliability and validity.

3.1 Research method

Qualitative research is the key to understanding the phenomenon, i.e., based on it, is possible to create theories, hypotheses, and assumptions about how a phenomenon related to real life works, is structured, or how it behaves. (Kananen, 2015. p. 71) Qualitative research relies on words and images, instead of numbers. Images and words might have more than one meaning, so it is important to clarify and classify the results for analysis. In qualitative research, both mono-method and multimethod studies can be utilized. (Saunders et al., 2023. p. 185.) Qualitative research also describes phenomena better than quantitative research, because in qualitative research the goal is a comprehensive understanding of the phenomenon or object under study describing and creating an in-depth view. In general, qualitative research can be said to aim to find or reveal facts and not so much to verify existing claims or assumptions. (Hirsjärvi et al., 2010. p. 161.)

Since this study aims to understand how green procurement is taken into consideration when choosing external service providers, and what are the drivers and hinders of it, qualitative research can be justified to be a suitable choice as a form of research. The goal of identifying the drivers and hinders for selecting shipping companies for the empirical part supports the choice of qualitative research.

A general problem that often appears in qualitative research is the abundance and diversity of the collected material. The material conducted with qualitative research is video or audio recordings or text, which itself requires further processing before it can be utilized. (Kananen, 2015. p.128-129)

During the data collection phase of qualitative research, the questions are not necessarily asked in the same order or in the same format. As a result, various answers are obtained from the interviews or from the questionnaires. Nevertheless, being different expressions, interviewees are still meaning the same. Expressions from the data collection expressing the same things with different words must be changed into concepts that mean the same thing, i.e., to be abstracted. In practice, abstracting means reducing the answers. (Kananen, 2015)

Kananen (2015) states that either interviews or observation must be carried out in order to collect primary data for the research. According to Smit & Onwuegbuzie (2018) observation can be stated as the most fundamental of all research methods. Observation can be divided in several groups, but the most used dividing is to descriptive observation, focused observation, and selective observation. (Smit & Onwuegbuzie, 2018.)
Interviews are good data collection methods, when studying opinions, behavior, or issues about which not much information has been collected. Interviews are also widely used if the research focuses on the past or the future. There are three different kinds of interviews, structured, semi-structured, and unstructured. Unstructured interviews can be really vogue, these can be almost compared to free discussion. On the other hand, the unstructured interview has strict pre-planned questions, that are asked in the same order from all interviewees. It could be said that a structured interview is a survey-like interview. (Kananen 2015. p.142-145.)

When looking deeper at the unstructured interview, it can still be divided in two, in open interview and in theme interview. As the name implicates, an open interview discusses openly about a certain topic, while a themed interview has pre-planned themes, that are discussed through during the interview. (Kananen 2015. p.142-145.)

3.2 Data collection

The research for this thesis will be conducted by semi-structured interview. This method allows the interviewer to ask important clarifying additional questions but is also makes it easier for the interviewee to answer to the questions, since a more general level discussion on the topic is allowed instead of a precise question and an assumed answer to it. (Galletta et al., 2013). Semi-structured interview usually has pre identified themes around which the interview questions are built. Still, semi-structured interview also allows new themes to arise during the interview and also gives the opportunity to go through them during the interview. (Harvey-Jordan & Long, 2001).

Harwey-Jordan & Long (2001) summarize that the main goal of a semi-structured interview is to gain information on why something is done or working the way it is by utilizing the perspectives, viewpoints, interpretations, and expertise of the interviewee.

3.3 Sample selection

There are two different sampling procedures: Probability sampling and non-probability sampling. This study utilizes non-probability sampling, in more detailed purposive sampling. Purposive sampling is also called as judgemental sampling. Purposive sampling allows to choose a sample that the researcher thinks that are most suitable for the study and that will give as much information and insights as possible. In purposive sampling, the interviewees are selected by evaluating which cases will most probably answer the research question of the study and by this most likely to meet the objectives of the study. (Saunders, et al., 2023. p. 310-325.)

Information about the case company

This study has been conducted for a case company, to give them insights about how clients and possible new clients are selecting shipping companies to carry their cargoes. The case company's clients have been utilized for the sample selection.

The case company is a Finnish shipping company, that has specialized in industrial bulk, recycled materials, raw materials, and demanding project cargoes. Case company operates mainly in Northern Europe and especially in the Baltic and North Sea areas.

In this study, the sample group consists of the companies of the case company's 20 largest customers and the parties responsible for their decision making. There was a total of 6 participants in this study, the participants were selected by purposive sampling. The researcher contacted companies, that he thought were the most suitable ones for the study and might be able to give as comprehensive and accurate answers as possible. All of the participants are working in the companies in a position and the department that select or is taking part in the selection process of shipping companies for their sea transports. The background information for attending companies will be provided in chapter 3.4. In addition to the interview results companies' yearly reports and sustainability reports were utilized as primary sources for data collection and analysis. The webpages of the companies were also utilized.

Below Table 1. shows the industry where interviewed companies are operating in.

COMPANY	INDUSTRY
Company A	Agriculture
Company B	Chemicals
Company C	Recycling and Manufacturing
Company D	Electricity
Company E	Metals and Mining

Table 1. The operating fields of interviewed companies**.**

The interviews were conducted in Teams between 26.03.2024 and 08.4.2024. The time used for each interview varied between 35 minutes and 70 minutes.

The interviews were conducted on the dates and times presented in the Table 2. below

INTERVIEWEE	DATE	TIME
Interviewee 1	26.03.2024	14:00 – 15:00
Interviewee 2	27.03.2024	11:00 – 12:10
Interviewee 3	04.04.2024	14:00 – 14:55
Interviewee 4	05.04.2024	11:00 – 11:45
Interviewee 5	08.04.2024	13:30 – 14:05

Table 2. Interview schedule.

3.4 Background information about the interviewed companies

This chapter provides some basic information related to the five interviewed companies.

Company A is a Swedish-based agricultural cooperative that has operations in over 20 different countries. Company A is a forerunner and leader in food products, agriculture, bioenergy, and machinery in Northern Europe.

Company B is a Norwegian-based world's leading crop nutrition company, that provides agricultural and environmental solutions. Company B has operations in over 60 countries.

Company C is a Finnish market leader and forerunner that handles and recycles glass waste. Company C produces different glass products and raw materials for different needs in a wide range of industries.

Company D is a Finnish based energy company, that has focused its operations mainly in the Nordic countries. In total the company operates in over 10 countries. Company D is among the cleanest companies producing energy solutions in Europe.

Company E is a Swedish-based multinational high-tech metal company that has several mines and smelters in the Nordics and Europe.

3.5 Data analysis

The interviews were conducted in Teams. The interviews were recorded, and to analyze the results the video recordings were transcribed i.e., standardized into one format, which in this case was a text format. Transcribing means converting recordings, for example, audio recordings, or videos into text format whereby their manual processing or processing with different analysis methods or programs is possible. (Kananen, 2015)

The analyzing method chosen for this study was thematic analysis. According to Kiger & Varpio (2020) thematic analysis can be stated to be a suitable analyzing method when the goal is to understand and study behavior, thoughts, or expertise. Thematic analysis can be seen also as a strategy for categorizing the interview results. (Maxwell & Chmiel, 2014). Thematic analysis can be seen as a universal analyzing method in qualitative research, since it can be used with several different research approaches, such as critical realist research approach and constructivist research approach. (Kiger & Varpio, 2020). The themes in thematic analysis can be either inductive or deductive. Inductive thematic analysis can be seen as an applicable and versatile approach. Inductive thematic analysis is an approach where off-topic discussion during the interviews is allowed in order to generate new themes to be utilized. (Kiger & Varpio, 2020; Clinton et al., 2020) On the other hand deductive thematic analysis as used in this study is mostly based on themes that have been formed from literature and existing theories. The goal of deductive thematic analysis is to test and reveal already existing concepts and theories. (Srinivasan et al., 2023).

In thematic analysis, the data is reduced so that only the most important data from the themes are utilized. In addition, with thematic analysis, the data from the data collection stage is categorized, segmented, and summarized in a way that a large-scale and clear description of the subject is possible. Thematic analysis allows the researcher to create

conclusions and thus answer the research questions and achieve the goals set for the research. (Maxwell & Chmiel, 2014).

After transcription and reduction of the interviews, the results were categorized and analyzed in the following sections based on the research guide:

- Green supply chain management
- Green procurement
- Green supplier selection
- Additional themes for empirical research

In this study, the themes included green procurement, green supplier selection, and green supply chain management in the present form and in addition the future, approaches, and the goals. The main themes also included the identification of the drivers, barriers, and criteria that companies have or may have when selecting shipping companies.

When thinking about qualitative research, which this research also represents, the core aspects are the description of people, events, and places. These descriptions can be analyzed with a precise narrative of what has been done and how the results have been reached.

3.6 Research quality

Validity in qualitative research in short means compatibility between descriptions, explanations, and interpretations. It is possible for the author to enhance the reliability of qualitative research by explaining precisely and comprehensively the implementation of the research, its course, and its different vicissitudes. (Hirsjärvi et al., 2010). Eriksson & Kovalainen (2015) states that there are three concepts that provides the foundations for the research analysis that can be utilized in both business research and in social sciences. These three concepts are reliability, validity, and generalizability.

Reliability can be stated to be a measure that measures the extent to which a measure, procedure or instrument can be by other researchers replicated or repeated. Reliability is usually an evaluation criterion utilized by researchers in the field of quantitative research, due to this the aim for qualitative research differs from the aim for quantitative research. (Eriksson & Kovalainen, 2015).

Validity on the other hand can be stated to be a measure that measures the extent to which it is still possible to give a clear representation and interpretation about what happened, based on the conclusions that the researcher can draw from the research that was performed. In short, validity means that the researcher can prove that the findings are accurate and that those can be proven to be true by evidence. Similarly, with reliability, some researchers stated that validity is more of a measurer for quantitative studies. Generalizability in short is a measure that measures the extent of how the results from the research can be trusted in more general situations outside the specific research. Representative samples are the key aspect in quantitative research and on the other hand in qualitative research generalizability is all about a justified selection of research people or research cases. (Eriksson & Kovalainen, 2015)

Eriksson & Kovalainen (2015) stated that in qualitative research the terms validity and reliability are often replaced with the comparable concept of ''*trustworthiness*''. The concept of trustworthiness is also utilized in this study. Trustworthiness can be stated to be the criteria that measures how good qualitative research is. Trustworthiness can be divided into four different aspects, these aspects are dependability, transferability, credibility, and conformability. *Dependability* in the research means that the researcher has presented to the reader all relevant evidence about that the research has been traceable, documented, and logical. (Eriksson & Kovalainen, 2015). Enworo (2023) states that dependability in qualitative research can be done by providing information about the research question, process, and the goals. Also, describing of the research method and research sample are required to increase the dependability. *Transferability* means that the researcher present evidence that the results from the study, or at least part of the

results have similarities and connections with previously made studies. According to Enworo (2023) the choice of sample and the sample technique can increase the transferability of the study. *Credibility* on the other hand means that the researcher has relevant familiarity with the topic, and that there is a link between the results of the study and the observations. The goal of credibility is that other researchers could come to the same conclusions if the study would have been given to them. Lastly, *conformability* in the concept of trustworthiness means that the data used in the research and the results gained from the research are facts, not imagination or made-up claims. This can be proven by linking the results to the theory in a clear, simple, and easy-to-understand manner. (Eriksson & Kovalainen, 2015). Enworo (2023) states that confirmability can be gained through utilizing triangulation and / or reflexivity. Triangulation can be divided into five different forms, the forms are triangulation of methodologies, triangulation of methods, triangulation of data, triangulation of theories, and triangulation of researchers. Member check is also a tool that can be used to improve the quality of a study. Member check in short means that the researcher sends the conclusions made from the research back to the participants for examining, checking, and accepting. (Eriksson & Kovalainen, 2015). Reflexivity in short means that the researcher's assumptions and credence can affect the research. One practical way to prove that this is not the case is to add comprehensive and clear quotations to support the findings.

When looking at the concept of trustworthiness of this study the writer would like to point out the following aspects. Regarding *dependability,* there has been a comprehensive and accurate description about the research process that is one aspect to prove dependability. In addition, the research context including the purpose of the study, research questions, and objectives has been clearly presented. Furthermore, evidence about the selection of research method and sample has also been presented clearly in this study.

Transferability in this study can be proven from the points that the selection of the interviewees has been described, there is information about where and when the interviews were held, and in addition, the interview guide is attached as Appendix 1. Also,

the fact that the results from this study have been linked to the previous studies and the similarities in them proves the transferability. The researcher has made himself familiar with the literature and has linked existing literature and studies to this study in order to increase the *credibility* of the study. Lastly, the *conformability* in this study reflexivity was utilized and the conformability can be proven by presenting comprehensive quotations from the interviews to support the finding. This also proves that the findings and results are not researchers' imagination.

4 Empirical analysis, results, and discussion

In this chapter, the results from the empirical research will be discussed and compared with findings from previous studies with support of the theoretical framework constructed for this study. By this the researcher was able to reveal the contribution between existing research and the research conducted in this thesis.

The main objective of this study was to examine and analyze the significance and impact of environmental sustainability in service provider selection. The goals set for this study were to analyze the importance of green supply chain management, identify the green supply chain management drivers and barriers, define green procurement, and identify the criteria for choosing external service providers, and lastly to identify the drivers, hinders, and criteria for selecting shipping companies based on environmental sustainability. The findings from the empirical study can be used to answer to the research question and to fulfill the goals that were set. So, it can be stated that this study provides evidence for the research question and objectives.

In the following sections the interview results of the five interviews that were held, will be presented, analyzed, and discussed by themes.

4.1 Importance of green supply chain management

The first theme green supply chain management included questions about the importance of sustainability in general, adaptation of green supply chain management practices and the motivators behind that, The future of the importance of green supply chain management, and the affects, barriers, and drivers of the green supply chain management.

Based on the interviews it can be stated that sustainability is an important theme for all of the interviewed companies. Still, even if it is an important theme, not all of the interviewed companies are looking into that aspect when selecting specifically shipping

companies. This correlates with Lee & Lim, 2016., as they have also stated that companies see sustainability as an important theme and that companies are adapting different strategies in order to gain market advantages, build up the corporate image and try to affect to end customers purchasing behavior.

> *'' Sustainability is really important for our company. Climate and nature are one of the core values of our compnay. However, in the selection of shipping company, sustainability is not so big aspect or decision criteria. Still, if I have the possibility I would rather choose more sustainable company, if I would have two options. ''*
> *– Interviewee 1*

> *'' We are directly and indirectly linked to the food chain, so sustainability is automatically an important element. '*
> *- Interviewee 2*

> *'' Of course, sustainability is import for us, it's kind of the backbone of what we do.''*
> *- Interviewee 3*

> *'' At the moment I would say that it is THE topic in our company and in the management - - We are really putting effort in to have the whole supply chain as green as possible.'*
> *- Interviewee 5*

When looking into the *adaptation of green supply chain management practices* in the interviewed companies, it looks that this is a topic that it is taken into account in the companies, but not in all of the departments. Also, identifying or naming the green supply chain management practices was unclear and hard for the respondents. Interviewee 1 did not name any specific green supply chain management practice that they are using, but from the answer, it could be concluded that they are utilizing *Eco-design*. This can also be proven, as Saeed et al. (2018) states that Eco-desing includes pollution preventing, and minimizing the energy usage and emissions.

> *'' We have an own nature and climate program for forming, but for the purchasing department we don't have any own guidelines, only exception are some climate neutral products that we are selling - - In our code of conduct ethical criteria must be filled to be able to work with us.'' -Interviewee 1*

'' There is no target setting yet from the management on maritime section nor on the any other logistic chain.''
-Interviewee 2

I'd say we've got the basics, so we do supplier audits. We've got our own code of conduct that has environmental subjects there as well, and then we've got some more specific things - - maybe not so much on the environmental side, but like sustainability overall - - we include our subcontractors / suppliers in our training, tell how we try to be environmentally sustainable and like do things environmentally safely in our operations.''
-Interviewee 3

''I don't know exactly the terms, but for example you need to pass certain criteria of which sustainability is one part. So, we are adapting these practices, but I can not name them.''
-Interviewee 4

When looking into the answers, the companies that were not able to tell at this what practices they are utilizing told what they are doing, and based on that writer did make some conclusions, since these actions can be seen as internal supply chain management practices.

Interviewee 3 mentioned that their top management is involved, and that they are monitoring and minimizing the waste they generate, and that they are using the production heat to heat up the facilities. So, it can be stated that interviewee 3 is utilizing both internal environmental management and eco-design.

The same is with interviewee 4, they are utilizing production heat to heat up households, and minimizing their own energy usage, so they are practicing Eco – design.

Interviewee 5 stated that sustainability is the number one topic in their management, so it can be concluded that they have built the foundations for green supply chain management based on *internal environmental management*, and based on the actions they are now doing, they are also utilizing the Eco-design. When thinking more about the *external green supply chain management practices* the interviewees are utilizing these, even though they did not know it. Interviewee 3 has started to produce new products from the material, that was classified as a waste before, so, investment recovery is a practice that has been implemented. All of the interviewees are having collaboration with

customers and the interviewees who later state that they are interested or are already buying for example carbon neutral shipments or are in general interested in more sustainable shipping solutions are also utilizing green purchase.

When looking into *the motivators* and the future of green supply chain management practices, customers were a motivator for the most part of the interviewees that are adapting these practices. All of the interviewees mentioned, that in the future these will be more and more important.

> *''There will be some management practices for the maritime section in the future.''*
> *-Interviewee 2*

> *'' Customers is definitely one motivator for the implementation. We also of course have own customers that wants to know how we do and perform as a supplier.''*
> *-Interviewee 3*

> *'' I think that it will be even more strongly involved in our decisions about how we deliver and how de do certain things.''*
> *-Interviewee 5*

Some of the interviewees were not able to describe how green supply chain management is affecting to company and its operations. One mentioned, that since it is not used in their department is not clearly affecting. Interviewee 3 mentioned that current *legislation* is not pushing them to adapt these practices as much as they should. Interviewee 3 stated that this will be changing in the near future due to additional reports that needs most probably to be performed.

> *'' Not clearly, because it is hardly used.''*
> *-Interviewee 1*

> *''It affects the way our company is run really considerably.''*
> *-Interviewee 4*

> *'' Affects in a way, we have started to produce low carbon products, so of course that is putting heavy target and pressure to find solutions to get us as green*

solutions as possible - - of course, there is a lot of regulation, and money is one thing that we need to consider at the end.''
-Interviewee 5

When looking into the green supply chain management barriers *price/costs, regulations and competition* were the most common ones.

'' Price could be one; do we want to pay half as much for transport because it is more ecological?''
-Interviewee 1

'' Competition and competitors will be a big barrier - - regulations will harm domestic EU trade.''
-Interviewee 2

''I'd say if we think about sort of green supply chain that would probably be cost. Then it's like are we willing to pay more on that? Can we still get the same for example for shipping, can we get the same quality, same timeline, and everything with that? So, I'd say cost is first big thing. And then regulation as well.''
-Interviewee 3

''It would be in everyone's interest if regulations and laws were more or less balanced at the world level. It is possible that other countries' "indifference" and looser regulations will have a negative effect on us, that have already done a lot in our field.''
-Interviewee 4

All regulations, which are quite unclear now when thinking mainly the sea transportation. There is a lot of good ideas to use alternative fuels for example, but those are not commercially available. - - Money is always also somewhere there. Our customers have now already committed to pay some extra if they are getting low carbon products. So basically, it is now our turn to put some extra effort to get the green supply that we want to have.''
-Interviewee 5

Interviewee 2 mentioned also that *one barrier is the shipping companies*, the uncertainty of future fuels, and the lack of straightforward investment policy for them.

''The challenge fundamentally is that where do the ship owners invest, which fundamentally are the ones who are going to carry our cargoes and what guidance do they get on the fuel type they have to have or have to use in the future. - - The ship owner must invest for 25-30 years period so if they don't know what they are investing we can of course have a green policy and comply to certain rules, but this will not help if we have no vessels that can achieve the goals. - - Future fuels, such as ammonia and methanol might not be available in a green way in the beginning. So, it will take a long time before you will have the real green product available. - - The is no clear straight forward investment policy for the ship owners and that is a big issue.''
-Interviewee 2

On the other hand, when looking into the green supply chain management *drivers* most of the interviewees named *customer / customer demand and competitive advantage* as a biggest driver. Legislation / regulation and publicity value were also mentioned as drivers.

''Good publicity value is the first one that comes into my mind.''
-Interviewee 1

'' customers would be one. Then the more on the legislation side as well. The increasing transparency and the need to have and need to be able to tell where did you got the service from, what our emissions of the operation and the supply chain. And those are the things that drive it forward. And of course, if the price on being green and being sustainable is hopefully coming down a bit continuously, then that'll make it more available for businesses to choose that option too.''
-Interviewee 3

''Of course, the fact that there is a lot to do in the field of the environment in general. And especially regarding the CO2 issue, because it is a global problem. Much has been done, but much remains to be done. The environment has an important position in our company. In terms of CO2, we are almost clean, but our competitors in Sweden and Norway are even cleaner. Regulations and customer interest could therefore be the biggest drivers.''
-Interviewee 4

''Customer demand and competitive advantage are some of the drivers. First, I would say that it is our willingness to do things and work towards the goal to be as green and as environmentally friendly as possible in our daily operations and the at the second comes customers. Customers are really aware what is going on in the world and some of them are even making and putting up new requirements for us.

production so the supply chain will also be included and will come automatically up in the process.''
-Interviewee 5

All the of the above-mentioned green supply chain management barriers can be added to the seven different categories that Kumar & Joji (2023.) have stated. On the other hand, the green supply chain management drivers can be classified as per the six factors stated by Giunipiero et al (2012).

4.2 Green procurement

The next theme, green procurement included general questions related *the importance of sustainability and its relationship between profitability and effectiveness*. Also, the importance of environmental regulation in shipping was discussed. Lasty, the adaptation of green procurement in the interviewed companies was also discussed.

When looking into the relationship between profitability, effectiveness, and sustainability, there were quite variable answers. 3 out of five said that they go hand in hand, one mentioned that sustainability is the most important and the remaining one interviewee stated that money comes first.

'' Sustainability is the most important one.''
-Interviewee 1

''All of the three goes together.''
-Interviewee 2

'' - - I'd say that unfortunately last is the environmental and other aspects that are kind of seen as a plus.''
-Interviewee 3

''All of these are going hand in hand.''
-Interviewee 4

''Of course, profitability is there, we need to keep the company going on, but still sustainability is part of our everyday life; what we do, how we think, how we

consider to go further. But in the end, I would say that all of these three are going in a way hand to hand.''
-Interviewee 5

As Du, et al. (2016) stated the companies are forced to engage green procurement practices in their operations due to several external influencing factors. As the interview results prove, four out of five were interested in this. Moser (2015) stated that green purchase contributions are not only positive for the environment but also for the profitability, customers, employees, and market value. This statement can also be proven to be accurate based on the results the writer received from these interviews.

When looking into the opinions about the importance of environmental regulations in shipping interviewees agreed that the regulations are important. One interviewee replied that those are already on a good level, one mentioned that those should be even more strict and in addition three of the five interviewees mentioned that currently the regulations are unclear and hard to understand.

'' Environmental regulations in shipping are extremely important.''
-Interviewee 1

'' Those are important, but the most important thing is to look at the feasibility of the regulations. For example, now shipowners have been forced to adapt ballast water treatment systems and no one have thought about how it is in real life working. In UK with some ports the water is too muddy for these to be operated, so vessels must shift the systems off. So, you can nicely force shipowner to make changes but what really is the necessity and clear approach for the regulation. - - Also, people can buy certificates, but what really is behind the certificate? For example, we can look for blue or green suppliers, but they are not able to provide the origin of the material. - - If you must import your ''green fuel'' for example outside of Europe and then use it in Europe, it does not make any sense. Yes, it is green in a way, but when looking the big picture it is not.''
-Interviewee 2

'' Yes, those are important, but if you think about the sea areas surrounded by Finland, I think that the strictness is already on a sufficient level.''
-Interviewee 4

'' I see that the environmental regulations in shipping are important. Somehow, I think that those cold be even more strict but at the moment main concern is that those should be more clear. I think that we all who are having something to do with shipping, we are really struggling to understand what to do, how to do and what is the meaning at the end.''
-Interviewee 5

The last question in this theme was about the adaptation of green procurement and the involvement of top management. Two of the interviewees mentioned that top management is highly involved. Three mentioned the code of conduct and the selection process to be accepted as their supplier as an adaptation practice of green procurement.

'' We don't have any direct adaptation practices.''
-Interviewee 1

'' There is a number of steps: Do we use these ships in an optimal way. Do we always utilize the total capacity of the ship or are we going to sail empty. Should we use younger ship that uses 4tons versus older one that used 8 tons of fuel. So, there a lot of options to at least towards transporting the cargoes in a greener way that what we are now doing.''
-Interviewee 2

''We have different kind of environmentally friendly packages that we are using and then we have our code of conduct. - - Top-management is very much involved. It does sort of touch up on everyone and every department.''
-Interviewee 3

'' the fact that you can get on our short list, i.e. the so-called potential accepted suppliers list, already requires that the supplier/shipping company has green issues/aspects taken care of.''
-Interviewee 4

'' Yes, we send a questionnaire to our customers when forming new relationships, but also, we are following all our customers on a regular basis, how they are doing and how they handle our materials. We require our suppliers to report all the emissions to us. Our top management is involved in these aspects, and they are also highly interested.''
-Interviewee 5

Based on the interviews, it can be stated that interviewee 1 has only green purchase intention as the other companies are performing green purchase behavior.

4.3 Green supplier selection

The third theme, green supplier selection included discussion about the general procedures regarding selecting shipping companies. This theme also included questions about the decision-making criteria used when selecting shipping companies. In addition, the economic and environmental selection criteria were brought up and reviewed. Lasty, interviewees presented their opinions about whether environmentally friendly transport can cost more compared to normal, and if using alternative fuels or using a vessel that consumes less bunkers can be seen as an advantage or significant from the company's point of view.

As Lee & Lim (2016) concluded green practices have a big effect on a company's reputation and image. Based on their survey, a positive image of a company's environmental management has in the end directly affected to consumers purchasing behavior. The same results can be found in this study.

> *''We are looking for good customer service and flexibility. I would also like to point out that reliability and price-quality ratio are also influencing factors that we take into consideration in our selection process.''*
> *-Interviewee 1*

> *''There is clear policy internally : we have to have better performing ships, we have to make sure that we complete the ships fully, we are looking for in and outbound combinations, we are looking for different possibilities, for example virtual arrival possibility, so that we are not consuming unnecessary fuels to have the vessels wait at the ports.''*
> *-Interviewee 2*

> *''First ting that we are looking at is the price. Also, we value long term partnership, and we value flexibility. With case company we value that you can control your own port and we can load and discharge seven days a week. So, I would say that the second is ease of working and the flexibility of working. In the long rung it saves a*

lot of working hours if we are not having continual mistakes, continual delays at the port, we are not able to change order for customers in the long run this would cost us a lot more than saving a let's say 0,5€ per ton. Spot market for us is the final result if everything else fails.
-Interviewee 3

In order to get on the short list, our accepted suppliers list: the finances must be in order, the company must be reliable, the ownership basis will be checked, and the fact that one must not deal with crooks will be checked. In the Suppliers code of conduct, the supplier is reviewed in its other aspects. In order to "get through" this, you must A: be well informed about things and company must ride at the industry's wave crest, and B: everything in the company must also be in order. So, basically, we don't have any procedures for the selection, we only contract with companies that are accepted in our short list. Once supplier is accepted to our short list we can select them.
-Interviewee 4

I think that all industries are having certain requirements, it is part of starting a new relationship with new supplier. There will of course be business related checks, but these environmental aspects are also coming more and more in this picture. of course, companies have to show some reliability and records about how they treat their business, and how they treat their organization. Related to the selection of shipping companies we also want to get some records of how they treat their vessels.''
-Interviewee 5

When looking into how interviewed companies are selecting shipping companies, there were variable answers. As a conclusion, it could be stated that flexibility, customer service, price – quality ratio, and reliability were the most important aspects when selecting shipping companies.

When thinking about the interviewed companies and their decision-making criteria it can be seen that all of the companies are looking at both environmental and economic decision-making criteria.

'' We are using both economic and environmental.''
-Interviewee 1

'' Both environmental and economic decision-making criteria are used.''
-Interviewee 2

''Mostly economic criteria, but environmental criteria are also used.''
-Interviewee 3

'' Economic and environmental criteria will be thought about when selecting companies to our shirt list.''
-Interviewee 4

'' It can be stated that both economic and environmental aspects will be considered. Innovativeness is really important thing for us in the selection process. We also need to see that the companies have in a way good fleet, large enough fleet, and of course based on our location we need to this so to say Nordic regulations ice class fleet.
-Interviewee 5

Govindan et al. (2015) stated that companies must select the suppliers either by a multi-criteria decision-making approach or by a criteria-selecting approach. As the companies are making the decision case by case and the reason behind the selection varies, it can be stated that *both the multi-criteria decision-making approach and criteria-selecting approach are in fact utilized in all of the interviewed companies.*

As mentioned during the previous questions companies were mostly utilizing cost quality and flexibility as the most important economic criteria when choosing shipping companies. Interviewee 1 mentioned that they have a bit different guidelines in different countries for the selection criteria that needs to be taken into consideration.

''The company's departments in other countries have different operating models. For example, in Sweden, price has a greater effect than in Finland.''
-Interviewee 1

'' Cost, quality, and flexibility are mostly taken into consideration.''
-Interviewee 2

''Cost, quality, relationship, and flexibility are criteria's that are taken into consideration. Also, demurrage, how quickly you load and unload and how many ice-class

vessel do you have been taken into consideration. We want to know if your vessels are suitable in UK tide ports. We need the flexibility and variety of the fleet.''
-Interviewee 3

It was important to see that interviewee 5 mentioned that they require Nordic ice-class vessels, but for example, interviewee 3 mentioned that they are also interested in no ice-class vessels due to their suitability in tide affecting ports. Also, interviewee 2 mentioned that a uniform and identical fleet would be their wish and it would help them to optimize their operations and volumes. The economic green supplier selection criteria that the interviewees mentioned are in line with the ones that Hashemi et al (2015) have presented.

Interviewees did not mention any specific aspects related to environmental criteria. Interviewee 3 mentioned that geography and location are also aspects that must be considered when selecting suppliers. Still, from the interviews, it can be concluded that several environmental criteria as per Hashemi et al. (2015) are utilized. For example, staff environmental training, pollution control, eco-design, green image, and green products are environmental criteria's that companies are, despite the naming difficulties utilizing.

When speaking about the possibility of environmentally friendly transport costing more compared to normal and if the fuel consumption of the vessel carrying interviewees' cargoes would be significantly lower clear differences could be observed in the answers. Some said that it can be more costly, some said that it cannot cost more, and some gave quite neutral and round answers.

''With marketing in mind, higher costs would be acceptable. Transportation is a big part of the costs, so in percentage terms the difference should not be significant. How much more money they we willing to put into transportation is still a bit open. A positive public image is a big motivator to be willing to pay more. I could say that 5-10% more expensive would be ok. We are involved in several cross-sector initiatives, where players come together for a more responsible supply chain. In sweden we have a Responsible shipping initiative (RSI) that is a co-operation between sea transport byers in Sweden aiming for better environment, working conditions and safety onboard sea freights in the Baltic and North Sea. So, here we can see that in

Sweden there is a lot of more input into these matters that what we have in Finland.''
-Interviewee 1

''Simple answer: everything what we do and everything what is called green will be more expensive. So, the consumer at the end are the ones that will pay the price.''
-Interviewee 2

''At the moment we don't have any criteria or any guideline on can environmentally friendly cost more. This is something that is now being talked about. Our top management is now thinking about these and then giving us some clear guidelines how to operate. - - The saving from the fuel use with internal shipments of foam glass - - that supports the production in Sweden and Norway could be a useful factor, but then the carbon footprint would have to be demanded to be more accurately calculated in these countries. Then it would rather be calculating the footprint of the whole product, not just the raw materials.''
-Interviewee 3

''If it has a significant advantage compared to others, it will understandably cost more. Of course, the price is also a very important aspect. A higher price could be acceptable if there was something concrete to show clearly. We should show customers that this has been done, etc. Customer acquisition and marketing advantage could have an impact on the decision to pay more. Also, competitors are one factor that will in the end affect to these kinds of decisions. - - Green alternatives in our field are more the norm than the exception, it is challenging to stand out in a better direction, but when going in a worse direction, the differences are highlighted. A possible acceptable percentage difference in price cannot really be set. It's case by case. The changing market etc. affect the decision.''
-Interviewee 4

''In a way I think that we feel that yes, that can be more costly, but also, then we are in a way trying to understand what good thing this is giving us and supplier as well if we have a nice working system which we can say that it is really sustainable set up. About how much more expensive: It is really hard to say. It is depending on the case. Currently we are having some cases where we have committed to pay extra to have more sustainable solution.''
-Interviewee 5

As Moser (2015) states, it is hard to know if customers' green attitudes and goals are in line with their green ideology and processes. This could also be seen from the interviews.

With some interviewees, there was a green attitude and willingness to affect to the processes, but still, it could not be more expensive.

The question of whether using carbon neutral alternative fuel instead of regular fuel can be seen as an advantage was pretty much along the same lines as the previous answers. Interviewee 1 said that it of course would be a nice thing to say, but they are not able to give any exact percentage of how much more they are willing to pay more. Interviewee 2 mentioned that at the moment it is a bit tricky situation and currently there is no benefit for them in using more expensive alternative fuels.

> *'' There is no benefit at this moment, if you will try to sell it as a green or non-green because if your customer does not care about it, it is difficult to look into it. The total supply chain must change. At the moment, there is no payment internationally, if we look into at it in a global perspective, for example, if we have a customer in Argentina that does not care about where and how it is coming from it does not work. You must look it from the different angles. When looking into international level, the answer is at the moment no. At the moment in the European level, we don't see any examples where is going to pay off. We have been having trials with green solutions but those have not being paying off.''*
> *-Interviewee 2*

Interviewee 3 mentioned that they would like to say that they are using green solutions, but they don't unfortunately have any willingness from the customer side to invest in these solutions.

> *'' We would of course like to say that to our customers but at the moment we don't have any guideline or willingness from the customer side, but it his would be another thing yes, we would be really glad to say that the transportation has been made with carbon neutral fuels.''*
> *-Interviewee 3*

Lastly, interviewee 4 and interviewee 5 mentioned that they are interested in these carbon neutral alternatives, and less fuel-consuming alternatives but they are not able to give any guidelines about how much more it could cost.

4.4 Additional themes

The last part of the interview, additional themes included a question regarding green reporting tools, goals towards environmental efficiency, responsibility in terms of shipping company, emissions trading, customers' perceptions towards environmentally friendly or carbon-neutral transports, benefits of using low carbon or carbon neutral shipments and general questions regarding case company and the perceptions and attraction towards it.

When asked about the green reporting tools that companies are currently using, it was hard for some of the interviewees to name them.

> *'' We are utilizing GRI report, the global reporting initiative.''*
> *-Interviewee 1*

> *'' The main now is the footprint and how it can be improved in each individual level. There is no direct measurement in place on that field yet for the sipping sector.''*
> *-Interviewee 2*

> *'' The carbon footprint is one that we are using. Also, we monitor overall, what ''normal'' waste and hazardous waste we have in our operations. We also have the overall environmental footprint for our product. So, it is not just the emissions, it includes also like biodiversity loss and water consumption. All of that is included in that as well.''*
> *-Interviewee 3*

> *'' I know there are some, but I can't name them more precisely.''*
> *-Interviewee 4*

> *'' There we are just in a way at beginning of the process. Last year we hired a lot of professionals who have knowledge and have worked with environmental questions and especially with sustainability. So, we have now a team for our group to find the tools for us and have some kind of unitized reporting system for us. But unfortunately, we are not there yet.''*
> *-Interviewee 5*

Based on these interviews it can be stated that some companies should have clearer and more comprehensive internal information flow regarding reporting tools they are using and regarding sustainability matters in general. The question was also not so well formed, since as Tate, et al. (2012) states that sustainability reports are also a form of green reporting tools, and when looking from the companies' yearly reports, all of them have sustainability reports made on a yearly basis.

When looking into the goals for companies to improve their environmental efficiency there was again a lot of diversity in the replies. Two of the companies had clear targets and three did not have.

> *'' There are no targets as such set at this moment. Not at least on transport side.''*
> *-Interviewee 2*

> *''Yes, we actually have. We do sustainability report annually and the targets are there. We are currently trying to save up to 5% energy used to produce a cubic meter or a ton of certain products. In addition, then we are trying to minimize the amount of waste, with one of our products we don't basically have waste in the production operations. We also have a target of our own carbon neutrality.''*
> *-Interviewee 3*

> *''We have the scope 3 requirements, like that all our suppliers that are having a contract with us are due to report those emissions. Those reporting's are seen as services towards us, and we are following and monitoring the emissions. We are also comparing suppliers from similar business, how they do, and we are in involved us in plenty of global and international societies in our area. So, we are getting all the time more of this background information, so that we can see that hoe good or how bad we are doing some certain things.''*
> *-Interviewee 5*

The utilization of production waste heat came up for two interviewees. In my opinion, this use and the efficiency of increasing use could also be described as goals for increasing environmental efficiency. And, as said before, and as stated by Saeed et al. (2018) these are also green supply chain management practices.

The next question was about how the interviewees see a sustainable shipping company and what it is like. Some main points that were raised during the interviews were to have safe vessels that have clear protocols about how to proceed if some accidents occur, developing or working towards a lower carbon footprint and alternative fuels, transparent reporting and external validations, responsible handling of hull cleaning water, and competent crew.

'' Safe ships, that has protocols for possible accidents. We don't want to see incompetent incident handling and for example see that vessels oils are immediately spilling into sea. Durable ships and competent personnel are also aspects of environmentally friendly shipping company. Environmentally shipping company does not pump out waste, or waste waters into the sea. Also, it is important that vessels monitor the current situation in the port and adjust the speed based on that, Ships could come more slowly to save fuel. I would be willing to endure longer delivery times at the expense of saving fuel.''
-Interviewee 1

'' Owners must first figure out how they can be emission neutral or free. Neutrality is an easy goal, since that can be achieved with certificates. When looking into deeper the issue is that where can shipping company get a clean green fuel. Will there be even a saving in the shipping when looking at the big picture; if you need to transport for example ammonia from Spain to Finland, will it at the end, be more sustainable solution than using traditional locally available MGO, even if you have the certificate that states that your vessel is running with green fuels. - - And when looking into the future, there will never be enough alternative fuels to substitute the MGO used today. So, there will be always a mixture situation, let's say 20% of x and the rest of y. And the bigger the ship is the easier the costs of adapting new fuels or consuming more than one fuel can be carried. When looking the accommodation possibilities of different fuels big vessels and big shipowners can carry these costs easier than small ones.''
-Interviewee 2

''Environmentally friendly shipping company is developing or working towards a lower carbon footprint and an alternative fuel, I think that these are major aspects when working towards the net zero target. Wastewater treatment is also a crucial aspect, including hull cleaning water and its responsible disposal. We would like to a high-quality service with responsible handling of any waste that hull cleaning for our cargoes produces. In addition, transparent reporting and external validations are also a proof of environmentally responsible company. Lastly, environmental labels / certifications could show the customer that things are done correctly.''
-Interviewee 3

''In short, your company is a great example of environmentally friendly shipping company.''
-Interviewee 4

''They have a really clean, empty record that they have not caused any environmental related cases / situations, those are things that we are following, and we are also asking suppliers to report them to us. The vessels are not having any kind of port state reports with plenty of notices about missing this and that and going this and that incorrectly. The fact that how shipping companies work is also kind of a proof on environmentally friendliness, we have some examples when owners' vessels have not behaved. So, we clearly have the understanding that we are not using them anymore, or least we are putting certain periods. We are really following how shipping companies are doing even outside of our business, we are interested also about what they are doing with others. And it is not only shipment related, but we are also having/doing the same with all suppliers that have a contract with us.''
-Interviewee 5

All of the interviewees said that the case company is in their opinion an environmentally friendly shipping company, that is doing its utmost from the point of view of the environment.

Next interviewees were asked to compare the case company with other shipping companies or competitors.

''Not much of a basis for comparison, because we only use you Finland and I am not taking part in selection of carriers in other countries.''
-Interviewee 1

''It is important for all companies to decide where do I want to be, what can I be and how do I get there. We see that the companies that are controlling the whole fleet by themselves not just operating the vessels are in a winning position. It is also important to have the ability to get the vessels that are needed in the future. We want to work with real ship owners. There are several reasons to this, the main ones are information flow and knowledge. Knowledge where the ship is, how it is doing, what ships are you going to build in the future, how are you going to operate them and how efficiency are you running your ships. We also want to know for a longer period what size of vessels we will have and like this optimize our processes. If you are only a operator you are dependent on others, and then we don't really

know what vessels we will have available in three years. - - It's better to have that line to the direct ship owner because the direct ship owner is investing for longer period in those ships. That means that automatically you can make long term agreements. It's very difficult for us to make a contract with an operator of which we don't know, what type of ship will he have in two or three-year time. - - And then automatically you can link all the green elements connected to that, because what we do now with the majority of the shipowners is to look, what ships are you building? What ship size are you building? What fuel types do you have in mind? And then of course, we can adapt our green policies partly to that.''
-Interviewee 2

''Currently there is no other company that we are working with that offers a biofuel or a lower carbon fuel substitute. So, you seem to be ahead of all the other competitors in the bulk shipping industry. Plus, obviously flexibility being a local service, that's going to have less impact on the environment if we can keep things as local as possible. We don't want to get into the situation where we will have a vessel sailing empty from the south of Spain just to pick up our glass and do a short shipment. - - We prefer to use 3000 – 4000 tonners and do the shipments locally.''
-Interviewee 3

''You are in our short list and the intention s to continue working with you in the future. As said before, standing out on our suppliers list is really hard. Other shipping companies also offer green service-oriented solutions. In short, your actions and operating models have been good.''
-Interviewee 4

'' I think that case company is really capable to make changes, they are following what they are doing, and they are having good communication with their customers. Case company is also a really honest company, if there is something that they cannot perform, or something that is really hard for them they are not afraid to tell that. I think that they are really taking care of their customers.''
-Interviewee 5

From this question, it can be stated that all of the participants were pleased with the collaboration with the case company and are also going to work with them in the future. Interviewed also thought the case company is a customer-oriented company that really cares about their customers and also about nature, not just the figures below line.

In this theme, the interviewees were also asked whether they are taking part in emissions trading or not. Four of the five were taking part in the emissions trading.

Interviewee 2 mentioned that they are not doing it actively and it is not their intention to start doing it more actively.

Interviewees were asked if they think that their customers appreciate the fact that the products have been transported in a more environmentally friendly way or carbon neutral way, they were also asked if this would be something worth mentioning when they are selling their products. With these questions, there was a clear difference in the answers. Two interviewees mentioned that they think that their customers would appreciate it but that they are not willing to pay for it. One mentioned that some of their clients are interested and some are not interested in paying more for more environmentally friendly transport.

''In short, yes.''
-Interviewee 1

'' Yes, and I can see this as a marketing advantage. In our branch the market is driven until a certain level by the end product. So, if we have discussion with bigger food producers then of course automatically the question from their side is that what is your footprint in your products At the moment we are not anymore, a traditional fertilizer producer as a such. We are already producing a lot of decarbonizing products and products do reduce emissions. There are a lot of products we do already to reduce emissions with other companies. We have number of products which are automatically helping the world to have a less emissions already to be put in in the air. So this is already partly a trend, so we develop more products are suitable to help the world to live forward and not only being a fertilizer producer.''
-Interviewee 2

''Yes, of course, but the willingness to pay for it is as different thing. Construction sites are going to be more green, so in future this might be more and more important due to visibility in construction projects.''
-Interviewee 3

''Yes, this is an advantage in marketing and sales to the end customer.''
-Interviewee 4

''Some are interested, and some are not. Some are even interested to pay little bit more than normal product if available. We have of course all certificates that our low carbon products are produced with using green raw materials, so the sipping part should also be as green as possible.''
-Interviewee 5

In addition to the previous question, interviewees were also asked if there would be advantages or benefits for them from using carbon-neutral or low-carbon shipments. These responses correlated with the previous answers. Interviewees mentioned that this could be seen as a boost for marketing image and marketing benefit. Also, it would help them to sell the products to the end client. One interviewee also pointed out the aspect of carbon balance.

Interviewee 1 stated that there would be an advantage from the point of view of marketing and sales. Interviewee 2 mentioned that it is hard to say, since emissions trading might modify the current operating models and that companies need to re-evaluate whether to use rail, sea, land, or air logistics. Interviewee 2 also mentioned that of course there will be a trend with low carbon or carbon neutral shipments but at the moment it is still on a low level. Interviewee 3 also stated the marketing image as a biggest benefit but also highlighted that they are not doing this for marketing, they are doing it because they want to be a more environmentally friendly company. Again, with interviewee 4, marketing advantage and sales were highlighted as the biggest advantage. Interviewee 4 also highlighted and said that it has to be remembered that their industry is already really environmentally friendly and green-driven, so only using more environmentally friendly transports won't make a big difference. Lastly, Interviewee 5 pointed out marketing image, marketing benefit, and carbon balance as advantages. Interviewee 5 mentioned that this is important for their company, and that the usage of green transportation methods is also giving benefits for them. They hope, that at some point, they are able to tell their clients that their whole supply chain is low carbon, or even zero carbon. Interviewee 5 also mentioned that they made a questionnaire for their suppliers about what green innovations or solutions they could offer. They received a plenty of responses and are already implementing some of these.

The next question that was presented during the interview was if environmental sustainability certifications have effect when interviewees company is choosing shipping companies. With this question, there was a lot of variation.

''It is not the main aspect on the decision-making process. We operate under good trading practice, meaning, that we operate under the certificates ourselves. Based on these certificates under which we are operating we have instructions on what kind of companies we can use. In short, it matters what certificates the transport company has.''
-Interviewee 1

''We start to look for the carriers by looking that who is building new ships. - - and these new ships are consuming approximately 4-5 tons diesel per day. Do we want to use these ships or the current ones that are consuming 8 or 9 tons. By using those newer ships, you basically reduce your emission already by 50%. So, the perspective of who do you select as a shipping company with us is that we are focusing on those who have newer ships. You don't try to stay with people who have only ships of 20-30 years old. That is an easy way to reduce emissions. The second this is of course to select a company that will have a series of the same kind of ships because it is much easier to work with one shipowner who has 20 ships which are all identical to each other compared to a shipowner who has 20 vessels that are all completely different type of ships, because then you cannot optimize your intake and production. The easiest would be to have one shipowner with identical ships that are low fuel consuming - that is your ideal partner.''
-Interviewee 2

''Currently we don't have sort of principles on how that should affect to the decisions. It must also be noted that for example ISO certificates are quite specific, but then there are a lot of so to say general certificates. The people doing the purchase or selecting the shipping company must also have the knowledge what all those certificates really means and proves.''
-Interviewee 3

''Weight value in accordance with the code of conduct. At least it hasn't prevented cooperation.''
-Interview 4

'' Yes, and it will be even more hard requirement for our suppliers in the future.''
-Interviewee 5

From these responses, it can be stated that these sustainability certificates are not necessary factors on which the selection of shipping company is based on, but rather a major advantage. These responses differ from the research findings from previous articles, Giunipiero et al. (2012) found that companies tend to pay premium and tend to select companies that have ISO certificates. Gurel et al. (2015) have highlighted the same aspects with interviewee 3, ISO certificates are specific, and in order to get granted for them, audits must be carried out. Gurel et al. (2015) also point out, like interviewee 3 that buyers need to know all the certificates mean and what is behind them.

The last five questions of the interview were related directly to the case company and interviewees' perceptions and commitment towards it.

Firs of these questions was about how the case company's environmental responsibility activities influence interviewees perceptions of the case company as a shipping company.

> *''I have noticed the activities and those have affected positively to the company image that I have. Those have also raised the image of case company being a green company.''*
> *-Interviewee 1*

> *'' Of course, it is always a good thing to see that people are trying to develop things and trying to be a front runner on a certain element. The main problem is of course that we are still very much focused on cost and again players in the international environment are not thinking too much about the greener solutions. The other element that remains is that if a company has a variety of many types of ships but there is no common driver, meaning that there are bigger, smaller, and middle size vessels, it makes it difficult for us to increase the volumes which we have. We know that there is a green drive in the company.*
> *-Interviewee 2*

> *''It projects a very good image, it projects a responsible image, it projects an image that case company is not just profit driven. It generates an image that case company provides a high-level service, and it also predicts that case company is an ethical company that will work with us in an ethical way. So, if you treat environment with responsibility, we hope that you will treat your customer in a similar responsible way. It projects a positive responsible image. In shipping there is a lot of potential for mishaps and accidents, and these responsible actions also gives the*

image that you are able to minimize those. In addition, it gives an image that environmental responsibility is important for you, and you are developing it.''
-Interviewee 3

''It has not been necessary to pay much attention, because it is known that things have been handled sensibly. These actions have also had a positive impact on the general image.''
-Interviewee 4

''It has affected to the image of the company. I think that the green concepts that you are offering are really interesting.
-Interviewee 5

Based on the responses it can be stated that the case company's environmental responsibility activities have positively affected to all respondent's perceptions of the case company as a shipping company. Similar results were founded by Giunipiero et al. (2012) and Walker et al. (2008). They have both also found that environmental responsibility activities can generate a position as an environmental innovator, which makes the company interesting and desirable by the clients.

The next question was about if these environmental responsibility activities impact the commitment to select the case company as a shipping company. Only one of the interviewees mentioned that these activities have affected to the commitment. The last four interviewees on the other hand stated that these activities do not affect to the commitment or selection of the case company as a shipping company.

''Not directly affecting, but we still hope that environmental and ecological values will be important also in the future.''
-Interviewee 1

''From a perspective of how we handle and act the answer is no, those have not affected.''
-Interviewee 2

'' When looking into the future, if it is only a bidding war and it's just on price then it's a big pool and that is one way to go. You are adding value to you as a partner,

not only are you local, you are Finnish, you are on our doorstep, you provide a good service, we have a long relationship, but it also shows that you are in a way future proofing your business. So, I would say that with these activities you are adding value to what you are, and it is making you a more natural partner for us in the future. We are not looking that oh, all your ships are getting older, and they are a lot of smaller than all the vessels on the market. You are actually showing that you are looking towards the future and if we work with you as partners there's going to be extra benefits and you can bring value to us and we can bring value to you at the same time.''
-Interviewee 3

''Doesn't necessarily have a direct impact on the selection, but it has had a positive impact on the general image.''
-Interviewee 4

''I would say that yes, those have affected.''
-Interviewee 5

The next question was about if the case company's environmental responsibility activities influence the interviewee's attraction towards the company. With this question, interviewees gave similar responses as to the the question about how these environmental responsibility activities influence the perceptions towards the case company. So, it can be stated that these activities have positively affected to the attractiveness of the case company.

In the second last question, interviewees were asked how the case company could enhance its environmental responsibility efforts. The most common suggestion was that the case company should have more vessels that are able to burn bio-oil. The possibility to connect the vessel to shore power was also lifted up. One interviewee highlighted the importance of standardization in the fleet.

''I have really nothing to suggest, only thing that comes to my mind is that it would be nice to have more vessels that are capable of using bio-oil.''
-Interviewee 1

''You should have a consistent fleet, of same sized vessels that are low fuel consuming. One element is of course standardization in the fleet, this is one step forward.

The other step is of course the greener fuels and which ones to use. If all other companies are using let's say methanol and you are sailing on bio-oil, are you competitive and what is the worldwide availability of the fuel?''
-Interviewee 2

''It would be beneficial if you signposted for us where you think that marine legislation is going, the international legislation. Sometimes I'm looking the global data out there and trying to look ahead and saying hey five years down the line what are the emissions targets, what's it likely to be in 2030, are we realistically kind of have to conform to this in the maritime industry. If, you kept us on board with that, it probably would help us sell this not only to customers but to the whole group and the management as well. If you could give us some indicators that where you think global legislations going so that we can keep up with it. And from like overall view, I'm sure you have a lot to do in the shipping industry. But from our side of course if there would be a day that we only have the low emission option so that those are the targets to get there. So that we're not talking about if we choose it, that's just kind of what's there. So, I'd say that's probably where it's I think heading and you're heading as well.''
-Interviewee 3

''I can't really comment anything. As far as I know, you and the competitors handle things in the same style. I take it for granted that in the future you will follow the development of what is happening in the industry, and you will be sailing along with the highest waves.''
-Interviewee 4

'' I would like to have more vessels that can perform eco-voyages. We would like to your ladies also having a possibility to connect shore power. - - We are going to require owners to use shore power in the future.''
-Interviewee 5

The last question of the interview was how the case company's environmental initiatives compare to other shipping companies.

''In competitors' marketing, the use of bio-oil or other factors affecting the greenness have not come across.''
-Interviewee 1

''The thing is of course as we discussed already years back is that you have been the front runner on trying to develop things. The question now is that are you not

cached up by the others looking to build a scope? - - I think that your company should have a longer forward policy about what way you want to go with the company.''
-Interviewee 2

''As said before, the companies I am dealing with for the sizes of the vessels that we are also using with you, so nobody else is offering us a low carbon biofuel alternative. So, you're ahead of them for that. - - From the shipping point of view, you're giving us more than the other companies are. The other companies aren't offering anything like that at this stage.''
-Interviewee 3

''I can't really comment, as far as I know, you and the competitors handle things in the same style.''
-Interviewee 4

''I think that in a way you are doing same things that others, but you have plenty of these cute small things and this Eco-Voy concept is a good example.''
-Interviewee 5,

One thing that was raised above others was the possibility to use bio-oil as a fuel onboard of certain vessels. The case company's Eco-Voy concept was also praised. It was also stated that all the other players in the field are working with similar operations and functions.

After reaching the IMO 2030 goals, the shipping industry is then going towards IMO 2050, and the most important issue to be thought about from the point of shipping companies is to select and justify the selection of new alternative fuel. The justifying must be done to have the background information and support for its availability and enabling use. It was also interesting to find out from the interviews that even with this small scope, there was a great difference in the opinions on what kind of vessels, what size of vessels, and what fuel burning vessels the clients or possible clients would like to be in the future. The researcher has of course read about competing shipping companies and what vessels they are building, it will be interesting to see how the decisions in fuel selection will work in the future and which of these decisions have been the most effective in terms of productivity, efficiency, and the environment. The legislation and EU or worldwide

guidelines and ideology must be in line with each other before companies can really make any future seeing decisions. Liquefied natural gas (LNG) in the first place was stated by the EU to be the one of the number one future fuels, but now, due to the facts that it has huge methane emissions, and because LNG ties the infrastructure to fossil fuels, make it not so sustainable solution in the end. Many shipping companies have started to build LNG vessels, and due to these new findings, the new buildings are currently at hold. So, it can be stated that it is crucial for shipping companies to make decisions about the future fuels and scrape together suitable vessels, but due to the unstable and changing decisions in the Union and Commission levels make these decision-making extremely hard. As per the interviewee results EU and IMO should have a general policy on what is green fuels and what is not. The rules should be worldwide, since now EU, USA, India, and China have all their own rules and guidelines about the future of shipping. From the interviewees it can also be concluded that some companies would prefer straightforward taxation for fossil fuels, this would force shipping companies worldwide to go for the sustainable alternative fuels, and like this affect to their clients and in the and affecting to the whole supply chain process.

Sustainability in shipping will be a more and more important topic, and companies must at some point put time and effort and planning their operations and actions in order to achieve operations that are as sustainable as possible. As the interviewees in this study stated environmental regulations, green supplier selection, and green procurement and already current topics, but these will be even more current in the future.

In the end, it can be concluded that the case company has gained a good reputation, and the customers have a good picture of it. Customers are confident and committed to co-operation and intend to continue using the case company's shipping services also in the future. Customers even stated that the case company is the perfect example of an environmentally sustainable shipping company. For the case company, the advice is to keep up the good spirit, continue in the same way with its operations, and nurture the environment as best as possible.

5 Conclusions

In this section the empirical results concluded, the main findings of the study will be summarized, and he limitations for the study and practical implications will be presented. Lastly, this section will provide suggestions for the future study.

5.1 Summary of the findings

The aim of this research was to examine and analyze the significance and impact of environmental sustainability in the selection of a shipping company. As a result of this this study, there should be more information and und understanding about how companies are selecting shipping companies and what is the role of environmental sustainability in it.

It can be concluded that environmental sustainability has an impact and significance for companies when selecting service providers. Environmental sustainability is not always the main affecting factor, but it can be seen as an initiator for new operations and activities. After environmental sustainability has been brought up in the company and after the company has decided to modify its operations to move towards a greener way, several aspects will be added to the company's processes. These include for example green supply chain management, and green procurement, in the end, these aspects affect to the green supplier selection. So, it could be stated that environmental sustainability is the key behind all the green operations that companies are utilizing.

When looking about the importance of sustainability compared to profitability and effectiveness, based on this research it can be stated that these three mostly go hand in hand. In some cases, sustainability might be considered as a key factor, and in some cases profits comes first. Companies see environmental sustainability as a major aspect, because it is not only doing good for the planet, but also increasing profitability, increasing the market value, binding employees, and lastly, satisfying the customers. It can be

concluded that companies that are adapting green practices for their own account are future-looking, and the investments will for sure pay themselves back in time.

The involvement of top management is a vital aspect when looking into the significance and impact of environmental sustainability in service provider selection. Green reporting can also be seen as a tool that increases the importance of environmental sustainability in the selection process.

Companies are adapting green supply chain management practices, but the adaptation is not necessarily affecting to all departments of the company. When looking into the internal and external supply chain management practices that companies are adapting the major internal green supply chain management practices are Eco-Design and internal environmental management. On the other hand, the major external green supply chain management practices include investment recovery, collaboration with customers, and green purchasing. It can be stated that these practices will in the future be more and more important. These internal and external supply chain management practices are affecting to green procurement and at the end to the selection of shipping companies as shown in the Figure 6. below.

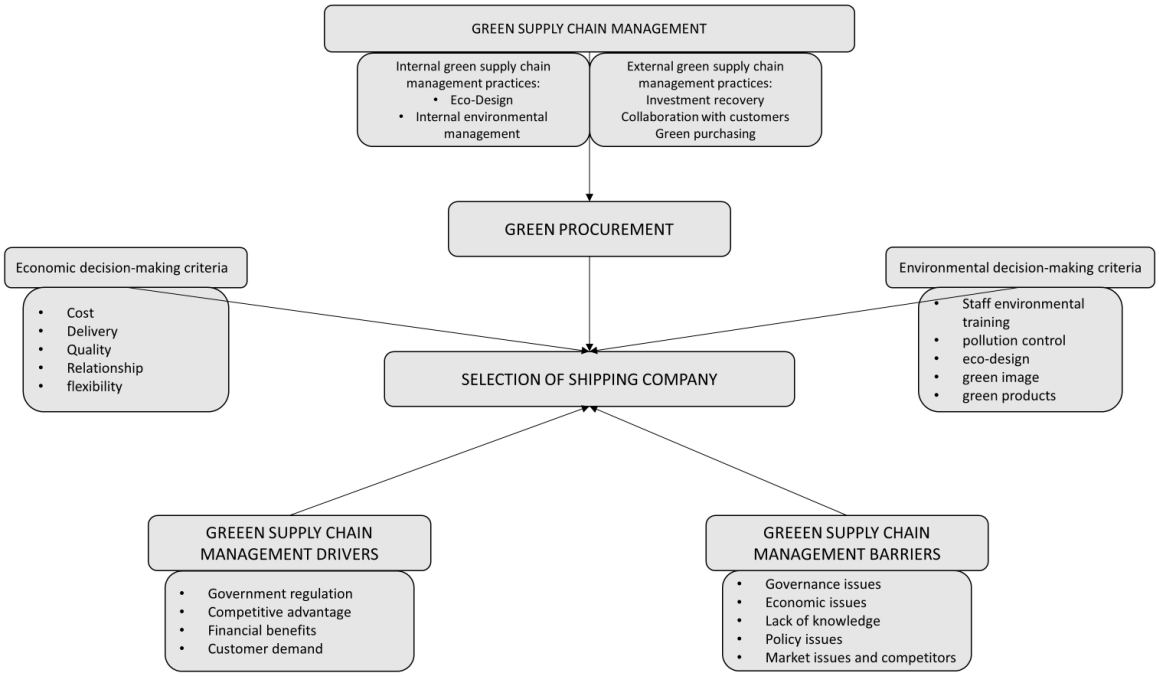

Figure 6. Factors affecting to selection of shipping company.

When looking for the green supply chain management drivers and barriers, it can be stated that legislation can be seen as a barrier for implementing green supply chain management practices, since there is not enough pressure to push companies to adapt the practices and be more environmentally friendly. Other common barriers include price or cost, regulation, and competition. The shipping companies themselves can be seen as a barrier, because of the uncertainty of future fuels and the lack of straightforward investment policy for them. On the other hand, the most common drivers include customers and customer demand, legislation and regulation, and publicity value. The affecting drivers and barriers are visualized in the Figure 6. above.

During the process of the selection of a shipping company, companies are utilizing both environmental and economic decision-making criteria, as shown in the Figure 6. Staff environmental training, pollution control, eco-design, green image, and green products are environmental criteria that companies are mostly utilizing. On the other hand, cost, delivery, quality, relationship, and flexibility are the most common economic criteria that companies are utilizing.

In the end, it can be concluded the whole supply chain and supply networks need to be sustainable, before the company can call itself a sustainable company. So, it can be stated that the environmental sustainability is an important factor in the selection of a shipping company, since that is basically the one aspect that starts the green thinking in companies.

5.2 Theoretical and managerial implications

In this section, the theoretical and managerial implications will be presented.

First of all, there are not so many previous studies available, related to the selection of shipping companies. Service provider selection studies can be found, but studies focused specifically on the selection of shipping companies are uncommon.

To begin it is important to understand from where the demand and interest towards green solutions arises. Similar as Lee & Lim (2016) stated, also part of the interviewees stated that due to the environmental awareness and awareness about environmental issues, customers tend to look for more environmentally friendly solutions. To provide these solutions green supply chain management practices must be adapted. Both the interviewee results and Lee & Lim (2016) agree that green supply chain management practices can be seen as an advantage in the markets and that those are affecting to the company reputation when selecting shipping companies.

Green procurement is a part of company's basic operations as Millington (2020) stated. Interviewees partly agreed with Millington, that green procurement is important. Even though some interviewees agreed that the importance is vital, they pointed out, that in the end the adaptation of these practices is costing more, and their clients are not interested or ready to pay a premium for greener solutions. Moser (2015) on the other hand stated that commitment to green solutions will increase profitability, increase the market value, bind employees, and lastly, satisfy the customers. It is possible to conclude from Moser (2015) and from this study that companies that are adapting green practices

for their own account are future-looking, and the investments will for sure pay themselves back in time.

The interviewee responses gave a picture, that companies are interested in environmental sustainability-related matters, and as Tate et al. (2012) concluded, the whole supply chain and supply networks need to also be sustainable, before the company can call itself a sustainable company. It must still be noted that Tate et al. (2012) stated that suppliers in some cases might be the biggest factor that affects the environment. From these interviews, the researcher did not find any evidence supporting this claim. It can be concluded that the transportation method is affecting greatly the whole supply chain process and its environmental effect.

The practical implications of this study can be stated to be significant for companies providing shipping services but also for companies that are looking for shipping services. The main practical implication of this study is that it provides guidelines for any company about the selection process of shipping companies.
This study also explains what are the most important factors that are affecting to the shipping company selection process and what are the economic and environmental criteria that companies are using when selecting shipping companies based on environmental sustainability. In addition, this study presents the importance of green supply chain management among companies, that are using shipping services. Lastly, this study presents insights for the future of maritime transportation and for the need for alternative fuels.

One of the practical implications of this study is addressed to international legislators that they should make clear laws that everyone must follow around the world. In the future, it will be difficult to achieve anything if national goals and regulations vary considerably. In addition, this study also presents tips for the EU and IMO on how they should make consistent plans, goals, and regulations for the future of shipping.

5.3 Limitations and suggestions for further studies

In general, studies tend to have limitations, and this one is not an exemption. In this study, the limitation is that even though green procurement is related to human behaviors, different behavioral theories are not included in this study. The lack of previous studies focusing on the selection of shipping companies can also be seen as a limitation.

This study was built around the case company's biggest clients, and like this, the sampling was done by purposive sampling. In the future, similar studies could be carried out with a bigger sample size and with probability sampling, in more detail random sampling that would allow the researcher to generate conclusions from a larger sample. Additionally, it would be interesting to see if the results from this research are in line when thinking about the selection of other logistics solutions than the selection of shipping companies. So, the second suggestion for future study is to perform it also for different logistics areas; would the results be different, if the focus is on for example selection of an air transport company or a road transport company?

References

Aktas, E., & Ulengin, F. (2005). Outsourcing logistics activities in Turkey. Journal of enterprise information management, 18(3), 316-329. https://doi.org/10.1108/17410390510591996

Alibašić, H. (2020) Global encyclopedia of public administration, public policy, and governance. Springer International AG, Cham. https://doi. org/10.1007/978-3-319-31816-5_3427-1

Banomyong, R., & Supatn, N. (2011). Selecting logistics providers in Thailand: A shippers' perspective. European journal of marketing, 45(3), 419-437. https://doi.org/10.1108/03090561111107258

Bhardwaj, A. K., Garg, A., Ram, S., Gajpal, Y., & Zheng, C. (2020). Research Trends in Green Product for Environment: A Bibliometric Perspective. International journal of environmental research and public health, 17(22), 8469. https://doi.org/10.3390/ijerph17228469

Bjorklund, M. (2011). Influence from the business environment on environmental purchasing — Drivers and hinders of purchasing green transportation services. Journal of purchasing and supply management, 17(1), 11-22. https://doi.org/10.1016/j.pursup.2010.04.002

Boogaard, B., Boekhorst, L., Oosting, S., & Sørensen, J. (2011). Socio-cultural sustainability of pig production: Citizen perceptions in the Netherlands and Denmark. Livestock science, 140(1-3), 189-200. https://doi.org/10.1016/j.livsci.2011.03.028

Clinton, M., Doumit, M., Ezzeddine, S., & Rizk, U. (2020). Using frame analysis to re‐analyse the results of inductive thematic analysis: A methodological discussion of investigating meanings and learning contexts in baccalaureate nurse education. Journal of advanced nursing, 76(11), 3204-3212. https://doi.org/10.1111/jan.14485

Dube, A., & Gawande, R. (2014). Barriers for Green Supply Chain Management Implementation. *Proceedings of 3rd International Conference on Resent Trends in Engineering and Technology. (ICRTET'2014).*

Du, G., Sun, C., & Weng, J. (2016). Liner shipping fleet deployment with sustainable collaborative transportation. *Sustainability (Basel, Switzerland), 8*(2), 165. https://doi.org/10.3390/su8020165

Du Pisani, J. A. (2006). Sustainable development – historical roots of the concept. Environmental Sciences, 3:2, 83-96, DOI: 10.1080/15693430600688831

Enworo, O. C. (2023). Application of Guba and Lincoln's parallel criteria to assess trustworthiness of qualitative research on indigenous social protection systems. Qualitative research journal, 23(4), 372-384. https://doi.org/10.1108/QRJ-08-2022-0116

Eriksson, P., & Kovalainen, A. (2015). Qualitative Methods in Business Research: A Practical Guide to Social Research. SAGE Publications.

Etse, D., McMurray, A., & Muenjohn, N. (2023). Sustainable Procurement Practice: The Effect of Procurement Officers' Perceptions. Journal of business ethics, 184(2), 525-548. https://doi.org/10.1007/s10551-022-05150-w

Finnlines. 2019. Finnlines news. Issue 2/2019 seq. no. 26. https://shipowners.fi/wp-content/uploads/2019/08/FL-News-2019_2.pdf.

Galletta, A., Cross, W. E., & William E. Cross. (2013). Mastering the Semi-Structured Interview and Beyond: From Research Design to Analysis and Publication. NYU Press.

Gegovska, T., Koker, R., & Cakar, T. (2020). Green Supplier Selection Using Fuzzy Multiple-Criteria Decision-Making Methods and Artificial Neural Networks. Computational intelligence and neuroscience, 2020, 1-26. https://doi.org/10.1155/2020/8811834

Ghosh, M. (2019). Determinants of green procurement implementation and its impact on firm performance. Journal of manufacturing technology management, 30(2), 462-482. https://doi.org/10.1108/JMTM-06-2018-0168

Giunipero, L. C., Hooker, R. E., & Denslow, D. (2012). Purchasing and supply management sustainability: Drivers and barriers. Journal of purchasing and supply management, 18(4), 258-269. https://doi.org/10.1016/j.pursup.2012.06.003

Govindan, K., Rajendran, S., Sarkis, J., & Murugesan, P. (2015). Multi criteria decision making approaches for green supplier evaluation and selection: A literature review. Journal of cleaner production, 98, 66-83. https://doi.org/10.1016/j.jclepro.2013.06.046

Gurel, O., Acar, A. Z., Onden, I., & Gumus, I. (2015). Determinants of the Green Supplier Selection. Procedia, social and behavioral sciences, 181, 131-139. https://doi.org/10.1016/j.sbspro.2015.04.874

Halonen, J. (2018, December 16). Meriliikenne – suurin saastuttaja vai kestävin kuljetusmuoto? Xamk Read. https://read.xamk.fi/2018/logistiikka-ja-meren-kulku/meriliikenne-suurin-saastuttaja-vai-kestavin-kuljetusmuoto/

Harvey-Jordan, S., & Long, S. (2001) The process and the pitfalls of semi-structured interviews. Community Practitioner. Maidstone. Vol. 74, Iss. 6, (Jun 2001): 219.

Hashemi, S. H., Karimi, A., & Tavana, M. (2015). An integrated green supplier selection approach with analytic network process and improved Grey relational analysis. International journal of production economics, 159, 178-191. https://doi.org/10.1016/j.ijpe.2014.09.027

Hirsjärvi, S., Remes, P. & Sajavaara P. 2010. Tutki ja kirjoita. Tammi

Jharkharia, S., & Shankar, R. (2007). Selection of logistics service provider: An analytic network process (ANP) approach. Omega (Oxford), 35(3), 274-289. https://doi.org/10.1016/j.omega.2005.06.005

Joshi, Y., & Rahman, Z. (2015). Factors Affecting Green Purchase Behaviour and Future Research Directions. International Strategic Management Review, 3(1-2), 128-143. https://doi.org/10.1016/j.ism.2015.04.001

Khan, N., Sudhakar, K., & Mamat, R. (2021). Role of biofuels in energy transition, green economy and carbon neutrality. Sustainability (Basel, Switzerland), 13(22), 12374. https://doi.org/10.3390/su132212374

Kiger, M. E., & Varpio, L. (2020). Thematic analysis of qualitative data: AMEE Guide No. 131. Medical teacher, 42(8), 846-854. https://doi.org/10.1080/0142159X.2020.1755030

Kumar, M., & Joji, R. T. (2023). Study of the interplay among internal and external barriers to GSCM in the Indian leather industry using the total ISM and MICMAC methodology. Cogent business & management, 10(2), . https://doi.org/10.1080/23311975.2023.2234697

Lam, J. S. L., & Zhang, L. (2014). Enhanced logistics service provider framework for higher integration and efficiency in maritime logistics. International journal of logistics, 17(2), 89-113. https://doi.org/10.1080/13675567.2013.836161

Lee, C., & Lim, S. (2020). Impact of environmental concern on image of internal GSCM practices and consumer purchasing behavior. *The Journal of Asian finance, economics, and business, 7*(6), 241-254. https://doi.org/10.13106/JAFEB.2020.VOL7.NO6.241

Maxwell, J., & Chmiel, M. (2014). Notes toward a theory of qualitative data analysis. In The SAGE Handbook of Qualitative Data Analysis (pp. 21-34). SAGE Publications Ltd, https://doi.org/10.4135/9781446282243

Mentzer, J. T., DeWitt, W., Keebler, J. S., Min, S., Nix, N. W., Smith, C. D., & Zacharia, Z. G. (2001). DEFINING SUPPLY CHAIN MANAGEMENT. Journal of business logistics, 22(2), 1-25. https://doi.org/10.1002/j.2158-1592.2001.tb00001.x

Micheli, G. J., Cagno, E., Mustillo, G., & Trianni, A. (2020). Green supply chain management drivers, practices and performance: A comprehensive study on the moderators. Journal of cleaner production, 259, 121024. https://doi.org/10.1016/j.jclepro.2020.121024

Milne, M. J., Tregidga, H., & Walton, S. (2009). Words not actions! The ideological role of sustainable development reporting. *Accounting, auditing & accountability journal, 22*(8), 1211-1257. https://doi.org/10.1108/09513570910999292

Millington, D. (2020). WHAT IS PROCUREMENT? Procurement 101: Procurement Management Process. American Fastener Journal, 36(3), 43.

Moser, A. K. (2015). Thinking green, buying green? Drivers of pro-environmental purchasing behavior. *The Journal of consumer marketing, 32*(3), 167-175. https://doi.org/10.1108/JCM-10-2014-1179

Nielsen, I.E., Banaeian, N., Golińska, P., Mobli, H., Omid, M. (2014). Green Supplier Selection Criteria: From a Literature Review to a Flexible Framework for Determination of Suitable Criteria. In: Golinska, P. (eds) Logistics Operations, Supply Chain Management and Sustainability. EcoProduction. Springer, Cham. https://doi.org/10.1007/978-3-319-07287-6_6

Noussan, M. (2020). The Future of Transport Between Digitalization and Decarbonization. Springer International Publishing.

Othman, M., Adam, A., Najafi, G. & Mamat, R. (2017). Green fuel as alternative fuel for diesel engine: A review. Renewable and Sustainable Energy Reviews, 80(C), 694-709. https://doi.org/10.1016/j.rser.2017.05.140

Purvis, B., Mao, Y., & Robinson, D. (2019). Three pillars of sustainability: In search of conceptual origins. Sustainability science, 14(3), 681-695. https://doi.org/10.1007/s11625-018-0627-5

Saeed, A., Jun, Y., Nubuor, S., Priyankara, H., & Jayasuriya, M. (2018). Institutional Pressures, Green Supply Chain Management Practices on Environmental and Economic Performance: A Two Theory View. Sustainability (Basel, Switzerland), 10(5), 1517. https://doi.org/10.3390/su10051517

Sajjad, A., Eweje, G., & Tappin, D. (2015). Sustainable Supply Chain Management: Motivators and Barriers. Business strategy and the environment, 24(7), 643-655. https://doi.org/10.1002/bse.1898

Sajjad, A., Eweje, G., & Tappin, D. (2020). Managerial perspectives on drivers for and barriers to sustainable supply chain management implementation: Evidence from New Zealand. Business strategy and the environment, 29(2), 592-604. https://doi.org/10.1002/bse.2389

Saunders, M., Lewis, P. & Thornhill, A. (2023) Research methods for business students. Ninth Edition. Pearson Education UK.

Serra, P. & Fancello, G. (2020). Towards the IMO's GHG Goals: A Critical Overview of the Perspectives and Challenges of the Main Options for Decarbonizing International Shipping. Sustainability (Basel, Switzerland), 12(3220), 3220. https://doi.org/10.3390/su12083220

Soone, J. Sustainable maritime fuels 'Fit for 55' package: The FuelEU Maritime proposal. EPRS, European Parliament, March 2023.

Smit, B., & Onwuegbuzie, A. J. (2018). Observations in Qualitative Inquiry: When What You See Is Not What You See. *International journal of qualitative methods, 17*(1), 160940691881676. https://doi.org/10.1177/1609406918816766

Srinivasan, S., Agrahari, A., & Kumar, A. (2023). Role of Executive Sponsors in business analytics success - Understanding their influence domains using Deductive Thematic Analysis. Journal of decision systems, 32(2), 409-438. https://doi.org/10.1080/12460125.2022.2043576

Stephenson, R. L., Paul, S., Wiber, M., Angel, E., Benson, A. J., Charles, A., Sumaila, U. R. (2018). Evaluating and implementing social–ecological systems: A comprehensive approach to sustainable fisheries. Fish and fisheries (Oxford, England), 19(5), 853-873. https://doi.org/10.1111/faf.12296

Susanty, A., Sari, D. P., Rinawati, D. I., & Setiawan, L. (2019). The role of internal and external drivers for successful implementation of GSCM practices. Journal of manufacturing technology management, 30(2), 391-420. https://doi.org/10.1108/JMTM-07-2018-0217

Suomen Varustamot. 2021. Merenkulun hiilidioksidipäästöt. Retrieved May 4, 2021, from https://shipowners.fi/vastuullisuus/ymparisto/ilmastosuojelu-ja-ilmastonmuutos/merenkulun-hiilidioksidipaastot/.

Tate, W. L., Ellram, L. M., & Dooley, K. J. (2012). Environmental purchasing and supplier management (EPSM): Theory and practice. *Journal of purchasing and supply management, 18*(3), 173-188. https://doi.org/10.1016/j.pursup.2012.07.001

United States Environmental Protection Agency. 2021. Greenhouse Gas Emissions. Retrieved April 26, 2021, from https://www.epa.gov/ghgemissions/overview-greenhouse-gases.

Walker, H., Di Sisto, L., & McBain, D. (2008). Drivers and barriers to environmental supply chain management practices: Lessons from the public and private sectors. Journal of purchasing and supply management, 14(1), 69-85. https://doi.org/10.1016/j.pursup.2008.01.007

Younis, H., Sundarakani, B., & Vel, P. (2016). The impact of implementing green supply chain management practices on corporate performance. Competitiveness review, 26(3), 216-245. https://doi.org/10.1108/CR-04-2015-0024

Appendices

Appendix 1. Semi-structured interview guide

Introduction

First of all, thank you for taking part in this interview. We are interviewing you in order to understand what the current stand is, and what is the direction in the future towards green supply chain management, green procurement and green supplier selection. Lastly this interview will be performed in order to find out the interest towards carbon neutral shipping options.

This interview is planned to take maximum around one hour.

In order to avoid missing any comments or points you provide, please confirm if I may record this interview.

All responses will be confidential and those will be handled anonymously in the report. So, neither you nor the company can be linked to the answers presented in the thesis.

Green Supply Chain Management

1. How important is sustainability as a big theme for your company.
    i. Why?

2. Is your company adapting green supply chain management practices? If yes, what?
    i. Why are these practices implemented?
    ii. What is the motivation for implementing these practices?
    iii. Why?

    Prompts: Internal (eco-design + internal environmental management) / External (green purchasing, investment recovery and customer cooperation

3. Will there be changes in the importance of green supply chain management in the future?
    i. What changes?
    ii. Why?

4. How does the green supply chain management affect to the company and its operations?
    i. Why?

5. What do you see as a biggest barrier(s) when thinking about green supply chain management?
    i. Why?

6. What do you see as a biggest driver(s) when thinking about green supply chain management?
    i. Why?

Green Procurement

7. How do you see the relationship between profitability, effectiveness, and sustainability?
    i. Why?

8. What is the importance of environmental regulations shipping?
    i. Why?

9. Is your company adapting green procurement?
    i. If yes, how?
    ii. Is the top management involved?
    Prompts: Green purchase intention vs. green purchase behavior

---

Green supplier selection

10. How is your company choosing shipping companies?

11. What are the decision-making criteria used when choosing shipping companies?
    i. Why?
    ii. What is their order of importance?

12. What are the economic criteria's that are considered when your company is choosing shipping companies?
    i. Why?

13. What are the environmental criteria's that are considered when your company is choosing shipping companies?
    i. Why?

14. Can more environmentally friendly transport cost more compared to "normal".
    i. Why or why not?
    ii. If yes, can you estimate how much more your company could be willing to pay for the same premium compared to conventional (%)?

15. If the ship uses bio-oil (or another carbon-neutral alternative fuel) instead of regular fuel when transporting your cargo, do you see this as advantage for your company?
    i. Why or why not?
    ii. If yes; How much premium is your company ready to pay for carbon neutral shipments?

16. If the fuel consumption of the ship carrying your cargoes is significantly lower compared to a traditional ship, do you see this as somehow significant for your company?
    i. Why or why not?

Additional theme for empirical research

17. What green reporting tools are you using?
    i. Why?

18. Have goals been set in your company to improve environmental efficiency?
    i. What goals?
    (If so, do these goals specifically apply to the function/department you represent?)

19. What do you think an environmentally responsible shipping company is like?

20. How would you compare case company with its competitors/other shipping companies?

21. Would your customers appreciate the fact that your product has been transported in a more environmentally friendly way / carbon neutral way? Would this be something worth mentioning when you sell your products on?

22. What benefit or advantage could there be for your company from using low carbon / carbon neutral shipments?
    i. Why?
    Prompts: e.g. marketing or image benefit, carbon balance, counting and reducing, emissions trading? etc.

23. Does your company belong to emissions trading system?

24. Do environmental sustainability certifications have effect when your company is choosing shipping companies?

25. How does case company's environmental responsibility activities influence your perceptions of case company as a shipping company?

26. Does case company's environmental responsibility activities impact your commitment to choose case company as a shipping company.
    i. Why?

27. How case company's environmental responsibility activities influence your attraction towards the company?
    i. Why?

28. In what ways do you think that case company could enchase its environmental responsibility efforts?

29. How does case company's environmental responsibility initiatives compare to other shipping companies?
