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Financing the Shipping Industry into a Green Economy

An Empirical Study on the Future of Green Debt

Financing within the Shipping Industry

by

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Abstract

The emerging concept of green debt financing is becoming a vital driver in the environmental transition of the shipping industry. This is why this thesis analyses the current role of green debt financing in the industry in order to identify gaps in the concept. To gather the information needed surveys were sent out to industry professionals who all had extensive knowledge either on the topic or on the industry. It is found through the surveys and other information explored, that green debt financing can aid in the compliance of the IMO 2050 GHG Cap by being a supportive tool which drives green technological developments, and further makes it easier to be transparent in order to create a green shipping economy. It is, however, shown from the results from the surveys that green debt financing needs unified and transparent standards across the whole industry as to obtain the benefits green financing can create. The thesis then presents the role of each professional and focuses on how important it is for them to collaborate throughout the industry. It is further found that green debt financing will impact the future of shipping in a positive way by bringing industry professionals together, promote environmental solutions and establish integrated criteria to green debt financing, which will make it easier to use the concept in real life.

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List of Abbreviations

ATB	= Amsterdam Trading Bank
CO₂	= Carbon Dioxide
EBRD	= European Bank for Reconstruction and Development
EIG	= European Investment Group
ESG	= Environmental, Social and Governance
EU	= European Union
GDF	= Green Debt Financing
GDP	= Gross Domestic Product
GHG	= Green House Gas
GIB	= Green Investment Bank
GIB	= Green Investment Group
IGO	= Intergovernmental Organisation
IMO	= International Maritime Organisation
NBFI	= Non-Bank Financial Institutes
NO_x	= Nitrogen Dioxide
OECD	= Organisation for Economic Co-operations and Development
SDG	= Sustainable Development Goals
SSI	= Sustainable Shipping Initiative
UN	= United Nations

Definition List

Climate Finance = financing from various private, public and alternative sources which seeks to address climate change through various mitigation and adaption activities

Green = refers to an activity which incorporate environmentally friendly practices or products

Green Economy = an economy that aims at being socially inclusive while focusing on environmental mitigation, resource efficiency and ecological scarcities that will create sustainable development

Chapter 1. Introduction

The shipping industry is considered to play a key role in the global economy, with the industry standing for over 90 percent of global trade (DNB, 2019). Not only does the ocean contribute to a large part of the world economy, it also contains 99 percent habitat for life, generates half the oxygen the human population breaths and provides food and income for much of the population of the world (DNB, 2019). Due to the extraordinary functions of the ocean, it is vital to keep the ocean healthy for the future of our planet. Not only is there evidence that climate change has imperative consequences for the environment but there is also overbearing evidence that it will have important implications for financial stability that cannot be disregarded (EBF, 2017). Thus, there has been an increase in policy measures regarding the impact on the environment within the industry over the years, in order to mitigate climate change and curb climate risks. Emissions from shipping are predicted to increase between 50 and 250 percent by 2050, therefore the focus on the shipping industry to obtain green initiatives is becoming increasingly important, particularly on the European continent (ING, 2019a). As the shipping industry is considered to be a very capital-intensive industry, it makes it particularly challenging to acquire the funding needed for the green transition. There are, however, current strides in this specific area which allow for banks and other financial institutions to integrate climate consideration into their lending decisions (Hellenic Shipping News, 2019). It is becoming clearer for the world, including the shipping industry, that banks and other financial institutors should be obliged to substantiate their investment decision on the basis of sustainability and environmental risks. As the importance of green investment is becoming more pivotal in the industry, this study aims at analysing how green debt financing (GDF) can aid in the mitigation of environmental impacts and further aid in the global transition to a greener economy within the industry itself.

1.1 The purpose of this study

The main purpose of this study is to better understand the implication of green debt financing in the shipping industry, as additional environmental regulations are continually being introduced. By getting the involvement of industry professionals through surveys, this paper can to some extent give an outlook on the global agenda due to the fact that many shipping companies follow the same trends. Further, the professionals interviewed through the surveys all belong to well-known shipping companies and shipping financiers which will give a clear overview on the future of green debt financing within the industry. Therefore, the research will

give valuable insight regarding green debt financing within an industry with an increasing regulatory environment.

1.2 Thesis Objective and Research questions

The objective of this study is to analyse the current green debt financing available to the shipping industry in order to identify the current barriers the industry is facing when it comes to the concept of green debt financing, which aims to achieve compliance with the International Maritime Organization's (IMO) 2050 regulation on reducing carbon emissions by 50 % (from the 2008 levels) and the United Nation's (UN) Sustainable Development Goals. The following research questions help support the layout of the research;

Main research question: How can green debt financing aid in the compliance of the 2050 IMO regulation on reducing Green House Gas (GHG) emissions by 50%, and how will green debt financing further impact the future of the shipping industry?

Sub research questions:

1. What are the current barriers the shipping industry is facing in order to create a greener economy?
2. How can the shipping industry and financial creditors come together in order to establish a greener economy and thus reduce emissions?
3. How will the current sources of capital available to the shipping industry change?
4. How can green investment facilitate the less traditional shipping business models as to become more sustainable?

There is a clear relationship between the main research question and the sub research questions. The sub research questions are set in place as they look deeper into how green debt financing will impact the future of shipping by looking at it from different perspectives. Sub research question 1 tackles the current barriers which the industry is facing in order to implement green debt financing. By answering this question, it supports the mission of finding out how green debt financing can impact the future of the shipping industry. The rest of the sub questions, namely question 2 through 4, give light of how green debt financing can impact the shipping industry, thus aiding in answering the main research question.

1.3 Relevance of this Study

This research is of relevance for the current shipping industry from various industry professionals' perspective. The paper seeks to understand how green debt financing will affect these professionals in relation to the research questions. The research topic is under current change and information is continually updated, as seen from the information disclosed in the literature review. With the opportunity to give out surveys to various industry professionals the paper is seeking the views on green debt financing from the industry itself. It will look into the relevance of green debt financing in the current industry and expose the future impacts green debt financing will have. This research will hopefully be of interest to financiers and shipping companies who are looking for a more optimal solution to comply with the upcoming environmental regulations, as well as to shipping professionals who are seeking to be more sustainable.

1.4 Thesis Structure

The structure of the thesis is outlined as shown in figure 1. Chapter 1 presents the value this research has to the shipping industry by giving a short introduction on the emerging concept of green financing. It additionally lays the foundation for why the specific main research and sub research questions are asked. The following chapter, namely chapter 2, focuses on the theoretical background of this subject. It first lays the ground of the increased pressure of environmental regulations both outside and inside the shipping industry. The chapter then explores the transitions already made when it comes to fuel source changes within the shipping industry. This is to outline how difficult it has been in the past to change fleets over to different fuels and be able to later see if the transition the shipping industry is currently facing will comprise any of the same features. The chapter will then go into the current financing available to the shipping industry and focuses on some of the criticism the present financing system is facing. The current green debt financing available is then studied and reviewed to be able to later look at the barriers the industry is facing when it comes to obtaining GDF. Chapter 3 outlines how the research process is designed in order to collect the data needed for the topic. It starts with the research approach used in order to answer the research questions. It then goes into the data sources gathered in the process and explains the interview process while presenting the structure of the questions asked. Lastly it presents the limitations to the research.

Chapter 4 is a case study on how two countries, namely Norway and the Netherlands, are situated when it comes to the concept of green investment. The two countries features are presented to compare their current financial and political standpoint with the different environmental goals set by the governments. After these features are looked at, the bank systems and green debt financing opportunities within the two countries are presented in order to create a better understanding of what atmosphere is needed to foster successful green financing opportunities. Further it will also give a better understanding of what kind of barriers the shipping industry is facing which prevent broader adaption of green debt financing and give a better overview of how the shipping industry and financial creditors come together in order to establish a greener economy. This case study is thus designed to gain concrete, contextual and in-depth knowledge that can be further brought to chapter 5. As it will outline the key characteristics of green debt financing within these countries and can therefore be used to give an assessment of the current green debt financing available elsewhere.

In chapter 5 the analysis and results of the data presented in the previous chapters and the answers from the questionnaires are presented. It answers the main- and sub research questions and further fills some of the holes the current information on green debt financing is missing. The last chapter, chapter 6, provides the reader with a conclusion to this study. The main outcomes are given based on the data presented earlier in the study. It thereafter gives recommendations on what future research should include, in order to explore a wider spectrum of the topic.

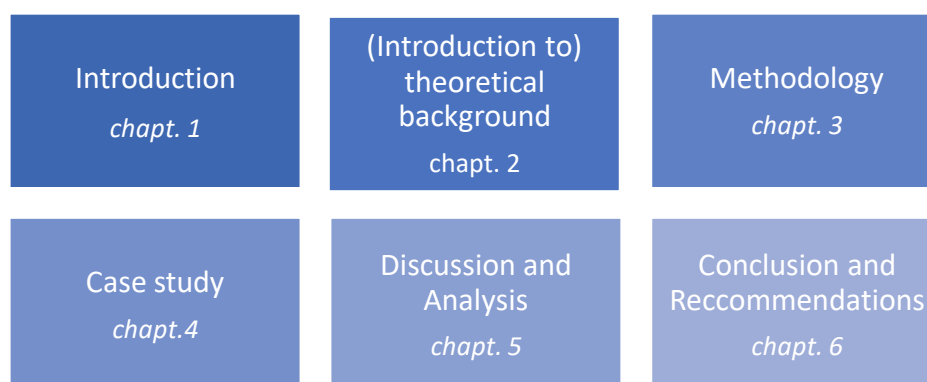


Figure 1: Outlines the structure of the thesis

(source: Author's creation)

Chapter 2. Literature Review

The following chapter studies the already existing literature of on GDF and will establish a theoretical background for the thesis scope making it easier to recognize crucial articles, authors and discoveries, in addition to better understand and study the current state of information (Battacherjee, 2012). However, as explained by Battacherjee (2012), the most important reason for this specific chapter is to identify any gaps in the current state of information. Thus, this chapter will study and outline the current literature on Green Debt Financing, in order to later analysis and identify the current barriers the shipping industry is facing as to create a greener economy in the shipping industry. It will further help in the process of investigate how large of a role green debt financing will have as to comply with the upcoming environmental regulations the industry is facing. Before going into the literature review it is important to define what green financing and green debt financing is in relation to this thesis with the purpose of making it clearer for the upcoming information presented.

2.1 Definitions Relevant to the Research

2.1.1 Green Finance

There are several ways of researching and talking about green financing. This is due to the various sources of financing available globally. Further, there is no one name or no one framework to green financing, therefore it is important to establish green financing in regard to this research. Green finance is becoming a broad term which refers to financial investments from various sources that flows into sustainable initiatives, environmental products and policies that will encourage the transition to a green economy (Lindenberg, 2014; ICMA, 2020). The concept further includes climate finance but is not considered to be limited to this. Thus, including wider environmental objectives, such as biodiversity protection (Lindenberg, 2014). Green financing comprises the following activities:

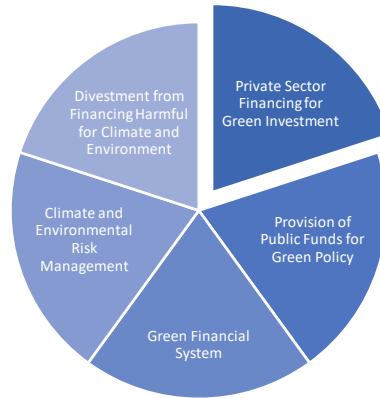


Figure 2: Features of the activities within green financing

(source: Lindberg, 2014; Brockman, 2017)

2.1.1.1 Green Debt Financing

Green Debt Financing is the term which is used throughout this study. Although it comprises many of the same aspects as Green Finance, it only focuses on debt-based investment from banks, as a driver for sustainable initiative, environmental products and investment in policies that aids in the transition to a green economy.

2.2 The Pressure of Environmental Regulations

The introduction of new and intensified environmental regulations has put an immense pressure on the shipping industry, as with many other industries. There are direct and indirect effects of such regulations which are reshaping the industry. The timeline below presents the environmental legislations that have shaped humanity's perspective on the environment within the shipping industry and have contributed to noteworthy changes within the industry's working procedures. It should be pointed out that although many already existing and upcoming legislations are on environmental issues not all of them are on this matter. However, due to the nature of this study it is mainly the environmental protection regulations which play an essential part in the analysis that are included.

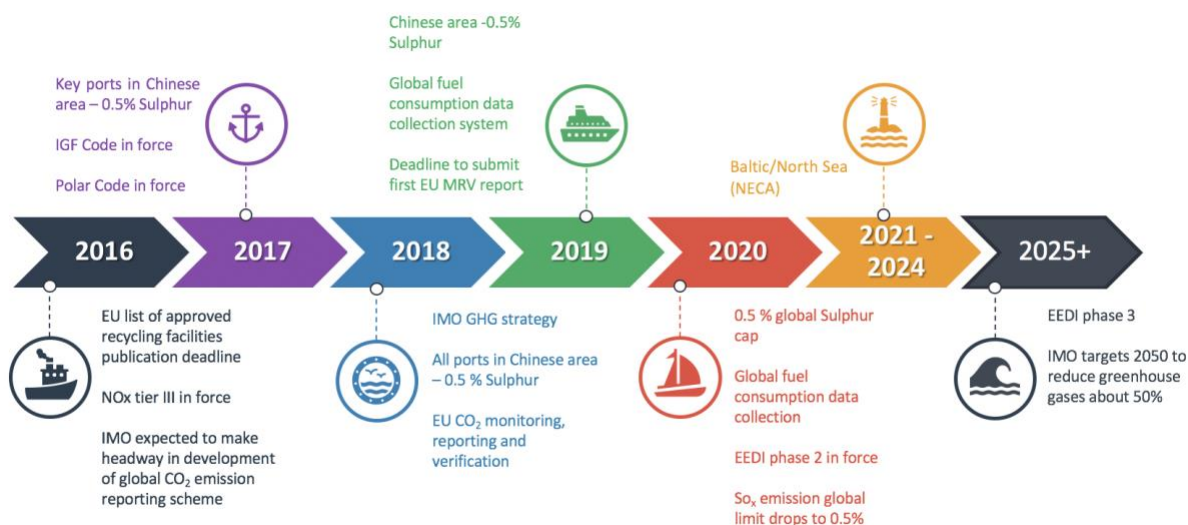


Figure 3: Timeline identifying important environmental regulations within the shipping industry

(source: DNV GL, 2019; Author's creation)

2.2.1 UN Sustainable Development Goals

United Nation (UN) Sustainable Development Goals (SDGs) play a major role in the new profound focus on the notion of sustainability. The SDGs were set out as a universal call to action with the purpose of ending poverty, protect the planet and ensure that all people enjoy peace and prosperity by 2030 (UN, 2020a). The prosperity aspect of the goals is added by the UN with the belief that all future solutions to the SDGs will generate economic growth. There is a total of 17 goals which are integrated, meaning that the action in one area will affect the outcomes in others (UN, 2020a). The actions further need to construct a balance between social, economic and environmental sustainability. There are several out of the 17 SDGs which plays a major role in the formation and structure of green debt financing. To reach the aim of many of the SDGs, large investments will be required especially for the shipping industry which currently rely on many environmental unfriendly resources.

One of the 17 SDGs which are important to the development of a green economy is the point to combat climate change and its impacts, namely goal number 13. This is considered one of the most important goals for financiers, as climate change is one of the main drivers of a greener economy. The shipping industry alone will need \$1 trillion of new investments to be able to reach the 2050 targets set by the IMO (Global Maritime Forum, 2020; Katsomitros, 2020). Such investments promote the reduction of CO₂ emissions and lead the way for new environmentally friendly technologies and infrastructures. The finance sector will play a major

role in the transition, with their main roles being the pricing of climate risks and the facilitation of investments in renewable energy and environmentally friendly technologies (Pedersen and Slette, 2016).

The SDG which is considered to have the most direct connection with green debt financing is goal number 8, which is set to ‘promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all’ (UN, 2020a). This goal further fosters the investment in greener technologies. It further drives the idea that all future investments should only be done if it contributes to global decarbonization. Goal 8 focuses on people to create a green economy. It is believed that for green growth to fulfil its promise, it needs to tackle poverty, inequality and exclusion that constrain both growth and environmental sustainability (Green Economy Coalition, 2017).

2.2.2 IMO 2050 CO₂ Reduction Cap

The International Maritime Organisation (IMO) adopted an initial strategy on the reduction of greenhouse gas emissions from vessels in 2018. It focuses on the commitment the IMO and the shipping industry has on reducing Green House Gass (GHG) emissions in a matter of urgency in order to phase them out as soon as possible (IMO, 2020). The goal is to make the GHG emissions peak promptly and to reduce the total amount of GHG emissions with at least 50 percent by 2050 compared to the 2008 levels (IMO, 2020). This regulation will play an essential role in the reduction of carbon dioxide (CO₂) emissions while also make green debt financing more attractive for the shipping industry. Due to the limited time the shipping companies have to transition, it is important for many to start with their green strategy. This includes the possibilities of increasing their green debt financing.

The regulation came into play as the shipping and aviation industry were originally left out of the Paris Agreement (International Chamber of Shipping, 2018). This created a lot of discussion, as the shipping and aviation industries account for about 5 percent of humanity’s total emissions and is considered the fastest growing source of emissions on a global level (Hulac, 2015). Thus, the IMO took action and created the IMO 2050 CO₂ regulation. The regulation includes a specific reference to ‘*a pathway of CO₂ emissions reduction consistent with the Paris Agreement*’ and is why the regulation is known as ‘*the Paris Agreement for*

shipping' (IMO, 2020). This is why the IMO 2050 regulation plays a major role in the reduction of CO₂ emissions globally.

2.2.3 The difficulty of having an environmental regulation for large ocean areas

The ocean covers 72 per cent of the Earth's surface, equivalent to 140 million square miles (UN, 2020b). It is the size of the oceans which makes the governance of it into a nebulous concept. There are several reasons why there is not a global sustainable ocean governance. The first reason is the subdivision of ocean areas, where each is under the responsibility of different institutions. According to the Convention of the Law of the Sea, adopted by the UN, the oceans areas are differentiated as follows: (1) *Territorial Sea*, (2) *Exclusive Economic Zone*, (3) *Continental Shelf* and (4) *the High Seas* (UN, 2020b). The issue with the different ocean zones is that they pose conflict to comprehensive sustainable ocean governance as fish stocks and toxic substances can travel across national borders. Further, as a consequence from climate change threats, all the zones are affected uniformly.

Another concern, which goes hand in hand with the first, is that there are too many institutions involved in the protection of the sea. There are countless different institutions in the different areas which is set in place to deal with the protection of the sea. These extends from national Governments to multinational organizations. Due to the fragmentation of responsibilities these organisations have, it makes it more difficult to ensure that the use of the ocean is done in a sustainable way (UN, 2020b). The various organizations and the different ocean zones make it difficult for national and multinational organisations to cooperate, as the regulations might be different in various parts of the world and not all countries agree on multinational regulations.

2.3 The transition from sail to steam and steam to diesel

The transition from sail to steam and steam to diesel engines are important to mention and look into, as it lays ground for the possibility of a new change in fuels for the current fleet. It further indicates the methods used to make such a large transition. This will highlight the opportunities and the risks with the upcoming transition to more environmentally friendly fuels.

2.3.1 Sail to Steam

The transition from sail to steam was an immense technological shift in the history of shipping (Armstrong and Williams, 2007). The transition process was gradual with the main driving

factors being the increased need of greater capacity, speed, reliability and safety. During the use of sailboats, sea routes were shaped by winds, however when the steamship came into existence it opened the opportunity to make new and efficient sea routes and shortened the time used. Although the transition was vital for the society, it was not cheap. The vessels were considerably expensive to construct, and the coal took up most of the space otherwise vacant for freight (Gatt, 2018).

2.3.2 Steam to Diesel

Steam and diesel engines embody vast differences when it comes to technologies. The transition from steam to diesel was therefore considerably problematic. It took around 40 years to move from the pioneering designs of the marine diesel engine to a near-complete dominance of that important transport niche (Smil, 2010). The reason for the long timeline was due to the weak economic situation, mainly owed to the world wars and the hostile situation following the war, therefore creating lack of financing for the owners looking to convert their fleet. There was a fuel shift from coal to oil which was the key in making the transition possible. The oil operated vessels did create an opportunity to have smaller crews and made it easier for vessels to refuel at sea (Andersson et al, 2014). Although the transition brought great technological and operational properties, it was considerably expensive to invest in the new technology.

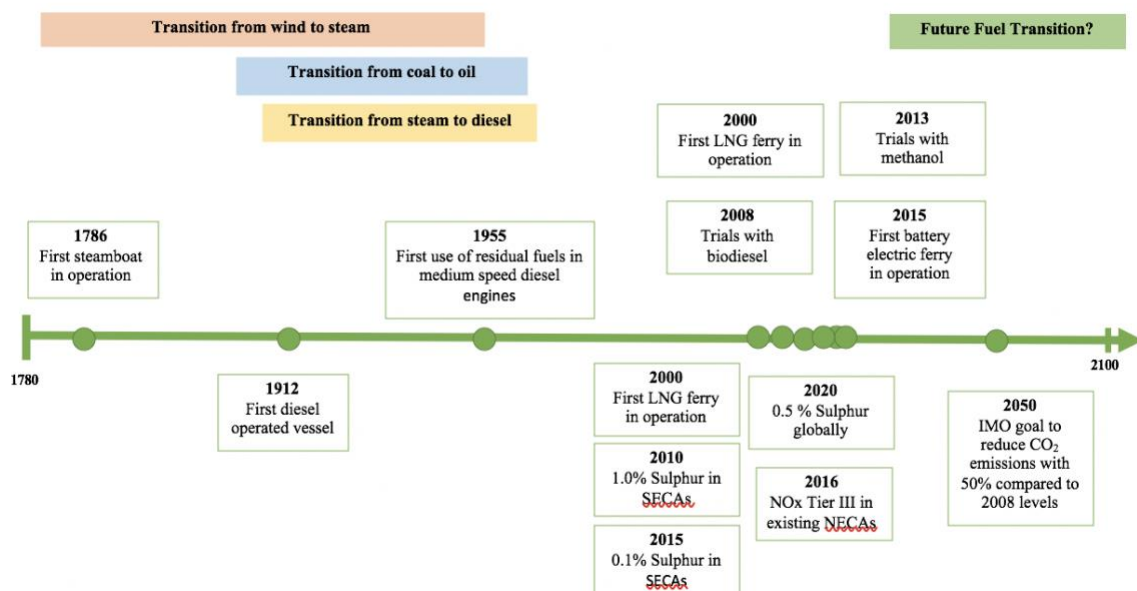


Figure 4: Timeline for transition of marine fuels from 1780 to 2100; with the most important events in the history of transition and environmental regulations which will emulate the future transition.

(source: Andersson et al, 2014; Author's creation)

2.3.3 What can history teach us about the upcoming fuel transition?

The transitions previously made make for historical precedents. Since the time of the transition from sail to steam, there has been a constant stream of scientific discovery and technological innovation, which are the primary reasons as to why there have been significant changes in the main shipping fuel sources over time. The most important features which should be considered as takeaways from the previous transitions are the speed of the transition, key drivers of the transitions and the intersecting of the fuel sources. Looking at *figure 4* it can be established that fuel transitions take approximately 50 years before establishing dominance over other sources in the market. This means that there is a shared speed of transition, suggesting that this might be the case for a low emission fuel source. Further, the transitions have many shared drivers, specifically economic growth, higher living standards and need for efficiency. However, one of the main drivers in the current ongoing transition is the importance of environmental mitigation, which has not been present in the previous energy transitions. The last feature is the intersection of the fuel sources over the years. It is important to note that after a dominant fuel source has been introduced to the industry it replaces the other one relatively fast. Looking at the previous section this would actually be proven to be the opposite. The main takeaways to note with the future transition, comparing to the previous transitions, lies in the consumer behaviour and the stricter environmental regulations, as previous transitions were driven by economic gain, higher living standards and global mobility. While the future transition, as mentioned is mainly driven by the need for environmental protection. In addition, the present consumer has the ability to act faster, technology cycles are quicker, and the green imperative is massive suggesting that this upcoming transition might be easier.

2.4 The current financial system with the shipping industry; Description of the system and criticism on the current financing methods

Most financial institutes have invested in companies that have shared in substantial environmental impacts due to the former lack of focus on the environment. With the financial sector contributing with trillions of dollars. Debt financing is defined as ‘*the borrowing of a fixed sum from a lender, i.e. bank or non-bank financial institutes (NBFI), with the agreement that the borrowing party will pay back the principal amount along with the interest within a fixed rate and time*’ (Cremades, 2018). The current criteria of most loans are the purpose of the loan, the business experience a company has, the business plan, previous credit history,

collateral and the cash flow of the party (Bai, 2011). These criteria play a major role in who is able to borrow and who is not. However, it is important to note that most financial institutions currently do not have any criteria which stops the investment in technologies that contribute to climate change. The current financial borrowing system thus is in need of a change in order to reduce harmful environmental impacts. The reduction of CO₂ is just not possible without the financial system. There is a need for new criteria which does not focus on the short-term returns of an investment, but also on the impact that investment makes.

There are various reasons as to why the current financial system allows the investment in companies and technologies that make for substantial negative environmental impacts. It is not because the lender is unaware of the environmental related risks, but rather the need for short-term returns and high hurdle rates with an overall imperfect financial matrix (Pedersen and Slette, 2016; Atherton, 2007). The focal point of the criticism is the short-termism which is inherent in the traditional debt decisions (Salter, 2012). Short-termism is described by Salter (2012) as *‘the preference for actions in the near-term without consideration of the long-term consequences’*. The short-termism is therefore considered a major barrier to reducing environmental impacts, as it can lead to *‘depression of economic development and destruction of long-term value, and there is a failure to adequately account for and invest in long-term environmental, social and economic sustainability’* (Pedersen and Slette, 2016).

The focus on the short-termism in a situation like COVID-19, is considerably difficult for the focus on the environment. Banks and organisations are now planning for the economic recovery from COVID-19, however for many this does not include a sustainable checklist (Hallegatte and Hammer, 2020). In a situation like this, the environment has a tendency to fall on the back burner while the world waits for an economic growth. Nevertheless, COVID-19 has shown that the environment actually improves when many industries are set on pause, i.e. the aviation industry. Thus, it is interesting to see if COVID-19 will give a push towards a sustainable checklist of criteria that can both boost economic growth and reduce environmental footprints. COVID-19 might be the turning point for many banks to look further into the purpose of the loans they are giving out. The current pandemic has not only shown how pauses in certain industries lead to a better environment. It has also expressed the need for countries to come together in order to stop the spread of the COVID-19 virus (Schwartz, 2019). The need for a global approach to the current pandemic has shown how vital it is for the world to come together in order to overcome the difficult situation. Comparing the current situation to the

environmental pressures the world is currently seeing, the two situations expresses some of the same issues such as the need for a global approach to the matter.

One of the most important trends to note in the current financing available to the shipping industry is that the importance of traditional banking is decreasing. Allowing alternative methods of financing to flourish. Observing the Petrofin Global Index, which monitors the global bank ship finance position, it is clear to see that even though the size of the global fleet has increased the Index has fallen (Petrofin Research, 2019). Suggesting that the global fleet has been funded from other sources then the traditional ship banking or that there is an overall lack of funding for the shipping industry (see figure 5).

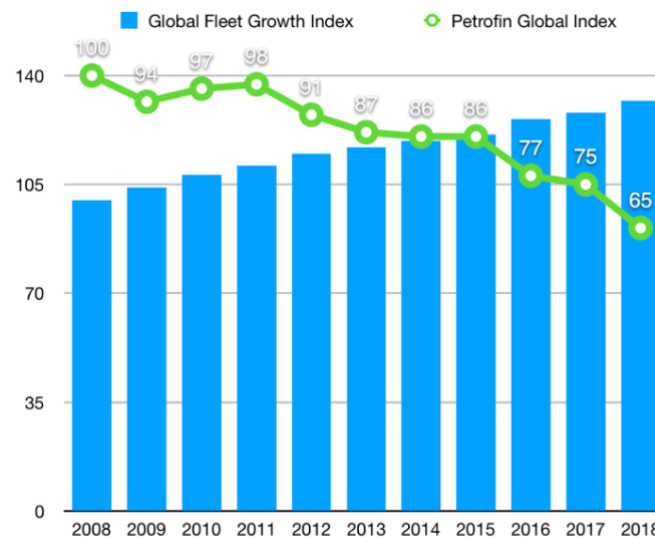


Figure 5: Graph showing the Global Fleet Growth comparing to the Petrofin Global Index in order to identify the financial trends within the industry

(Source: Petrofin Research, 2019)

From this graph it is clear to see that the Petrofin Index has fallen with 13 percent since 2017, while the global fleet has grown by 3.12 percent. Further supporting the fact that the majority of the current fleet is acquired by non-banking sources (Petrofin Research, 2019). The reduction in the traditional ship financing from banks has resulted in more alternative sources of finance, some green and some not. The reduction in traditional bank finance also stem from the 2008 financial crisis. Due to the global financial crisis there was an increase in the banking regulatory environment, especially within the European banks. Bank regulations such the Basel regulations have played a key part in the reduction of the traditional bank funding in the shipping industry. This is due to banks needing to maintain equity on their balance sheet against the financing of assets, which is difficult to uphold in such a volatile market as the shipping

industry (EDF, 2020). This has fostered the increase of the alternative sources of finance, such as high-yield bonds, convertible bonds, capital and operating leases, in addition to the preferred equity structures (Norton Rose Fulbright, 2017; Landberg, 2019). As mentioned, some of these new funding trends include green financing and is becoming gradually more important to the shipping industry.

One important thing to note is that the financial crisis and a systemic environmental crisis have some analogies which expresses the importance of green debt financing. Pre the 2008 financial crisis investors acted with some degree of rationality and predictability in line with their self-interest (EDF, 2020). After the crisis, it is seen how the collective sum of individuality rational actions has undermined the interest of the whole banking system and indeed led to major disruption (EDF, 2020). Moreover, as mentioned earlier, the individual financial behaviour is focusing on short-term prospects, whereas environmental risks are of a long-term nature (EDF, 2020). The following sub-chapters will look into the emerging concept of green debt financing and thus express the importance of the concept.

2.5 The current green debt financing available

2.5.1 The emerging concept of sustainable investments

There has been an increase in the interest of obtaining sustainable portfolios, which minimizes environmental impacts and social risk, from various financial services. There is no possible way of real transformation unless the financial playing field changes. The increased focus on green finance will ultimately enable the current carbon intensive economies into a green economy. The UN defines a green economy as ‘*an economy that results in improved human well-being and social equity, while significantly reducing environmental risks and ecological scarcities*’ (UN, 2020a). In the Global Green New Deal, introduced by the UN, and the SDGs the focus on reducing environmental impacts is driven by the public and private investments that are able to reduce carbon emissions. It is further important for these financial institutes to reflect on their willingness and recognize the existing inadequacies to initiate improvements in regard to green debt financing (The Governance Group and DNB, 2019).

The emerging concept of green debt financing is especially important for the shipping industry. To reach the 2050 target set by the IMO, the shipping industry would need large sums of investments, as mentioned previously, and they need such investments immediately. The life

span of a vessels is 20 to 30 years, thus a vessel entering the market around 2030 can be expected to be operation until 2050 (Global Maritime Forum, 2020; Petropoulos, 2019). Another major issue is that infrastructure linked with fuel supply chains can have a long economic life of up to 50 years (Global Maritime Forum, 2020). Due to this, the vessels entering the fleet by 2030 should be commercially viable, technically feasible and, most importantly, safe zero emission deep sea vessels. This further need to be supported by the clear path of providing vast quantities of zero carbon energy sources (Conde, 2019). The decarbonisation of the shipping industry is an integral part of the wider global energy transition (Global Maritime Forum, 2020). This is why it is believed that the shipping industry can be a driver of a green economy.

It is the loan purpose criteria from the current traditional banking loans which will play the greatest role when it comes to green debt financing. The purpose will be more focused on the opportunity a business has to reduce their environmental footprints. This will be at the core of the emerging concept of green debt financing. The purpose is thus considered to emulate a broader purpose than the traditional bank loans currently do. The foremost differences of the criteria and objective between the conventional and environmental method are described in the table below (Martinez et al, 2020). During the 2008 financial crisis the conventional banks main issue was the speculative transactions, which are refrained from in environmental banking, thus creating a strong long-term relationship rather than focusing on a short-term basis (Martinez et al, 2020).

Feature	Environmental banking	Conventional banking
Objective	Triple bottom line: Profit, people and planet	Profit-maximizing to reward shareholders
Profit	A means to and end	An end in itself
Investment object	Only on real economy	Speculative transactions
Investment criteria	Positive screen (environment, employment creation, culture, etc.) and negative screen (armament, polluting companies, etc.)	Profitability and risk
Loan policy	Avoid financial exclusion	Exclusion of specific segments of the society
Transparency	Total transparency of information and allocation of assets	Lack of transparency
Geographical distribution	Low number of branches	High number of branches

Table 1: The different features environmental banking and conventional banking present

(source: Martinez et al, 2020)

2.5.2 *The current methods of green debt financing*

There are various methods of acquiring debt for the financing of projects and investments, however, it is the banks that play the major role in the shift to a green economy. Due to their role, many nations and states have integrated Green Investment Banks (GIBs) which are set to mobilise investment from the private sector to meet the climate change goals (OECD, 2015). The GIBs are drivers of much of the green debt financing which invests in climate resilient infrastructure (OECD, 2015; OECD, 2017). The creation of the GIBs sends signals to countries across the world and to the different marketplaces that a country is seeking to become the leader in decarbonization technology and thus foster the idea of green debt financing. The GIBs have criteria which focus on the reduction on environmental footprints and does not share the short-term focus many of the current private lenders do. The banks share in a sustainable communication, which is important to attract the right investors and the implementation of Environmental, Social and Corporate Governance (ESG) factors (Pedersen and Slette, 2016; Evans et al, 2017). It is such criteria and the sustainable communication which differs it from the current financial debt system. The GIBs will ultimately help show that it is possible to improve their sustainable performance while getting profitable returns (Pedersen and Slette, 2016; UNEP, 2011). This will hopefully motivate other financial institutions to assume a sustainably accountable behaviour.

The UK Green Investment Bank (GIB) is considered by many to be the most established GIB globally. This GIB was launched by the United Kingdom Government in 2012 and was considered to be the first institution of its type (Green Investment Group, 2017). According to the Green Investment Group, the bank *‘is a publicly funded bank designed to mobilize private finance into the green energy sector’*. This GIB is mainly focused on UK green infrastructure projects and between its introduction and 2017, the UK GIB helped finance more than 12 billion pounds of such projects (OECD, 2015; Hansen, 2016). Another important investment bank which plays a major role in the push towards green financing is the European Investment Bank (EIB). The EIB is one of the world’s largest multilateral provider of finance for projects supporting climate action (EIB, 2020). Compared to the UK GIB this specific bank operates on a global level with projects in over 160 countries. The bank is committed to stop financing anything related to CO₂, in order to keep the global warming well below 2 degrees Celsius. Table 2 further looks into the various green investment banks currently existing and their

different features in order to see what they cover. The various GIBs gives an overlook on how many levels the banks can exists on, due to the initiators of the banks and the target sectors in which the different banks are concentrating on.

Although the GIB are fairly new banks which all have the main purpose of aiding in the green transition, these are not the only banks which are focused on one main purpose. For instance, after the fall of the Berlin Wall the European Bank for Reconstruction and Development (EBRD) was created to aid in the transition towards open market-orientated democratic economies in the countries of central and eastern Europe (Klipatrick, 2020). The bank later assisted in other damaging events and continued to focus on their main purpose of deliver development impact with sustainable financial returns (Klipatrick, 2020). Another important bank with a purpose would be the KfW in Germany, which was set in place to rebuild east Germany. The history of banks with their main purpose being on one main issue illustrates just how important green investment banks are to aid in a green transition.

Green Investment Banks worldwide						
GIB or GIB-like entity ¹	Public-Private ratio	Financial Instrument			Initiator	Target Sectors and Sub-sectors
		Loans	Grants	Other		
UK Green Investment Bank	1:3/1:10-1:20	*			UK Government, Department for Business, Innovation and Skills	-Offshore wind -Waste recycling & bioenergy -Energy efficiency -Small -scale renewables -Other ² clean technologies
The Green Finance Organisation Japan	N/A	*			Japanese Government, Ministry of Environment	-Low-carbon projects ³
Green Tech Malaysia	N/A	*	*		Ministry of Energy, Green Technology and Water	- Renewable energy -Water and waste management -Building ⁴
Clean Energy Finance Corporation (CEFC) (Australia)	1:2/1:10	*		Venture capital	Australian Government	- Renewable energy -Low emissions and energy efficiency (50%)
Technology Fund (Switzerland)	1:1			Guarantees	Swiss Confederation	-GHG reduction technologies -Energy efficiency -Renewable energy Natural resource conservation technologies
Masdar (United Arab Emirates)	N/A	*		Venture capital	City of Masdar	-Clean energy -Energy efficiency -Carbon capture and storage

¹ “**GIB-like entities** is according to OCED (2015) considered to refer to organisations that have a mandate to leverage private finance for domestic LCR infrastructure investment, but which may not possess all core characteristics of GIBs, and may pursue other activities or use other approaches (for example grants)” (OCED, 2015).

² Other clean technologies in this case includes **biofuels for transport, biomass power, carbon capture and storage, marine energy and renewable heat** (OCED, 2015).

³ Such projects include **wind, solar, small-scale hydro, biomass, waste management, geothermal, hot springs, renewables of mid-sized hydro** (OCED, 2015).

⁴ E.g. **energy and water efficiency, indoor air quality** (OCED, 2015).

Green Energy Market Securitization (Hawaii)	N/A	*			State of Hawaii, Department of Business, Economic Development and Tourism and the Hawaii Green Infrastructure Authority	-Low and moderate-income homeowners, renters and non-profit -Distribution solar PV -Clean energy and energy efficiency
Connecticut Green Bank	1:10	*		Securitization, leasing	Connecticut's General and Governor	-Energy efficiency -Renewable energy -Other clean technologies
NY Green Bank (New York)	1:5	*		Credit enhancement	New York State Energy Research and Development Authority	-Energy efficiency -Renewable energy -Other clean technologies ⁶
New Jersey Energy Resilience Bank	N/A	*	*		State of New Jersey	-CHP, fuel cells and solar-tied storage at water and wastewater treatment
California Lending for Energy and Environmental Needs	N/A	*		Tax-exempt bonds	The California Infrastructure and Economic Development Bank	- Municipal clean energy projects - Clean electricity - Energy conservation, environmental mitigation and water treatment
Rhode Island Infrastructure Bank	N/A	*			Rhode Island General Assembly	-Remediation of contaminated brownfield sites -Clean waters and clean drinking water -Clean energy -Municipal renewable energy projects
Montgomery County Green Bank	N/A 1:20			N/A	Department of Environmental Protection	-Clean energy, including energy efficiency and renewables
South African Green Fund	N/A	*	*	Equity	South African Government, Department of Environmental Affairs	-Conservation friendly land use/focus on more wildlife-friendly livestock farming practices -other low carbon, resource efficient and climate resilient developments

Table 2: Green Investment Banks worldwide with their features

(Sources: Pedersen and Slette, 2016; OECD, 2015)

It is however important to note that commercial banks are also contributing to green debt financing. As commercial banks play a major role in the financing of the economy, they thus also play a direct role in contributing to the three dimensions of sustainability: environmental, economic and social (EBF, 2017). Banks have a unique role in the transition as they have a unique position in facilitating the capital flows through their lending, investment and advisory to the economy (EBF, 2017). The more environmentally friendly technologies created, the more involvement of commercial banks is being recognized. Many commercial banks have established green policies which ought to ensure that all or most investments guarantee that it will contribute to environmental sustainability (European Commission, 2020). However, it is considerably difficult at the moment to certify that banks are actually following through with this policy, and for many banks it is impossible to know how large of a contribution an investment will have on the environment as it is the companies which banks invest that

⁵ Technologies include *combined heat and power (CHP), anaerobic designs, fuel cells, alternative fuel vehicles and infrastructure, storage* and others (OCED, 2015).

⁶ Technologies such as *CHP, electric vehicle infrastructure, fuel cells and offshore wind* (OCED, 2015).

ultimately control the contribution to the environment. The increase in green policies within the banking sector is nevertheless a crucial step in the right direction when it comes to environmental protection. The contents of the green policies within the banking sector is currently dependent on each individual bank.

2.5.3 Some of the organizations and governments which are currently supporting green investment

The importance of reducing environmental impacts have made many financial institutions, companies and multinational organization aware of the need of changes. There are currently various organizations, both privately and public owned, which have made the switch to green debt financing in order to foster a green economy. Some are directly linked to the shipping industry while others play an overall major role in the financial sector. Although these organisations have a significant different focus points and ownership, they all share the common goal of pushing towards green financing. The following organisations and banks lead the way towards a green economy:

- Poseidon Principles

The Poseidon Principles were introduced to create a global framework for responsible ship finance by integrating climate considerations into financial institutions' lending decisions (Poseidon Principles, 2019). The main aspect of it, is the establishment of a shared global standard when it comes to the quantitative assessment and making sure that the financial institutions are in compliance with the set climate goals. There are currently 18 financial institutions which are signatories. When joining the Poseidon Principles, signatories promise to use the Principles through their internal policies, procedures and standards, while constantly working with their clients and partners in order to implement the Principles (Poseidon Principles, 2019). These 18 financial institutions represent a global shipping bank loan portfolio of approximately 150 billion dollars, which is considered more than a third of the global ship finance portfolio (Poseidon Principles, 2019).

- The getting to Zero Coalition

The Getting to Zero coalition is an alliance consisting of over 90 companies within the maritime, energy and infrastructure and finance sectors (Global Maritime Forum, 2020). It is supported by governments and intergovernmental organizations (IGOs), which all are committed to contract commercially viable deep sea zero emission vessels. Their goals are that

these vessels should come into operation by 2030. To meet the goals set by the IMO it is important to invest in zero emission technologies. This will further require the development of the vessels as well as the fuel supply (Global Maritime Forum, 2020). The development of the new fuel supplies can only be done with the collaboration between the maritime industry, the energy sector, the financial sector and governments and IGOs (Global Maritime Forum, 2020).

- *Sustainable Shipping Initiative*

The Sustainable Shipping Initiative (SSI) is a multi-stakeholder initiative which share in the goal of improving the sustainability of the shipping industry in terms of social, environmental and economic impacts (SSI, 2020). They see this as an urgent need and believe that the shipping industry should reshape the way their business is conducted. The SSI goals are all set in place to support the roadmap to a sustainable shipping industry by 2040. One of the goals being the *‘development of financial solutions that reward sustainable performance and enable large scale uptake of innovation, technology, design and operational efficiencies’* (SSI, 2020).

- *European Union (EU) taxonomy*

The EU taxonomy is set in place as a tool for investors, companies, issuers and projects promoters to help in the transition to a green economy (EU, 2020). The EU taxonomy embodies six environmental objectives, namely;

1. *Climate change mitigation;*
2. *Climate change adaption;*
3. *Sustainable and protection of water and marine resources;*
4. *Transition to a circular economy;*
5. *Pollution prevention and control;*
6. *Protection and restoration of biodiversity and ecosystems.*

There are various performance thresholds which are set in place to support the transition. These thresholds will help parties’ access green financing to improve their environmental performance. The thresholds are as follows; (1) *the substantive contribution to one of the six environmental objectives*, (2) *do no significant harm to the other five, where relevant*, and (3) *meet the minimum safeguards of the Organization for Economic Co-operation and Development (OECD) guidelines and the UN guiding principles* (EU, 2020). It will further support the identification of the activities which are already environmentally friendly. The EU

taxonomy is currently one of the most significant developments in sustainable finance (EU, 2020). It will aid in the concept of green debt financing.

Chapter 3. Methodology

This chapter outlines the methods utilized to conduct the research needed for this thesis. It further entails the research methods and tactics adopted by the researcher in order to gather essential data for the scope of the thesis. Reasons, explanations and justifications for the research design, research analysis and limitations of research are given to make the understanding of the following chapter easier for the reader and researcher. This chapter is essential to understand how the research questions and objectives were answered with the data gathered.

3.1 Research design

Research design is a plan for a study for conducting and managing a research project, such as a thesis project (Heppner et al, 1992). The design of the research is considered to be the blueprint which describes in detail the method of the tactics for managing the author's research (Heppner et al, 1992). There are two main common approaches which can be used when researching a thesis scope according to Saunders et al (2009), namely the deductive and inductive approach. The deductive approach is where theoretical propositions are tested by the researcher by using already existing literature and data, while the inductive approach focuses on acquiring detailed observations which will support the research by formulating theories (Saunders et al, 2009). This research will mainly focus on a deductive approach as the thesis scope focuses on already existing theory that is gathered from numerous models. By using this specific method, the thesis creates a 'new' hypothesis of understanding if green debt financing can aid in the compliance of the 2050 IMO regulation on reducing GHG emissions by 50 percent. After the hypothesis the result is then tested against the primary and secondary data used in this thesis.

3.2 Data sources

The thesis uses a mix of both qualitative and quantitative data, as well as a mix of both primary and secondary data. While the research is mainly based on a qualitative approach, it was essential to incorporate quantitative data as it will help highlight the current financing available to the shipping industry, ranging to the thresholds seen in the various environmental regulations (Saunders et al, 2009). However, as mentioned, the qualitative data played the prevalent role

in the research and process of this thesis, the qualitative data was predominantly gathered and analysed through previous studies on the role of green debt financing available to the shipping industry.

The mix of primary and secondary sources was used to collect an in-depth gathering of information, which is relevant and up to date to today's shipping industry. The secondary data was collected through a documentary form. Via this type of data, the researcher has utilized pertinent reports, literature, websites and journal articles as focal secondary sources. The various forms of secondary sources used in this research range from various disciplines, such as the maritime industry, corporate research, environmental science, etc. To be able to find the relevant sources certain online databases have been conducted, these are considered to be the IMO, the EU, OECD, the UN and the Global Maritime Forum. The following combination of keywords are used to locate important papers; green debt financing, green investment banks, green funding in the shipping industry, the IMO 2050 regulation and alternative fuels available to the shipping industry (*see appendix 1*).

In combination with the secondary sources gathered, this research uses key primary sources in order to acquire information which offer insight and knowledge which secondary data cannot. To gather the primary data, surveys are used as these offer information on market participants observations and insight according to Baker et al (2011). It is further suggested by Graham and Harvey (2001) that surveys work as gap closer between the theory presented and the actual reality of an industry. The questions were asked in a semi-structured manner consisting of both open ended and close ended questions, as this allow for a more diverse research. The open-ended questions required longer answers which permits more freely answers that allows for more discussion on the topic and makes it is easier to acquire in-depth primary information (Saunders et al, 2009). The surveys were sent out by email to allow for effective time saving for the respondent and more thoughtful consideration of the question from both the perspective of the interviewer and the respondent.

3.2.1 Interview Process

For the purpose of this thesis research, it was important to create a wide portfolio of participants by sending the surveys out to industry professionals such as shipping companies, banks and other organisations that all have extensive experience in the industry. There was a total of three

surveys made; one tailored for banks, one tailored for shipping companies and the last was tailored for organisations (*see appendix 2*). In total 58 participants were sent the surveys via personal email, company websites and LinkedIn. Several of the participants were proposed by the supervisor of this project, Mr. Gust Biesbroeck, or the researcher and lastly ‘random’ parties. The process of the interview went over an extensive period of time, between 25th of July to the 31st of August, to hopefully permit a larger response cluster. However, during the period of the surveys the results were continually analysed to cut down the time of the writing phase later on. The surveys were sent out a maximum of three times to the participant on the initial list, as it gave room for an increase amount of responses. At the end of the survey period, the responses to the surveys were as follows: 7 from banks, 11 from shipping companies and 4 from organisations. With regards to the banks, most of them had extensive involvement in the shipping industry and/or in green financing. The shipping companies were based in various segments within the industry, namely logistics, shipowners, broker and operators. Lastly the organisations which the survey was sent to were either directly connected to the shipping industry or had influences when it came to environmental issues. It is however important to note that although the type of establishments that the surveys were sent to is identified in this section, all the personal information about the participants will be used anonymously throughout this thesis.

3.2.2 Structure of questions

As mentioned previously, the questions in the surveys are semi-structured. Each survey is considered to be structured interviews, however due to the fact that there were three different surveys with both various and similar questions the whole structure of the questions are considered to be semi-structured (Saunders et al, 2009). The questions are structured so the information collected from them would answer the main research question and the following sub research questions. Overall the different surveys include the same parts when it comes to the layout, but as mentioned have some variety when it comes to the questions. The layout of the different surveys are attached in *appendix 2*. The first part of the surveys, namely the introductory part, is not included in the analysis and results as this contains personal information about the participants. This part includes names, position, company name and size of shipping portfolio and thus has no meaningful relation to the outcome of the research.

The second part is named policy and speak to how the different companies are contributing to the green transition by asking about the promotion of green debt financing. From this section the researcher can obtain most of the answers related to the background of the topic. In this section the various questions are both open ended and closed ended questions. This is done as the open-ended questions allows for in depth information which can explain the reasons behind the answers, while the closed ended questions make it easier to compare the answers of the participants across the different surveys. The third part of the surveys are considered to be the most detrimental to the research of this project. This part is called impact and includes how important different collaborations and the overall green transition is to the different professionals which were sent the questionnaires. This section further elaborates on the research questions as it includes questions that are directly connected to them, such as the following 1) *what are the largest barriers to green debt financing*, 2) *do you believe green debt financing is essential for the shipping industry in order to be able to meet the standards of the 2050 IMO regulation on reducing GHG emissions by 50%*, and 3) *how do you believe green debt financing will impact the future of shipping?*. These questions are as the second section, both open-ended and close-ended questions. The open-ended questions are to get in depth information from the participants on what the shipping industry exactly needs to aid in the green transition. The closed-ended questions are mainly to measure how different factors affect the shipping industry and to what degree the factors play a role in the green transition from the various professional's perspectives. The 2nd and 3rd sections of the questionnaires thus addresses the most important information needed for this study and helps answer the research questions.

Note that the last section of the survey, namely the respond summary, is not used in the analysis and result as it refers to if the responders to the questionnaires would like to have a summarized report on the results from the different surveys, and thus play no role in the research.

3.3 Limitation of research

There are a few limitations which are identified in relation to this research. These are important to mention to make it easier for future studies to understand what to focus on. One of the key limitations within this project was the fact that it was only feasible to look into one type of green investment method, namely green debt financing in this case. As a result, the various other green investment methods are not taken into consideration, some examples of financing methods which should be included are the following green financing from private investors

etc. It is further important that some answers to the surveys might be considered bias, as business information often is commercially sensitive and therefore participants of the surveys might be hesitant to answer questions that might give out such information. Nonetheless, the questions were mostly designed so the participants would not need to give out such information. One major limitation to the thesis process was that some of the people contacted regarding the bank survey, were on block leave. This was mainly due to the COVID situation, and thus some were unable to log into the business email from home.

The researcher met some limitations when it came to gathering the quantitative information. This is due to the fact that much of the information on the topic and on the corporations researched have data no later than 2018. It is however vital to include these as they establish the background of the research of the project. Such information is for example the traditional funding available to the shipping industry versus the growth of the fleet and economic numbers of both the Dutch and Norwegian economy. Finally, it is vital to limit the findings of this research to the date of the project issuance, as developments and data on the topic of green financing is continuously updated and renewed.

Chapter 4. Case Study

The Netherlands and Norway has been analysed on various environmental and financial aspects in order to create an overview of the possibilities of green debt financing and further understand the need of specific policies and criteria when it comes to the continuously developments within green debt financing. Further, the importance of the shipping industry within the two countries is presented and the green debt financing already available to the industry is analysed to give an overview on the possibility of a green economy. The reason why the financial, political and environmental situation of the countries, outside the shipping industry, is presented is to be able to understand how their current features are similar to make a fair comparison. If one of the countries had been analysed against another country which does not share similar features, then the comparison would not be appropriate.

4.1 The role of shipping in the two different nations

Both the Netherlands and Norway are considered to be great shipping nations. The two countries are a few of the countries in the world which consist of a complete maritime cluster, consisting of seafarers, ports, shipyards, leading international shipping companies, equipment manufacturers, vessel designers, brokers, classifications societies, providers of insurance,

providers of finance, and strong environments for development and research (Norwegian Shipping Association, 2019). Further both countries have open economies which allows for a strong position within the maritime industry. The Netherlands has succeeded in creating their nation into a strong global maritime power. One of the main reasons why the Netherlands has become a successful shipping nation is due to their strategic position at the estuary of the rivers Rhine, Meuse and Scheldt (Government of the Netherlands, 2015). Rotterdam, situated in the South of Holland, is considered the gateway to Europe as it is the home of the largest port on the continent. The Dutch shipping industry allows for the country to be one of the world's top ten leading exporters.

Norway controls one of the top ten largest fleets, making Norway a major maritime power. The shipping industry is vital to the Norwegian transport industry, and for the transport of export products (the Norwegian ministry of trade, industry and Fisheries, 2001). The history of the Norwegian shipping industry states all the way back to the Vikings, and it is the geographical area of Norway together with the maritime history which has allowed for the nation to flourish into one of the top global shipping nations. The two countries are considered to have the most valuable fleets in the world (see appendix 3). In addition, the role of the shipping industry in the two countries play a major role in the global trade and thus it can be stated that the maritime industry currently in place is one of the most important industries for both countries.

4.2 Financial situation

It is important to note that both countries are positioned in a considerably good economic situation, therefore allowing for better environmental solutions than numerous other countries. Further, it is important to observe that although the countries have considerably good financial positions, they do not share the same financial source. The Netherlands is considered to be the sixth largest economic power in the Eurozone and the fifth largest exporter of goods (Nordea, 2020a). The country is open to trade and consequently the global economic conjuncture (Nordea, 2020a). Main Dutch growth drivers includes domestic demand and exports. Their financial prosperity is based on international trade and geographic location making it a European trading hub, with Rotterdam as the largest European port (Nordea, 2020a). The international trade is considered to be the main pillar of the Dutch economy, representing 158 percent of Gross Domestic Product (GDP) in 2018 (World Bank, 2019). Making the Dutch economy one of the most open and outward oriented economics in the world (Nordea, 2020a).

The Norwegian economy is also considerably open, with trade representing 71 percent of GDP (World Bank, 2019). Although the Norwegian economy is considered to be very open, Norway is reliant on the exports of two specific products, making the Norwegian economy more vulnerable. The country is among the top 20 exporters of oil and the second largest natural gas and seafood exporter (Nordea, 2020b). The table below gives a visual comparison of some important financial aspects of the Dutch and Norwegian economy.

	The Netherlands	Norway
Foreign trade (in % of GDP)	157.7	71.1
Import of Goods (million USD)	644,673	86,600
Export of Goods (million USD)	723,752	121,791

Table 3: Important financial features of the economy of the Netherlands and Norway.

**Numbers from 2018. (Source: World Bank, 2019; Santander, 2019a,b)*

4.2.1 The importance of shipping for the two different nation's economies

The maritime cluster within the industry accounts for a direct added value of 18.6 billion euros for the Netherlands in 2018. With the indirect value added this number grows to 26.1 billion euros, which allows the maritime cluster to generate approximately 3.4 percent of the GDP (Maritime by Holland, 2019). Not only does it contribute to economic growth within the country, the cluster has a total of 276,877 people, with 167,181 people being directly labours (Maritime by Holland, 2019). This makes out a total of 3 percent of employment in the Netherlands (Loyens and Loeff, 2014). The most important figure is the total export number amounted to 33 billion in 2018, which accounts for a total of 7 percent of all Dutch export value with the total Dutch export amounting to 496 billion euros (Maritime by Holland, 2019). These numbers explain how important the shipping industry is to the Dutch economy. Therefore, it is vital to keep this industry thriving in order to continue to obtain these essential benefits.

The Norwegian maritime cluster creates a value of 13.46 billion euros. The value creation grew from 2017 to 2018, and although the numbers from 2019 are not out yet, they were expected to grow with around 6 percent in 2019 according to the Norwegian Shipping Association (2019). Similar to the Dutch shipping industry, the Norwegian shipping industry stands for a large number of employments. Within the Norwegian maritime cluster there are an estimated 85,000 people employed (numbers from 2018), which is an estimated 3.14 percent of the total Norwegian population⁷ (Norwegian Shipping Association, 2019). The nations numbers explain the importance of the shipping industries to the two countries, and further support the fact that both countries are keen on fostering the industry in order to keep the added values it generates to the countries.

4.3 Environmental goals

The Netherlands and Norway share in their increasing interest in the environment and are both recognized as major players in the reduction of environmental impacts. The Dutch and Norwegian government have both made it clear that expenditures related to climate change and infrastructure is one of their top priorities (Nordea, 2020a,b; Government of the Netherlands, 2020). To be able to reduce their environmental impacts both countries have introduced various substantial legislations and goals which are going to aid in the protection of the environment. Such environmental goals are presented in the table below, some are directly related to shipping while others contribute to an indirect impact.

⁷ Calculated by researching what the working population was 2,700,492 (number collected from Statistics Norway, 2020) at that time and then seeing what 85,000 is in percentage of that number. Thus; $85,000/2,700,492 = 0,0314 = 3.14 \%$

The Netherlands		Norway
Environmental Vision	Reduce greenhouse gas emissions with international cooperation at its core	Reduce environmental impact by ensuring the permanent place of sustainable development on the political agenda
Environmental Goals	<ol style="list-style-type: none"> 1. The Netherlands aim to raise the EU ambition for 2030 from 40% to 55% emission reduction compared to 1990, as this is considered to be essential in order to integrate growing supply of renewable energy sources 2. Promoting better technological solutions which can reduce greenhouse gas emissions 3. Subsidies for additional renewable energy capacity (wind and solar) until 2025; estimated 70% renewable share in electricity production by 2030. 4. Smart solutions will enable logistics to organise more efficient and sustainable transport. 5. Funding for innovation aimed at hydrogen and other sustainable fuels. 	<ol style="list-style-type: none"> 1. Actively follow up donor coordination on environmental issues 2. Participating actively in the international cooperation OECD-DAC, the World Bank and the UN strategic environmental assessments 3. Promote the integration of environmental and sustainable developments into recipient countries strategies, plans and budgets 4. Assist in developing legislations and environmental standards 5. Increase awareness in the private sector in Norway and globally of its responsibility for operating in accordance with the principles of sustainable development

Table 4: Environmental Goals of the Dutch and Norwegian Governments

(source: Governments of the Netherlands, 2020; Norwegian Government, 2019)

4.3.1 Environmental goals specifically for the shipping industry

There are environmental regulations within the different nations that apply directly to the shipping industry. Previously the global regulation effecting the shipping industry is presented. It is however important to present the national regulations as well, as these give an indication on how important environmental issues is to the country and other parties within the industry. There are important Dutch national and local regulations which are set in place within the country. Due to the size and importance of the ports of Rotterdam, Vlaardingen, Schiedam, Dordrecht, Papendrecht and Zwijndrecht they all have byelaws regarding environmental protection. All of these ports share the designation decree for fuels and energy sources that may be bunkered with a permit only, thus making sure that all fuels and energy sources are accounted for and consequently minimizing the risk for environmental damage from dangerous fuel sources (Port of Rotterdam, 2020). There are other national regulations in work, which

will reduce the emissions of Nitrogen Oxide (NO_x) within the Dutch waters. One being that river barges need to incorporate Tier III to reduce the NO_x emissions.

Norway has over the last few years focused on creating a more environmentally friendly environment within its geographic area. Norway has an issue with air circulation along the coast because of to the formation of the country (DNV GL, 2018). The country experiences temperature inversions when the temperature is low and there are low levels of wind, an inversion layer is created that traps smog close to the ground in certain areas (DNV GL, 2018). The inversions can often be seen in Norway due to the cold temperature present as it is located in the polar region. Due to this issue, the Norwegian Government has focused on setting in place regulations that will make the domestic maritime transport sector emission free. The most significant domestic shipping regulation is adopted by the Norwegian Government so to achieve zero emission from cruise ships and ferries in the Norwegian world heritage fjords no later than 2026 (UNESCO, 2018; Launes, 2018). The country is currently also focusing on making the Port of Oslo an emission free port. Although this is not a set regulation with a specific time frame, it is an important goal for the country.

4.3.2 Increase in environment protection - lawsuits

The pledge made by political parties to protect the environment is very difficult to uphold, as reducing environmental hazards often require collaboration on a vast level. Thus, some of the environmental goals set by the governments are difficult to meet in time span set. This has caused somewhat of an issue for both the Dutch and the Norwegian government.

In 2013 an environmental group, called Urgenda, filed a lawsuit against the Dutch government with almost nine hundred co-plaintiffs. The lawsuit stated that the government was breaching human rights, as they were not doing enough to meet the environmental target set by themselves. This case was ground-breaking, because when they won the case in the Hauge District Court in 2015, the government was ordered to reduce greenhouse gas emissions by at least 25 percent from the 1990 levels in the following five years (Schwartz, 2019). They won the case by stating that the damage that could occur to the current and future generation was so great that the government had to give duty of care by reducing the emissions promptly (Schwartz, 2019). The Dutch government appealed the ruling, but again in 2018 they lost and was prompted to reduce their emissions by at least 25 percent by the end of 2020. The case was

further taken to the supreme court where the procurator general and advocate general advised the court to reject the governments arguments, which failed and Urgenda won again.

This case paved way for many other organisations to do the same in their countries. ‘Norway’ was one of the countries which were inspired by the case. Nature and Youth (Natur og Ungdom) and Greenpeace Norway set out to sue the Norwegian Government for granting a new oil licenses in the Artic Barents Sea. The two groups stated that by handing out such licenses the Norwegian Government went against the Paris climate agreement and violated the right to a safe and healthy environment for the current and future generation (Klimasaksområdet, 2020). The Norwegian Government won the case twice since then, but the environmental groups have taken the case to supreme court in hopes that they will have a better chance there. The outcome of this case is thus not determined yet.

4.4 Political Contribution

The increased interest in environmental protection has led to political awareness regarding the issue. Thus, more actions are being taken than ever before. Both in the Netherlands and in Norway political parties which have their main focus on environmental protection have engaged in the discourse. As people become more aware of the increasing health hazards and other effects of the deteriorating environment, individuals are willing to bet on a new party in order to reach the environmental goals. In Norway it is the Green Party (Miljø Partiet de grønne) which are gaining a major following due to their focus on the environment. In the Netherlands it is similar, where the GreenLeft (GroenLinks) has paved its way into the political arena. Although the parties were established a few years ago, it is first now they are getting room in the parliament. However, it should be pointed out that both the Netherlands and Norway are both countries that have strong financial and social portfolios which is making it easier for these two countries to shift focus onto the environment on the political arena.

The political involvement on the topic has led to the implementation of certain important national and international regulations and goals that contribute to the reduction of environmental impacts. The goals set by the Dutch and Norwegian government is presented in table 4. These action plans set the foundation of the road map to a better environment in both countries, however this is only if the governments are able to meet the certain goals by implementing ‘small’ solutions. The political situation in the two countries explains the

openness to the concept of green debt financing. This is because the increase in green politics identified within the countries allow them to introduce green solutions and further support the surge of environmental awareness amongst the population.

4.5 Overview of Dutch and Norwegian Banking sector

The bank systems in the Netherlands and Norway are considered to be somewhat different. Norway consists of more small regional banks, while the Netherlands have fewer banks, but of greater size. There is also a difference in what the various national banks focuses on. In Norwegian banks the focus is on investing in the already well-established industries, like fish, oil and gas, while the Dutch banks have a more diverse portfolio (Dutch State Treasury Agency, 2019). Currently the largest industry which Norway focuses upon is mining and quarrying, namely oil and gas, with 27 percent of their foreign direct investment going there (Santander, 2020a). Their main focus is on financial and insurance activities, with a total of 47,3 percent of their foreign direct investment going there (The Norwegian Shipping Association, 2019). Only from these two numbers it is clear to see that the Dutch investment portfolio is more diverse, as the Netherlands focuses more on financial trading than Norway.

4.5.1 Banking systems currently available to the shipping industries

However, as it has already been established, the shipping industry generates large added value for both countries. Therefore, Dutch and Norwegian banks have established units that only focuses on the maritime cluster. In a ranking collected from the Global Maritime Hub, Oslo, Norway comes in 3rd place while Rotterdam places as the 7th when it comes to Maritime Finance and Law (see appendix 4). Oslo's robust maritime finance position is mainly owed to their strong historical position already discussed and the development of leading global finance services which have supported the industry (Menon Economics and DNV GL, 2019). Oslo, Norway, is home to two leading shipping banks, namely DNB and Nordea. Rotterdam is behind Oslo when it comes to maritime finance. However, it is still a leading city in this aspect with a 50 percent increase in loan value from 2017 (Menon Economics and DNV GL, 2019). Two of the Dutch banks which play a sizeable role to the industry is ING and ABN AMRO which have boosted their bookrunner loans over the last few years (Menon Economics and DNV GL, 2019). The top 25 bank lending sources to shipping is presented below, from this it is clear to see that the two Dutch banks previously mentioned, and the two Norwegian banks previously mentioned are all present on this list.

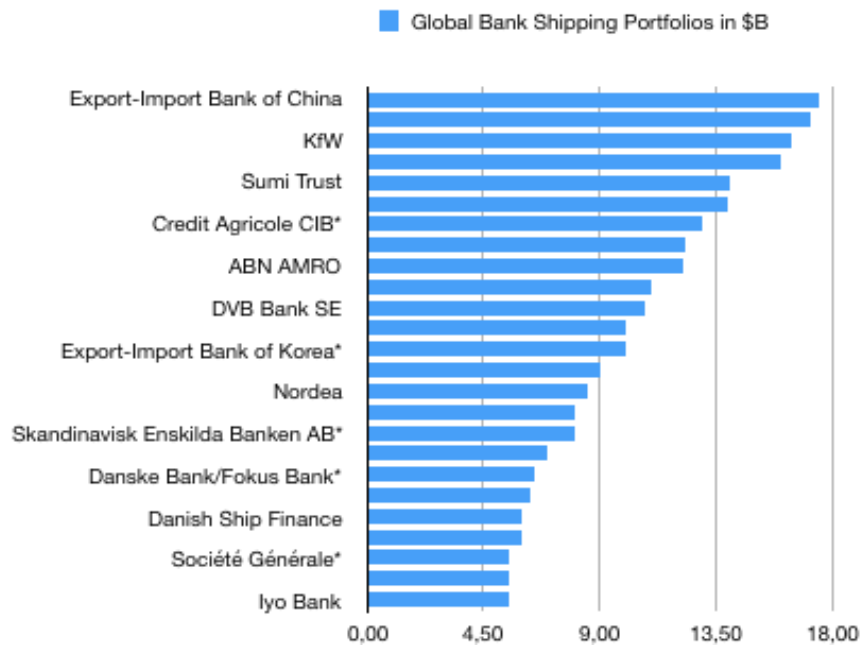


Figure 6: Top 25 shipping banks worldwide

(*market estimates) (Source: Petrofin Research, 2019)

4.6 Green Financing available to the shipping industry in the countries

With both the Netherlands and Norway having strong financial portfolios, and establishing larger interests in environmental issues, green financing has become more popular. While some banks are focusing on green finance and offers this through their banks, it is unsure how many banks are following through on the subject. However, ING and DNB are two known European shipping banks which are leading the way to green debt financing. The Dutch bank ING has together with the EIB made a 300-million-euro agreement to facilitate ‘green’ projects, which aim to improve the environmental performance of transport vessels by diminishing emissions and further increase fuel efficiency within Europe (ING, 2020b). One of their successful ventures is with the Dutch shipping company Spliethoff. The two banks have together provided the shipping company with a 110-million-euro investment as to allow the company to make its fleet less polluting by installing exhaust gas cleaning systems and ballast water management systems (ING, 2020b).

Both the Dutch banks ABN AMRO and ING, and the Norwegian banks DNB and Nordea have all become drivers of green financing for the shipping industry after the adoption of the Poseidon Principles. The Poseidon Principles work as a standard that ties shipping lending decisions to environmental criteria as mentioned earlier (Poseidon Principles, 2019). In

addition to these four banks, there is another Dutch bank which has adopted the Poseidon Principles, namely the Amsterdam Trade Bank (ATB). Although this bank was not in the ranking of the top 25 ship lending banks, they still provide financing for the entire spectrum of international trade and commodity logistics chain including shipping and is therefore important to mention (Poseidon Principles, 2019). With 14 other European banks, they will disclose climate alignment of shipping portfolios with the IMO's 50 percent emission reduction by 2050 strategy (Poseidon Principles, 2019). The bank loan portfolio to the global shipping industry will amount to approximately 100 billion dollars with the integration of climate consideration in the lending decisions (Poseidon Principles, 2019). Thus, the conclusion drawn from this information is that this is currently the most popular method of promoting green financing for banks, namely setting an amount aside specifically for green debt financing in collaborations with others in the shipping industry. This is mainly done as it eases shipping companies into the idea of green lending and will ultimately make it more compelling to invest in green technology as shipowners then can acquire funding under these criteria and there is a larger scale of promotion which increases the popularity of the 'new' funding.

4.7 Important Information Gathered from the Case Study

There are a few important takeaways from the completed case study. First and foremost, the importance of green debt financing comes through the increasing environmental pressures from the two different governments. Both countries share in 'new' and strict environmental regulations, both indirectly and directly related to the nations shipping industries. The reason why green debt financing is considered important in order to meet the environmental regulations is that both countries share environmental goals that is about sustainable funding, which highlights the integrated relationship between environmental protection and the economy. This is goal number 5 for the Netherlands and number 2 for Norway, namely the Dutch one concentrating on '*funding for innovation amid at hydrogen and other sustainable fuels*' and the Norwegian one concentrating on '*participating actively in the international cooperation OECD-DAC, the World Bank and the UN strategic environmental assessments*' (see table 4). Further, both countries share in their financial position, which is what is allowing the two countries to be pillars of growth when it comes to green financing. The banks that are contributing in the growth of green debt funding have large shipping portfolios, further supporting the fact that the countries are able to be drivers of green debt financing within the shipping industry. It is however important to emphasize that it is due to the countries financial

situations which allow for them to contribute to green financing to the shipping industry. Therefore, the conclusion is drawn that it would be difficult to sustain the green debt financing concept unless there is 'extra' funding available within the country.

Some of the most important differences to note between the countries are the focus on a global versus national approach. Although both are approaching the green transition with a global approach, it can be seen that the Netherlands has a more 'global' approach. As Norway focuses more on investing in industries which are essential to the Norwegian economy and geographical area, the Netherlands focuses on international investments. This can further be supported by the fact that Norway is focusing on national environmental regulations for the shipping industry. Getting the cruise ships which are in the Norwegian fjords to be zero emission without first pushing towards the global cruise fleet to be green is seen to be difficult. It is especially challenging to try to meet such goals as emissions are not hindered by countries borders. However, it is not seen as a negative factor to implement more strict environmental regulations within a country, but a global approach is considered to be preferable.

Chapter 5. Analysis and Result

5.1 Survey Contributors

As mentioned earlier in the methodology chapter, there was a total of 22 participants out of the 58 people asked (*the outcomes of the different surveys are attached in Appendix 5.*). That is a 37,9 % participant rate, with shipping companies being the largest participant group (*see figure 7*). The surveys were sent out to banks, shipping companies and organisations that are considered to be the main drivers when it comes to the concept of green debt financing. Organisations are important to include as they often offer a third-party view on the need and implementation on such a concept. However, the participant number is considered in the low levels when it comes to how many different banks, shipping companies and organisations that exists within the industry itself. It is therefore important to point out that the following results may give a too optimistic or pessimistic outcome, as attitudes and information may differ from the various companies which work within the same industry. Nevertheless, many of the participants share the same views on many of the questions and topics, suggesting that the information gathered can give a concrete analysis on the role of green debt financing, and further accurately answer the authors research questions. One last important thing to note is that the participants were not forced to answer all the questions, thus some questions have a smaller participant rate.

Participant Distribution

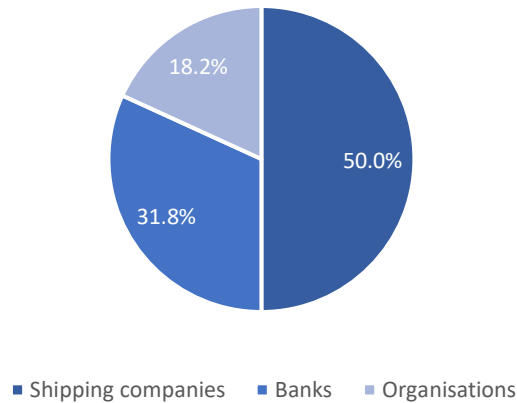


Figure 7: Participant Distribution across the groups

(Source: Author's creation)

5.2 Establishing a background

There were various questions given in each survey that laid the background of this research and highlight the importance of the topic. Two of the main questions was the measurements of how difficult each cluster found the green transition to be, and to what degree were environmental issues affecting the participants businesses. The first main question revealed that each party found the green transition to be at a level between 5 and 8 (*levels from 1 to 10*). This suggest that the parties believe that it is possible to conduct a green transition, but that they are currently missing certain aspects in order to complete such a transition. These aspects are further discussed under the following sub chapters. The second question on '*to what degree are environmental issues affecting your business*', the overwhelming answer from the shipping companies were that it was affecting them on a medium level, meaning that it is affecting their business to some degree but is not detrimental to the current survival of the business (*see appendix 5*).

Lastly, shipping companies were asked where they acquire funding from. Although most of the shipping companies had various financial sources, banks stood as the most popular source of funding (*see figure below*). This underlines the importance for banks to create a unified concept for green debt financing in order to make the loaning process easier for shipping companies.

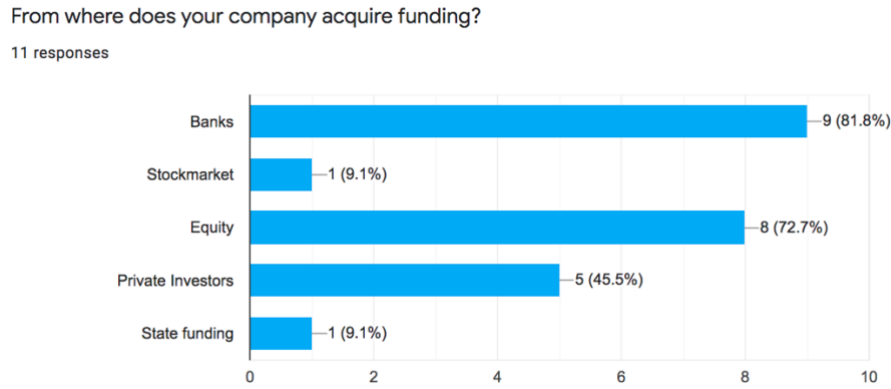


Figure 8: Main funding sources for shipping companies

(source: Author's creation)

5.3 The barriers to implementing Green Debt Financing within the Shipping Industry

To identify the barriers currently present when it comes to the practice of green debt financing, survey participants were directly asked about what they considered the largest barriers of the implementation to be. The main question asked to identify the barriers was ‘*What do you consider the largest barrier to be for banks when it comes to the implementation of green debt financing?/In your opinion, what is the largest barrier the shipping industry is facing when it comes to green investment?*’, asked in two different ways depending on the group asked. The researcher listed option in this question, which were the same across all three surveys, allowing for a clear comparison also leaving room in case someone considered another factor as a larger barrier. These barriers and the size of their role is shown in the figure below.

Barriers	Shipping companies	Banks	Organisations
Lack of interest	0	0	0
Not enough funding available	3	4	3
Lack of solutions within the shipping industry	3	3	0
The current solutions are too expensive	5	2	1
The current competition does not allow green debt financing	4	2	0
Lack of awareness around the benefits of green debt financing	6	4	2
Cost of meeting green debt financing criteria are too expensive	2	2	0
Other:	0	0	1*

Table 5: The main barriers the industry clusters are meeting.

(source: Author's creation) *One response: project size and matching projects

From the answer to this question, gathered from the various groups, there is one factor that stands out as a major barrier, namely the lack of awareness around the benefits of green debt financing. This is true for all the industry clusters that were interviewed and is thus ranked as the main collective barrier. However, it is clear to see that the various barriers also rank differently depending on which group who answered, suggesting that the different industry clusters meet different barriers to the implementation. For shipping companies, the second largest barrier, is considered to be that the current solutions are too expensive. Suggesting that the green debt financing available will not cover the wanted environmental technologies shipping companies desire and/or need. The following barrier is the '*current competition does not allow green debt financing*', which to some degree goes hand in hand with the previous barrier. This shares a link with the green technologies being too expensive for a company, as these companies will struggle to compete with other companies who are able to pay more for such technologies. This may be considered to be the case for smaller companies, who often have a smaller fleet and thus also a smaller income. Larger companies, with a larger platform, are able to use the environmental technologies as an appealing feature which plays a major role in the retention and attraction of customers, thus creating an enhanced value creation.

For banks the largest barrier, other than the one previously identified, is considered to be not enough funding available (*see the table above*). There might be various reasons as to why this is the largest barrier for banks. One being that there is a lack of cooperation between different financing institutes, or that due to the current economic situation, mainly owed to COVID-19, there is less money available across most of the banks. The lack of environmental solutions within the shipping industry is also considered a large barrier, as shipping companies and banks have both previously invested in green technologies that have proven to be less effective than first indicated. An example of this is the open-loop scrubber technology that was first introduced in order to make vessels comply with the 2020 Sulphur Cap. This technology contaminated the wash water from the scrubber system with heavy metals, aromatic hydrocarbons and soot particles which was supposed to be discharge into the ocean. Therefore, it is believed that shipping companies and banks are more sceptical to 'new' solutions, and thus as long as there is no guarantee of a long-term effect than the parties are likely to be more sceptical to large investments. The last group asked where the organisations. From this cluster it is seen that in addition to the first barrier mentioned, the main barrier is considered to be not enough funding available, which is shared by the other two groups. Companies are generally

more apprehensive to adopt new concepts, and that is why it is believed that organisations would identify this as a large barrier.

Moreover, there were several other barriers which were identified through the indirect questions of the surveys. First being the focus on short-termism within banks. The majority of banks and shipping companies stated that short-termism does hinder green financing. As mentioned earlier in the literature review, banks are presently more focused on short-term results rather than long-term effects. This of course needs to change in order to implement green debt financing successfully, as the environmental protection needs to be of a long-term nature.

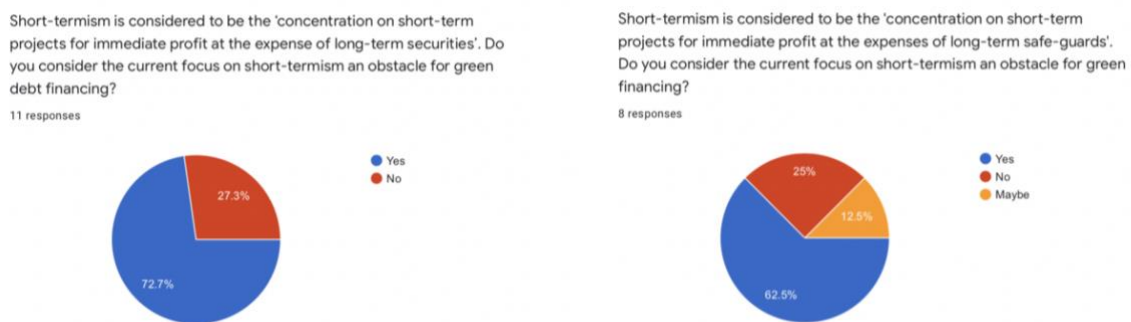


Figure 9: Short-termism as a major barrier to green debt financing

(source: Author's creation)

In addition to this 'other' barrier, a few more barriers were identified through other questions, such as the question '*what do you feel your company can do better to promote green financing?*'. From this question, one main issue is that there needs to be more transparency when it comes to the establishment of the concept. This is not only raised in this question, but also seen in other questions (*see appendix 5*). Transparency does not only relate to the name of a debt issuer, but more importantly the information with respect to green standards and regulations in order for the parties involved, all the way to the consumer, to understand the effect of the investments. The lack of transparency is also present in the form of commonly accepted transparent frameworks when it comes to financiers being able to label funding green, no matter what scale of environmental protection is present. Thus, banks have been able to define their investments according to their discretion. This is why it is important to establish transparent consensual criteria to make it easier to understand to what degree the funding is considered green. Although there are consensual criteria being established through various

companies and organisations, such as the Poseidon Principles, there is currently a lack of it both within the shipping industry, but more importantly across the financial markets. The following is a summarised table which categorises the barriers to lending, and further mention a few other barriers identified through the open-ended questions of the surveys. This table gives also gives an indication on the most important barriers for further research.

<i>General Debt Investment Environment</i>	<ul style="list-style-type: none"> • Economic barriers: low risk adjustment returns for green investments, mainly owed to absent environmental policy • Financial barriers: large sum of upfront investment needs, green technologies have high costs compared to returns
<i>Demand-side</i>	<ul style="list-style-type: none"> • Lack of awareness: missing knowledge on the opportunities of green debt financing • Lack of interest: companies are comfortable in the position they are in, will not change unless concept is successful • Competition: the current market competition does not allow for more 'expensive' fuels
<i>Supply-side</i>	<ul style="list-style-type: none"> • Lack of funding available: not enough funding that will cover long-term green investment • High up-front costs: green technologies/fuels are currently more expensive • High up-front risks: green technologies have more risks attached as many does not have a guarantee of a vessel's life cycle • Lack of transparency: currently no global standard through the shipping industry

Table 6: Barriers to green debt financing summarised and categorised

(Source: Shishlov et al, 2014; Author's creation)

5.4 The party's involvement in achieving a green industry

It is important to identify the different levels of involvement and the role of the different industry professionals. In addition, it is imperative to understand the current level of collaboration between these professionals, as well as identify how important collaboration is in order to make the concept of green debt financing optimal for the industry.

5.4.1 The importance of collaboration between the parties

Establishing the importance of each party that contribute to green financing is not enough when it comes to understanding how effective the concept can be. It is equally important to establish the current level of collaboration between the parties. The collaboration that is hoped to be established here is a full collaboration where there is a formal agreement on green financing in place as to achieve the shared vision of a green economy within the shipping industry. There is an increase interest in collaboration when it comes to creating a green debt financing model that would work throughout the industry. This is seen through the establishment of the Poseidon Principles and the Sustainable Shipping Initiative, along with other collaborative frameworks presented earlier in this thesis. In addition, through the survey it has become clear that collaboration plays a vital part. The figures below represent the level of importance on how large of a role collaboration has to say from the various participant clusters. Further, added in appendix 5 there is an opened ended question asking, ‘*how do you believe shipping companies and financial creditors can come together in order to establish a greener economy*’, which allows the participants to better explain the needed level of collaboration.

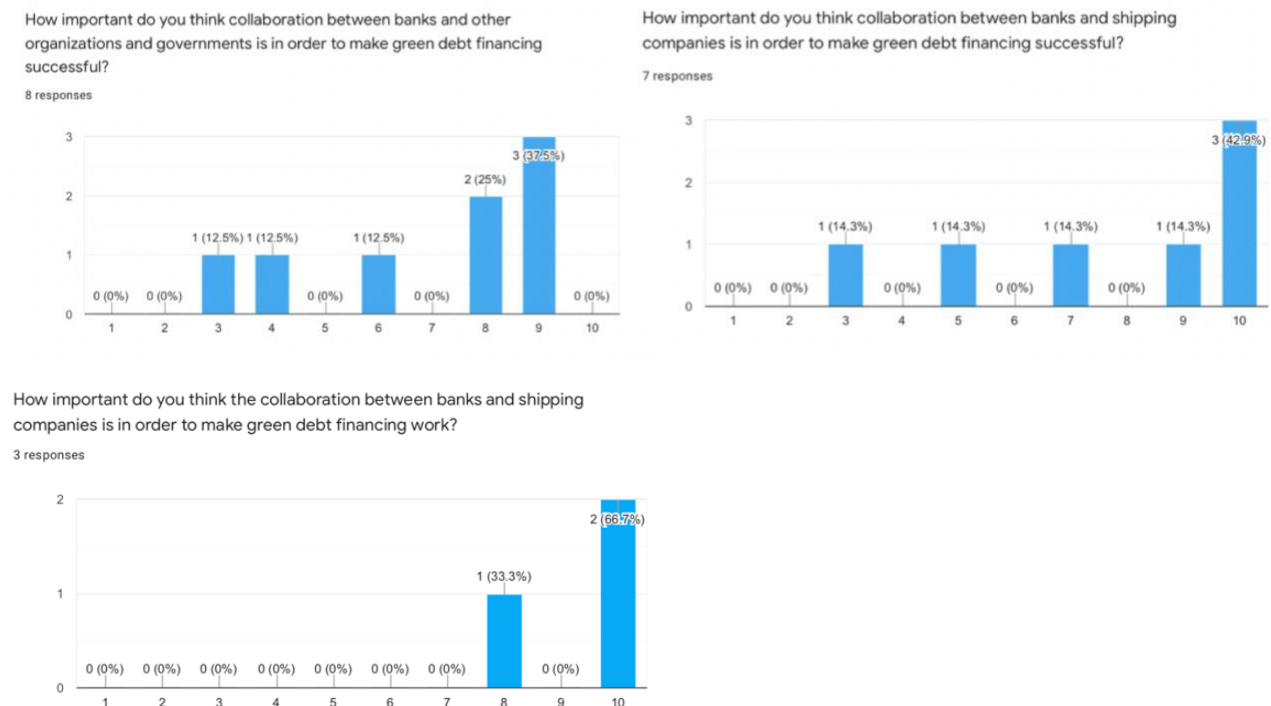


Figure 10: The importance of collaboration between the various parties

(source: Author's creation)

As seen from the figures, it is clear that the collaboration between banks and shipping companies are seen to play a detrimental role in making the financing concept work. This is further supported by the importance of the various parties previously explained. The collaboration level between banks and other organisations is also seen to make out an essential role when it comes to the success of the financing method, however, not in the same grade as banks and shipping companies. Further, from the open-ended question it is clear to see that the collaboration needed is in form of a global green debt financing standard and a transparency through the establishment of the concept. Lastly, it can also be identified that there is a need for collaboration in terms of sharing knowledge on the topic throughout the industry.

5.4.2 Shipping Companies

Shipping companies play a vital role in the successful implementation of green debt financing. It is their willingness to invest in green projects which will ultimately make the concept successful. Looking at the survey from the shipping companies; it can be identified that most of the companies are actually willing to pay more for green solutions which to some degree shows the possibility of green debt financing within the industry (*see figure below*). Further, shipping companies also share an important role when it comes to the promotion of green debt financing. This is due to the fact that the industry is often based on trends, meaning that if enough shipping companies are willing to use green debt financing than it will be easier to successfully implement the ‘new’ type of financing.

Are you willing to pay more for green initiatives/solutions?
11 responses

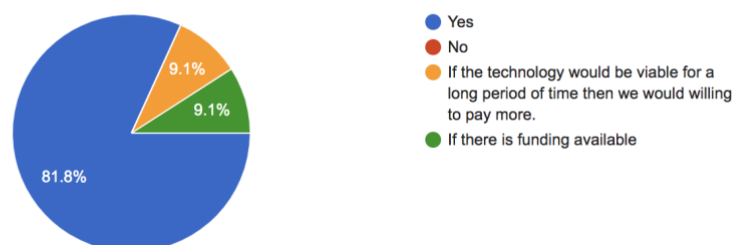


Figure 11: Shows the willingness from shipping companies to invest in green solutions

(source: Author's creation)

5.4.3 Stakeholders

There are various stakeholders which can be identified as important drivers in the green transition in the shipping industry. One of the most important stakeholder groups which can be recognised is the customers. This group of stakeholders is increasingly interested in doing business with companies who are worried about mitigating negative environmental impacts. The relationship between shipping companies and clients will, however, change from the current one as the focus needs to be on green solutions which have been identified as often being more expensive earlier in this study. Thus, companies will have to increase the prices for their customers. This means that many shipping companies will have to change their business models in order to make it clear where that extra money is going, so clients know that the price jump is coming from the green solution and not anything else.

Secondly, employees can be categorised as a stakeholder group, due to the fact that people in general are increasingly mindful of their actions, as well as others' actions, when it comes to sustainable initiatives. Therefore, companies should implement environmental measures in order to be more attractive to employees. Further, adding value to a company. Certain banks and governments are also considered to be vital stakeholders, as they often take a key part in the decision making of an industry. Such decisions are considered to be the promotion of environmental concept, but most importantly the economic benefits they provide companies with. Another important group is the general public. They play an important part in the perception of how willing companies are to help minimize emissions and other harmful environmental impacts. In a world where people are able to publicly share their opinion, and reaching other people globally within seconds, this group plays an equally important part as many of the other stakeholder groups, as they can opt to boycott certain companies and influence the opinions of others.

5.4.4 Banks

It is obvious that banks play a vital role in the completion of the green debt financing concept. Currently banks are working on establishing criteria which will aid in creating a successful concept. As previously presented in this thesis, banks are coming up with various criteria and methods, but it is believed that the optimal solution to green debt financing would be that the banks within the industry would come together and create one standard of green debt financing in order to make it more accessible for shipping companies. Banks now have to focus on giving out loans with a purpose that is not limited to include the direct impact of green investments,

but also into a societal context which is achieved through a financial investment. Banks, as well as other financial institutions, need to communicate how funds are allocated and clarify their purpose. This has to be done in order to accumulate the required investments across the industry, or in a larger scale across the financial markets.

5.4.5 Supporting Organizations

Although many organizations, both within and outside the shipping industry, play a major role in the promotion of green financing, they do not play that role at the same level of importance compared to banks and companies. This is due to the fact that banks and companies are actual execution parties of the concept, while most organisations work as support and/or promotion parties. Nonetheless, many of the organisations are vital to drive the concept as they are able to partner many of the companies and banks. Further, supporting organisations are often the once to implement environmental regulations within an industry. Therefore, they operate as a major driver of green initiatives, as shipping companies and banks then have to meet certain environmental targets in a specific time period which they would not have to meet if it was not for such organisations. The different regulatory organisations can employ a holistic method which will tackle the whole financial value chain, meaning from supply to demand, supporting and driving the implementation of green debt financing.

5.5 What is missing when it comes to green debt financing

Through various questions the main factor which was missing from the concept was the lack of shared green debt financing standards. There were various ways of stating this, namely lack of transparency between the industry's members, guidelines on what green technical solutions would be viable for the industry in the long-term, joint ventures between banks and lack of shared industry standards on green debt financing. There are other factors through this thesis which support this. These factors are shown through the various approaches to green debt financing and that it is difficult to govern the ocean due to the various zones and organisations that are involved. It is therefore important to note that green debt financing should not fall into the same notion of having to many organisations involved in the development and implementation of the concept.

5.6 Green Debt Financing facilitates Businesses to acquire corporate sustainability

The most important role of green debt financing is that it will ultimately help companies (including banks) achieve corporate sustainability. Corporate sustainability is a concept that

aims at creating long-term stakeholder value through the implementation of a business model which focuses on ethical, social, environmental, cultural and economic scopes. If we look at the lifecycle of a sustainable product, it will start with the beginning of life, the middle of life and end of life. It is through these three stages a business is able to create corporate sustainability. This is especially true in the shipping industry where the life cycle of a vessel is relatively short, ranging from approximately 20 to 30 years. Green debt financing can aid in making sure there is sustainability throughout the cycle, as it will be clear where the financing came from and that it is green. However, the issue will come at the start of the life cycle when it comes to the initial source of the green financing, and the end of the life cycle when it comes to the scrapping of the vessel. It is currently impossible to understand where financial institutes are getting their money to invest, due to the many industries and countries which they operate within. This needs to change to make green financing successful, as the green funding should not come from other environmental hazardous sources and rather have to come from other green investment which have generated capital. When it comes to the end of the life cycle, many scrapyards are not environmentally friendly and dangerous. It will therefore be of interest to banks that when the loan is first given out, one criterion should be that the company will have to scrap this vessel at an approved scrapyard. The main regulation in this area which can aid in the transparency through the business cycle are the Hong Kong Convention⁸, the EU Ship Recycling Regulation⁹, the Responsible Ship Recycling Standards (RSRS)¹⁰ and the Ship Recycling Transparency Initiative (SRTI)¹¹. The amount of regulations which play a role in the transparency throughout a vessel's life explains the importance of the concept of green debt financing. This is not seen as a large issue on the European continent, as they are stricter regulated on this area, however, there should be an increase in the signatories for the SRTI to boost the transparency of a shipping company's business. Green debt financing will further aid in the middle section of the life cycle by making sure that the fuel sources and technology used will be zero emission or at least contribute to the mitigation of emissions from the industry.

⁸ The Hong Kong Convention for Safe and Environmentally Sound Recycling of Ships; aims at ensuring that vessels are recycled do not create any unnecessary risk to human health and safety to the environment (IMO, 2020).

⁹ The EU Recycling Regulation; is set in place by the European Parliament and the Council of the European Union in order to reduce negative impacts linked to ship recycling. Under this regulation, all EU flagged commercial vessels above 500 GT have to be recycled in an environmentally sound and safe facility which is on the European List of approved ship recycling facilities.

¹⁰ The RSRS are considered voluntary principles for financial institutions within the shipping industry, which aims at promoting responsible ship recycling while minimizing dangers that come from hazardous materials from vessels.

¹¹ The SRTI are also considered a voluntary platform for shipowners to publicly disclose their approach to ship recycling.

5.7 The impacts Green Debt Financing will have on the Shipping Industry

There are several opinions gathered from the surveys which explains how the participants believe green debt financing will impact the future of shipping. To better understand this, participants were asked an open ended questions on '*how they believed the concept of green debt financing would impact the shipping industry*'. The answers were mainly positive, although one or two of them acknowledged some issues regarding the implementation of green debt financing. The positive effects were that the concept will ultimately aid in the green transition of the industry by facilitating green technological innovations, bridge the gap to commercially viable decarbonised shipping, make it easier to comply with environmental regulations and there will be an increase in environmental regulations. It will overall become a key tool in a sector which plays a major role in the global economy and reduction of emissions globally. The main feature is that it can facilitate innovations which will make it easier to foster and implement the concept. Further, it is important to note that the increase in environmental regulations is not seen as a negative feature, but rather a positive effect of how well green debt financing is working. From these features it is recognised that there is an integration between the current green debt financing concept and the introduction of new sustainable technologies within the industry, further aiding in the compliance of set environmental regulations.

5.7.1 Comply with upcoming environmental regulations

In combination with the general impacts of how the green financing concept would affect the shipping industry, the participant clusters were also asked if they believed green debt financing is essential for the shipping industry to meet the criteria of the 2050 IMO regulation on reducing GHG emissions. Here there was a 100 percent agreement across the groups. They all stated that they believed green debt financing would be essential in meeting the upcoming regulation (*see appendix 5*). However, it is difficult to know if green debt financing can reduce the GHG emission levels by 50 percent from the 2008 levels, but due to the fact that this is the target of the regulation, green debt financing can only be seen as a positive tool. Though, it is important to understand that green debt financing alone cannot stand for the green transition within the industry but is rather an important aid in driving environmental solutions.

5.7.2 Overall Benefits to Green Debt Financing

The overall benefits which can be obtained from the implementation of green debt financing across the shipping industry is presented in the following table. These benefits are important to point out as to make it easier to close the gap of lack of awareness around the benefits of green debt financing, which was identified as a large barrier in the previous section.

The Main Benefits to Green Debt Financing
<ul style="list-style-type: none">• Aiding in the shipping industry professionals communicate their sustainable strategy• Creating transparency across the industry, which improves and expands the relationships between banks, shipping companies and organisations (<i>especially regulatory organisations</i>)• Easier to implement long-term environmental strategies, resulting in it will be easier to comply with upcoming regulations• Supporting the implementation of a green transition• Driving new sustainable solutions for the shipping industry

Table 7: The main benefits of green debt financing

(source: Author's creation)

Chapter 6. Conclusion and Recommendations

In conclusion, the concept of green debt financing will play a vital role in the future of shipping by creating a more transparent debt banking system. By answering the sub research questions first, it will lay the ground for the results of the main research question. All the research questions are answered through various aspect. One being through the already existing literature, then through the case study which presented more of a real-life perspective, lastly through the analysis of the industry professionals as it gave vital insight on the topic which would not have been possible otherwise.

There are many barriers which are identified that the shipping industry is facing in order to create a greener economy. From the analysis of the surveys it can be seen that lack of awareness around the concept of green debt financing, along with the lack of transparency and shared standards, and focus on short-termism are considered to be the main barriers. This is further supported by the features the shipping industry displaces within the literature review. Specifically, when it comes to the number of institutes which governs the ocean and the already existing institutes which are focusing on green financing and environmental mitigation within

the industry itself. The large number of institutes is going to make it more difficult for them to cooperate on a global level and further introduce standards which will work across the industry.

However, looking at the case study on the comparison of Norway and the Netherlands it is possible to create a global group that collaborates on green financing, such as the Poseidon Principles. Although this does not belong specifically to either of the two countries and is rather a global instrument, it is seen that the two are able to collaborate on the concept of green debt financing thus overcoming many of the barriers such as the lack of transparency. Non the less it is important to mention that this only works if all banks are willing to join the collaboration. Further, it should be noted that the best option would be to have a collaboration which includes both banks, shipping companies and regulatory organisations as to make the implementation of green debt financing fit all the industry participants. All the shipping companies and financial creditors are thus able to come together and create a global transparent standard which will make the concept more likely to succeed and will increase the speed of the implementation. The collaboration between the parties will further create a better method of sharing knowledge. The EU Taxonomy is a framework which can aid in the concealment of the barriers identified previously, as it is set in place so investors, companies, issuers and project promoters can come together to create a green economy. Although this is not specifically aimed at just the shipping industry, it embodies features which is needed for the creation of global standards and transparency when it comes to green financing in the shipping industry.

There will be a change in sources of capital available to the shipping industry depending on the implementation and use of green debt financing. No matter how the final outcome of the product, in relation to green debt financing, the shipping companies who are willing to invest in environmentally friendly technologies will have an easier time finding financing. It is difficult to see far into the future of green debt financing, but as long as the concept is creating an increased interest in green initiatives most shipping companies will benefit from the ‘new’ financing method. Nonetheless, it is important to mention that if all sources of financing are green then the current fleet will struggle as they will experience a lack of financing available. It is therefore said that this is specifically difficult for the shipping industry where vessels only have a life cycle of around 20 to 30 years, and therefore many companies will not invest in new technologies for older vessels as this is currently a big financial burden which often outweighs the environmental impacts. The business model of a shipping company can, however, be positively affected in many ways that will outweigh the financial burden of retrofitting a vessel

or buying a more expensive 'green' vessel. As discussed earlier, the focus on environmental mitigation will attract a number of stakeholders, which will generate revenue for shipping companies and banks, but it is then important for shipping companies to create a business model which will make it transparent as to where the extra money for the green solutions are going so that their clients can actually see that they are contributing to environmental protection.

The two main factors for the green debt financing concept to work is the purpose of the loan and the transparency throughout the process. This is why it is important to create shared standards across the financial markets, and more specifically within the shipping industry, as there are currently numerous frameworks for green financing which makes it difficult to establish the level of transparency needed. The optimal solution would be to have transparency throughout the whole value chain. It is clear to see that public investments, regulations such as the IMO GHG Cap and UN's SDGs, and policies provide a framework for green financing and can therefore attract green capital. This is why the increasing regulatory environment within the shipping industry is currently seen as a positive effect on the concept. This is seen through the case study of Norway and the Netherlands where the increasing regulations within the countries have had consequences, such as the environmental lawsuits. Underlying the importance of green financing as a tool in order to meet environmental regulations. It is further identified through this study that green debt financing can aid in the compliance of the 2050 IMO regulation on reducing GHG emissions by 50 percent in various aspects, which highlights the integrated relationship between green financing and the increasing regulatory environment. Green financing will drive environmentally friendly technologies, making it easier for the shipping industry to adapt with a cheaper price mark. Though, currently it is considered relatively expensive to adapt certain green solutions and therefore many shipping companies are opting out by waiting for a cheaper solution. Green financing can further aid in the compliance of the upcoming regulation by again attracting more stakeholders to the company, which will generate business opportunities within the company. In many of the same manners, green financing will impact the future of shipping in a positive way, especially by driving green solutions and bringing the industry together through a higher level of collaboration. However, it might be difficult for companies with smaller amount of capital to survive the transition. Due to the fact that the current green solutions are more expensive and current green financing is difficult to obtain as the concept is not a widespread within the industry yet. It is therefore even more important to establish a green financing concept which will be inclusive and transparent.

6.1 Recommendations for future research

This study only tackles a certain green financing method, even though this study has established that there are various sources of green financing currently available. Thus, it will be important for future studies on the topic to include such sources of financing in order to create a comprehensive study on what the various sources are missing and how the various financing institutions can come together to create a global standard for green investment. It might also be of interest for future researcher to take another research approach, as the one chosen in this study is only one of many approaches. In addition, it would be interesting to do a survey for clients of shipping companies to see if they are willing to pay more for green solutions. Although they do not pay a large sum for the initial green investment, like the shipping companies, the extra cost of the green solutions is expected to fall on the clients and therefor they play a major part in the implementation of the green debt financing concept which should be taken into further consideration.

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Appendix List.

Appendix 1: Keyword list

<i>Keyword List</i>					
Place names	Norway; Netherlands; Europe; Artic Barents Sea;				
Generic	Climate change; Environment; Green Finance; Investment; Green Shipping; ESG; Emissions; Shipping Regulations				
Biophysical	CO ₂ ; LNG; Methanol; Biodiesel; Biogas; Hydrogen				
Subjects	Economical	Technological	Environmental	Social	Political
Specific	The current availability of Green Debt Financing; The economic context of the Netherlands/Norway; Green Investment Banks; Sustainable finance	Alternative fuels available to the shipping industry; The transition from steam to diesel; Energy transition	The IMO 2050 regulation; SDG goals; The impact of green financing; Sustainable value creation; EU Taxonomy	The effects of global warming	Norwegian Green politics; Dutch green politics; Urgenda versus the Dutch government; Nature and Youth + Greenpeace versus the Norwegian government; Green Financing from governments

(sources: Author's own, 2020)

Appendix 2: Survey designs

Green Investment Questionnaire for Banks	
This questionnaire is made to get a broader understanding of the barriers green financing is facing when it comes to its performance within the shipping industry. The barriers are important to identify in order to get a comprehensive grasp on how green debt financing can assist in the green transition within the shipping industry.	
Introductory Part	
Name:	
Job position:	
Name of company:	
Size of shipping portfolio:	
Policy	
Does your bank have a green policy for your ship financing activities?	<input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Other: *Add comment:
*If yes, has your company rejected investment opportunities based on that green policy?	<input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Other: *Add comment:
How does your company encourage green debt financing?	
How important do you consider the encouragement of green debt financing to be for your bank?	Not important – Very important O 1 O 2 O 3 O 4 O 5 O 6 O 7 O 8 O 9 O 10 <i>Mark only one oval</i>
Please describe the types of green projects within the shipping industry which your organization was involved:	*Add comment:
Impact	
What do you consider the largest barrier to be for banks when it comes to the implementation of green debt financing?	<input type="radio"/> Lack of interest <input type="radio"/> Not enough funding available <input type="radio"/> Lack of environmental solutions within the shipping industry <input type="radio"/> The current solutions are too expensive <input type="radio"/> The current competition does not allow green debt financing <input type="radio"/> Lack of awareness around the benefits of green debt financing <input type="radio"/> Cost of meeting green debt financing criteria are too expensive <input type="radio"/> Other:
How important do you think collaboration between banks and other organizations and	Not important – Very important

governments is in order to make green debt financing successful?	<input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9 <input type="radio"/> 10 <i>Mark only one oval</i> *Add comment:
How important do you think collaboration between banks and shipping companies is in order to make green debt financing successful?	Not important – Very important <input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9 <input type="radio"/> 10 <i>Mark only one oval</i> *Add comment:
How do you believe the shipping industry and financial creditors can come together in order to establish a greener economy?	
Short-termism is considered to be the ‘concentration on short-term projects for immediate profit at the expenses of long-term safe-guards’. Do you consider the current focus on short termism and obstacle for green financing?	<input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Maybe <input type="radio"/> Other:
*If yes, in what degree do you consider short-termism to be an obstacle for green debt financing in the shipping industry?	Not important – Very important <input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <i>Mark only one oval</i>
How does your company react to the increasing focus on green financing?	
Has it been difficult for your company to find green initiatives to invest in?	<input type="radio"/> Yes <input type="radio"/> No
*If yes, what are the main reasons why?	
What do you feel your company can do better to promote green financing?	
Which of these statements do you associate with green debt financing?	<input type="radio"/> Green debt financing can help solve the climate challenge by meeting the growing demand for low carbon projects <input type="radio"/> Green debt financing is offered to obtain positive reputational benefits <input type="radio"/> Green debt financing can make it difficult to retain customers <input type="radio"/> Green debt financing is currently not a unified concept which raises confusion among customers <input type="radio"/> Other:
To what degree do you feel green financing addresses climate change?	Not at all – In a very large scale <input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9 <input type="radio"/> 10 <i>Mark only one oval</i>

Do you believe green debt financing is essential for the shipping industry in order to be able to meet the standards of the 2050 IMO regulation on reducing GHG emissions by 50%?	<input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Maybe <input type="radio"/> Other:
How do you believe green debt financing will impact the future of shipping?	
Response Summary	
Are you interested in the results of this survey? If yes, then the answer will be sent to you on email after the survey's time span.	<input type="radio"/> Yes <input type="radio"/> No
I am currently doing a similar questionnaire for shipping companies and organizations as well. If you are interested in this, please indicate below.	<input type="radio"/> Yes <input type="radio"/> No

Green Investment Questionnaire for Shipping Companies	
This questionnaire is made to get a broader understanding of the barriers green financing is facing when it comes to its performance within the shipping industry. The barriers are important to identify in order to get a comprehensive grasp on how green debt financing can assist in the green transition within the shipping industry.	
Introductory Part	
Name:	
Job position:	
Name of company:	
Size of shipping portfolio:	
Policy	
Does your company incorporate environmental and social sustainability elements in your vision and strategy?	<input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Other:
Is your institute a signatory member of the global initiatives related to sustainable development and green finance?	<input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Other:
From where does your company acquire funding?	<input type="radio"/> Banks <input type="radio"/> Stockmarket <input type="radio"/> Equity <input type="radio"/> Private Investor <input type="radio"/> State Funding <input type="radio"/> Other:
Impact	
To what degree are environmental issues affecting your institution's business risk?	<p style="text-align: center;">Very small degree – Very large scale</p> <p style="text-align: center;"> <input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9 <input type="radio"/> 10 </p> <p style="text-align: center;"><i>Mark only one oval</i></p>
In your opinion, how difficult is it currently to get debt financing for shipping companies?	<p style="text-align: center;">Not difficult – Very difficult</p> <p style="text-align: center;"> <input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 </p>

	<p><i>Mark only one oval</i></p> <p>*Add comment:</p>
In your opinion, what is the largest barrier the shipping industry is facing when it comes to green investment?	<p> <input type="radio"/> Lack of interest <input type="radio"/> Not enough funding available <input type="radio"/> Lack of environmental solutions within the shipping industry <input type="radio"/> The current solutions are too expensive <input type="radio"/> The current competition does not allow green debt financing <input type="radio"/> Lack of awareness around the benefits of green debt financing <input type="radio"/> Cost of meeting green debt financing criteria are too expensive <input type="radio"/> Other: </p> <p>*Add comment:</p>
Short-termism is considered to be the 'concentration on short-term projects for immediate profit at the expense of long-term securities'. Do you consider the current focus on short-termism an obstacle for green debt financing?	<p> <input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Other: </p>
In what degree do you see the current pressure of environmentally friendly solutions a threat to the shipping industry?	<p>Very small degree – Very large degree</p> <p> <input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9 <input type="radio"/> 10 </p> <p><i>Mark only one oval</i></p>
What do you feel is missing when it comes to shifting towards greener opportunities for shipping companies?	
In what degree do you see the current pressure of environmentally friendly solutions an opportunity for the shipping industry?	<p>Very small degree – Very large degree</p> <p> <input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9 <input type="radio"/> 10 </p> <p><i>Mark only one oval</i></p>
How big of a role do you consider green debt financing to have when it comes to reaching environmental goals set by international organisations and governments?	
In what degree do you feel green debt financing addresses climate change?	<p>Very small degree – Very large degree</p> <p> <input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9 <input type="radio"/> 10 </p> <p><i>Mark only one oval</i></p>
How has the criteria of obtaining financing for shipping companies changed over the years?	

Has it been more difficult to acquire funding over the last five years (after the increased interest in environmental protection)?	<input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Other:
*If yes, what are the main reasons for the difficulty?	
What do you feel your banks can do better to promote green financing?	
Do you feel there is enough green debt financing available for your company?	<input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Other:
	*Add comment:
Has your company changed the way you operate in order to acquire green debt financing?	<input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Other:
	*Add comment:
Are you willing to pay more for green initiatives/solutions?	<input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Other:
	*Add comment:
How do you believe shipping companies and financial creditors can come together in order to establish a greener economy?	
How can green investment facilitate shipping companies business models in order to become more sustainable?	
How do you believe green debt financing will impact the future of shipping?	
Response Summary	
Are you interested in the results of this survey? If yes, then the answer will be sent to you on email after the survey's time span.	<input type="radio"/> Yes <input type="radio"/> No
I am currently doing a similar questionnaire for shipping companies and organizations as well. If you are interested in this, please indicate below.	<input type="radio"/> Yes <input type="radio"/> No

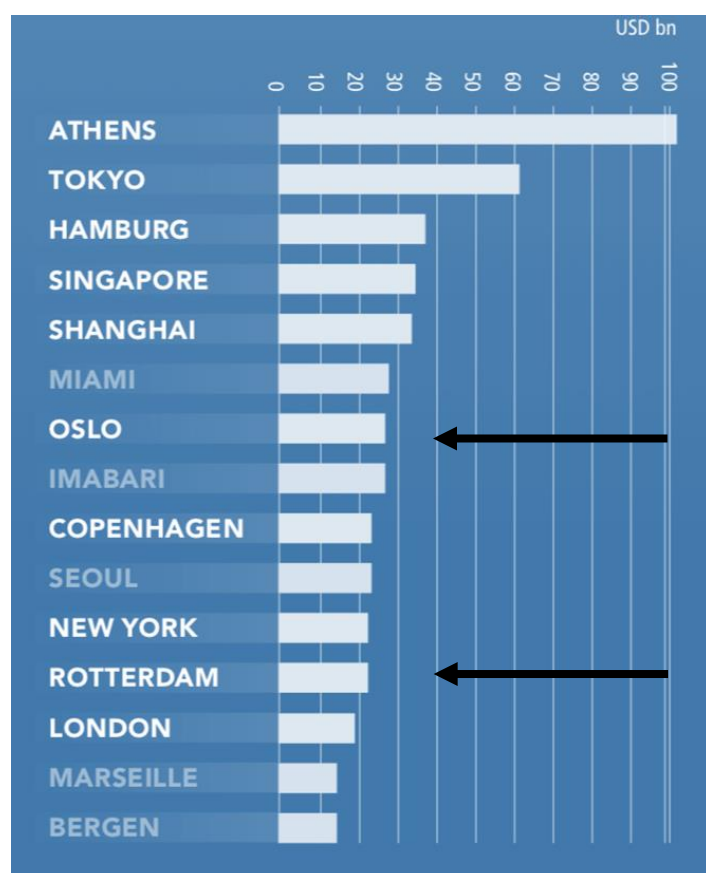
Green Investment Questionnaire for Organisations	
This questionnaire is made to get a broader understanding of the barriers green financing is facing when it comes to its performance within the shipping industry. The barriers are important to identify in order to get a comprehensive grasp on how green debt financing can assist in the green transition within the shipping industry.	
Introductory Part	
Name:	
Job position:	
Name of company:	

Size of shipping portfolio:	
Policy	
In which area of environmental protection does your organization work within?	<input type="radio"/> Financial <input type="radio"/> Regulatory <input type="radio"/> Creating technological/physical solutions to environmental issues
How does your company help promote green initiatives?	
Roughly, what is the success rate of the green projects that your institute has already contributed in?	<input type="radio"/> 1% - 10% <input type="radio"/> 11% - 20% <input type="radio"/> 21% - 30% <input type="radio"/> 31% - 40% <input type="radio"/> 41% - 50% <input type="radio"/> 51% - 60% <input type="radio"/> 61% - 70% <input type="radio"/> 71% - 80% <input type="radio"/> 81% - 90% <input type="radio"/> 91% - 100%
Does your organization promote green debt financing?	<input type="radio"/> Yes <input type="radio"/> No
*If yes, how does your company promote green debt financing?	
Impact	
How difficult do you consider the green transition to be?	<p>Not difficult – Very difficult</p> <p><input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9 <input type="radio"/> 10</p>
Do you feel banks reject investments based on their green policy?	<input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Other:
How important do you think green debt financing is when it comes to the shipping industry?	<p>Not important – Very important</p> <p><input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9 <input type="radio"/> 10</p>
Do you feel companies are willing to pay more for green initiatives?	<input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Other:
What do you consider the largest barriers to green investment to be?	<input type="radio"/> Lack of interest <input type="radio"/> Not enough funding available <input type="radio"/> Lack of environmental solutions within the shipping industry <input type="radio"/> The current solutions are too expensive <input type="radio"/> The current competition does not allow green debt financing <input type="radio"/> Lack of awareness around the benefits of green debt financing <input type="radio"/> Cost of meeting green debt financing criteria are too expensive <input type="radio"/> Other:

How important do you think collaboration between banks and shipping companies is in order to make green debt financing work?	Not important – Very important <input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9 <input type="radio"/> 10
How do you believe the shipping industry and financial creditors can come together in order to establish a greener economy?	
What do you feel banks can do better to promote green financing?	
With the next major environmental goal/regulation for the shipping industry reaching its threshold, namely the the 2050 IMO regulation on reducing GHG emissions by 50 % of the 2008 levels, do you believe green debt financing is essential?	<input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Other:
How do you believe green debt financing will impact the future of shipping?	
Response Summary	
Are you interested in the results of this survey? If yes, then the answer will be sent to you on email after the survey's time span.	<input type="radio"/> Yes <input type="radio"/> No
I am currently doing a similar questionnaire for shipping companies and organizations as well. If you are interested in this, please indicate below.	<input type="radio"/> Yes <input type="radio"/> No

Appendix 3: The 15 most valuable fleets in the world.

Value in Billion USD of the fleet controlled by companies with headquarters in the city:



(Source: Maritime Global Hub, 2019).

Appendix 4: Ranking Maritime Finance and Law

Country/City	Ranking	Objective Indicators	Subjective Indicators
London	1	2	1
New York	2	1	4
Oslo	3	3	3
Hong Kong	4	6	5
Singapore	5	9	2
Tokyo	6	4	8
Rotterdam	7	5	9
Shanghai	8	8	7
Hamburg	9	14	6
Copenhagen	10	11	11
Athens	11	12	10
Dubai	12	13	11
Busan	13	15	15
Antwerp	14	22	13
Houston	15	31	14

(source: Maritime Global Hub, 2019)

Appendix 5: Outcome of Surveys

Banks:

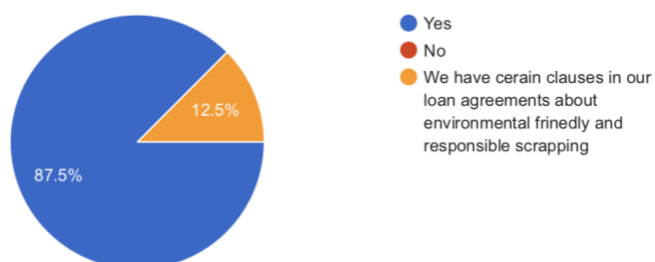
Section one: Introductory part

Including private information, thus left anonymous.

Section two: Policy

Does your bank have a green policy for your ship financing activities?

8 responses



*Add Comment:

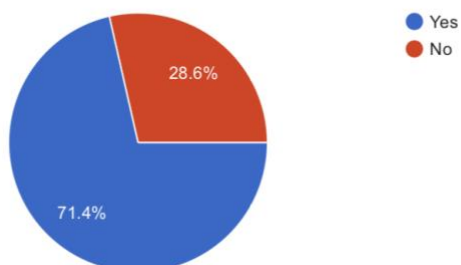
2 responses

We are a signatory member of the Poseidon Principles.

All financed vessels require to carry a 'RightShip' energy label. Targets vessels with energy label D or better; financial incentive for vessels with label E to improve. No financing of label F and G. In addition, we require a Green Passport for vessels we will finance.

*If YES, has your company rejected investment opportunities based on that green policy?

7 responses



***Add Comment:**

1 response

It is a fairly new concept but we expect to have an increase in the rejection of investments over the next few years.

How does your company encourage green debt financing?

6 responses

Through the Poseidon Principles which offer the opportunity to improve the transparency of the climate impact of the shipping industry and align leading shipping bank portfolios with our climate goals in reducing GHG emissions

Through the Poseidon Principals.

By becoming Signatories of the Poseidon Principles, we want to play an active role in reducing the global carbon footprint and contribute to a cleaner and more sustainable environment.

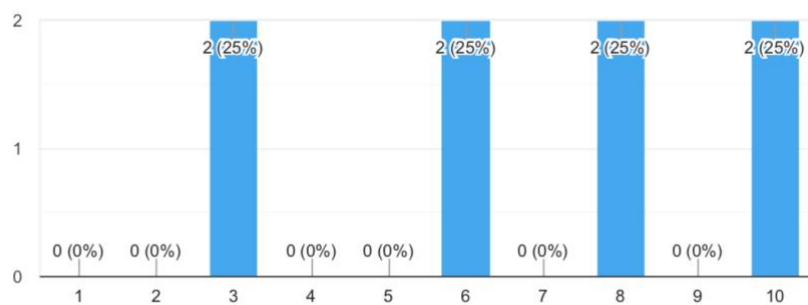
Through the Poseidon Principals and strict corporate rules where we have established an overall framework that indicates which activities qualify for green loans.

given our exit strategy, we are not persuing any new business anymore

We don't. We focus on secondhand tonnage. And although we support the idea by using the RightShip methodology, you can do only so much with existing tonnage.

How important do you consider the encouragement of green debt financing to be for your bank?

8 responses



Please describe the types of green projects in the shipping industry which your organization was involved:

6 responses

Financing vessels that have refitted their old vessels with more environmental solutions.

Refitting secondhand vessels.

Refitting vessels to meet the 2020 regulation.

Decarbonising technologies on vessels. Both new builds and refitting of older vessels.

We have signed up for the Poseidon Principles and as mentioned have a clause in our loan agreement encouraging shipowners to engage in environmental friendly scrapping of older tonnage.

Not applicable.

*Add Comment:

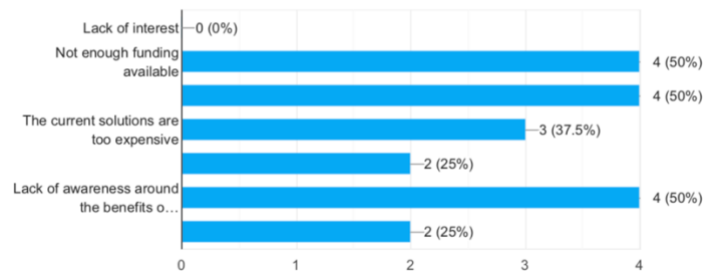
1 response

We support the idea, but make it not conditional. Contrary to a bank, we - as a direct lending platform - are not limited by a general sustainability policy that banks nowadays need to have, partly for image building in relation to the general public and political environment.

Section three: Impact

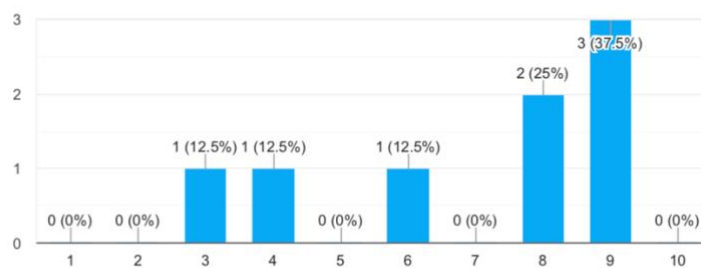
What do you consider the largest barrier to be for banks when it comes to the implementation of green debt financing?

8 responses



How important do you think collaboration between banks and other organizations and governments is in order to make green debt financing successful?

8 responses



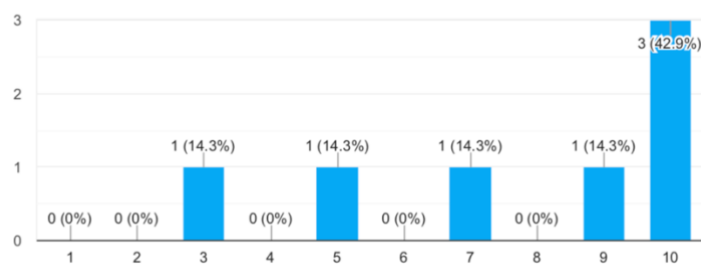
*Add Comment:

1 response

The transformation to more 'green shipping' (read: hybrid propulsion and/or hydrogen propulsion) is still in early days. Apart from the short-term infrastructure challenges in many areas in the world for bunkering 'new' fuels, the industry must still crystallize what will ultimately be the successor to diesel propulsion. Wind parks, solar projects etc. receive serious subsidies from local, national and EU bodies. If the EU for example takes 'green shipping' seriously, (serious) money should be made available like for other sustainability projects. In addition, (major) charterers may push for green shipping, but are not ready to pay higher freight rates. It is too easy to simply point to owners to invest in and to banks to finance innovative, uneconomical, not yet proven technology. Shipping is marginal business.

How important do you think collaboration between banks and shipping companies is in order to make green debt financing successful?

7 responses



*Add Comment:

1 response

Collaboration is always nice. But both ship owners and banks are entities driven by creating economic value for their stakeholders. Maybe I'm reading something between the lines that is not there, but if this question implies that banks are asked to 'support' owners because they sympathetic to the course, that would be to wrong way forward. It should make sense and be secure from a credit perspective.

How do you believe the shipping industry and financial creditors can come together in order to establish a greener economy?

7 responses

We believe that the Poseidon Principals are key to establishing a greener economy. We are excited to see the Poseidon Principles come to life and we encourage all our ambitious peers to join in this initiative

Involve all parties on an international level within the shipping industry to create transparent and coherent green financing standards.

Through signatories such as the Poseidon Principals with stricter internal sustainable strategies.

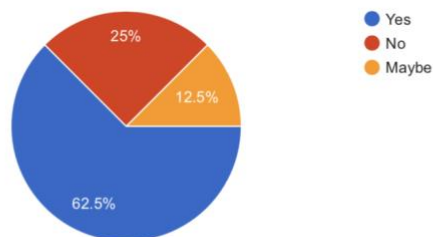
Most banks should become signatory of the Poseidon Principles as it creates transparent green criteria through the industry.

Transparent guidelines on green financing, i.e. Poseidon Principles. It would also be beneficial if companies and banks shared knowledge on the subject to make criteria fit the need of the companies.

National Shipowners Associations should form a group and discuss these items with the

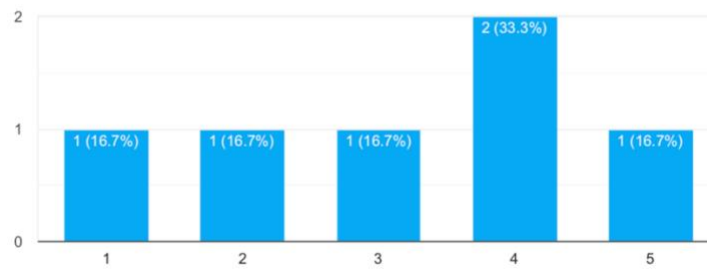
Short-termism is considered to be the 'concentration on short-term projects for immediate profit at the expenses of long-term safe-guards'. Do you consider the current focus on short-termism an obstacle for green financing?

8 responses



*If YES, in what degree do you consider short-termism to be an obstacle for green debt financing in the shipping industry?

6 responses



How does your company react to the increasing focus on green financing?

6 responses

We have employed stricter sustainable solutions and collaborated closely with other banks in order to create transparency on green financing.

We feel like we have adapted well to the increased focus and agree on the importance of it.

As the largest financial services group in the Nordic region it is very important to promote green financing by collaborating with other banks.

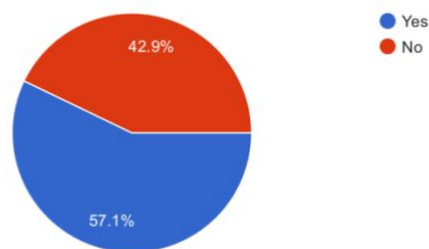
Now is the time to advance the role of banks in addressing global environmental issues. We encourage all our colleagues to join us in leading industry-wide change by becoming Signatories of the Poseidon Principles.

again, as we are withdrawing from the industry, this is not so relevant for us (anymore)

The green shipping discussion is primarily (and logically so) linked to newbuilding vessels. As said, we focus on opportunities in the secondhand market.

Has it been difficult for your company to find green initiatives to invest in?

7 responses



*If yes, what are the main reasons why?

4 responses

- cost does not match the competition level
- There is not specific pricing for certain environmental technologies making it difficult to find the right green initiatives.
- Cost of current solutions are not currently competitive.
- costs are not competitive in this global and highly competitive environment

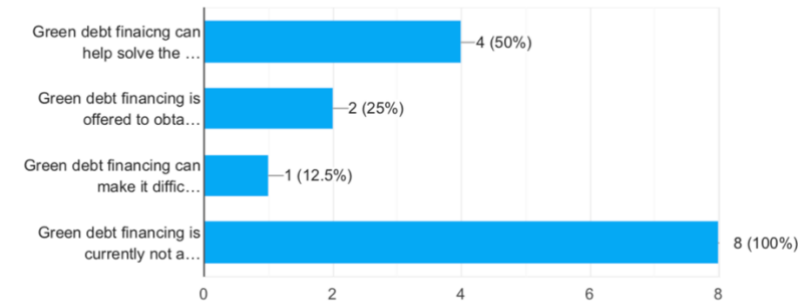
What do you feel your company can do better to promote green financing?

4 responses

- Transparency is key. We feel like we are becoming more transparent through the Poseidon Principles.
- Have open discussions on the matter with other financing sources.
- n/a
- Not our focus, to be honest.

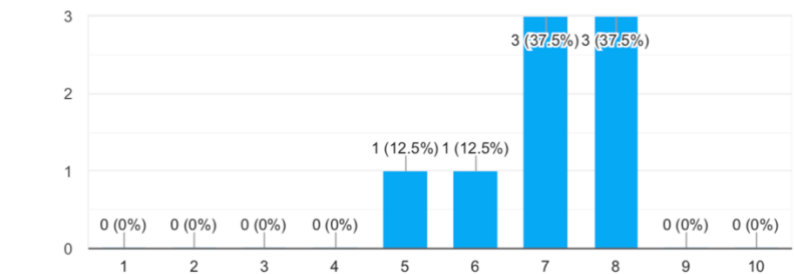
Which of these statements do you associate with green debt financing?

8 responses



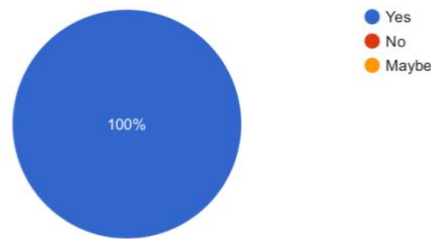
To what degree do you feel green financing addresses climate change?

8 responses



Do you believe green debt financing is essential for the shipping industry in order to be able to meet the standards of the 2050 IMO regulation on reducing GHG emissions by 50%?

8 responses



How do you believe green debt financing will impact the future of shipping?

6 responses

It will aid in the green transition across the industry.

It might help create green innovation, and if so then it can facilitate the transition.

Maritime transportation will continue to be a key sector for the global economy and we believe that the financial institutions have to play an important role to promote sustainable development and green initiatives in the global decarbonisation process. The Poseidon Principles will help all participants to achieve the GHG reduction goal and build up a greener industry.

Although we believe that the future of shipping will be positively impacted by green financing, one downside might be that companies that struggle to find green financing after some time will fade out of the industry.

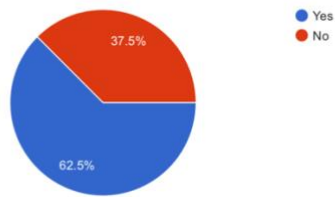
There will be an increase in environmental criteria which will aid the green transition.

If subsidized green debt finance helps to facilitate innovation, it will for sure have an impact on the future of shipping. But - taken into account that the economic life of a

Section four: Responded Summary

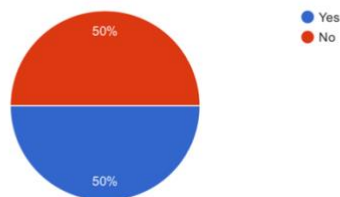
Are you interested in the results of this survey? If yes, then the answers will be sent to you on email after the survey's time span.

8 responses



I am currently doing similar questionnaires for shipping companies and organizations as well. If you are interested in this, please indicate below.

8 responses



Shipping Companies:

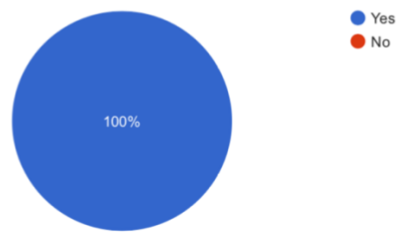
Section one: Introductory part

Including private information, thus left anonymous.

Section two: Policy

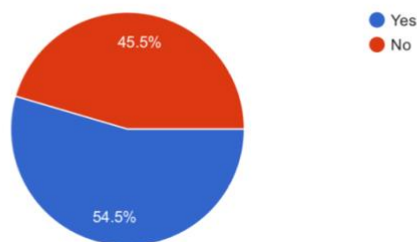
Does your company incorporate environmental and social sustainability elements in your vision and strategy?

11 responses



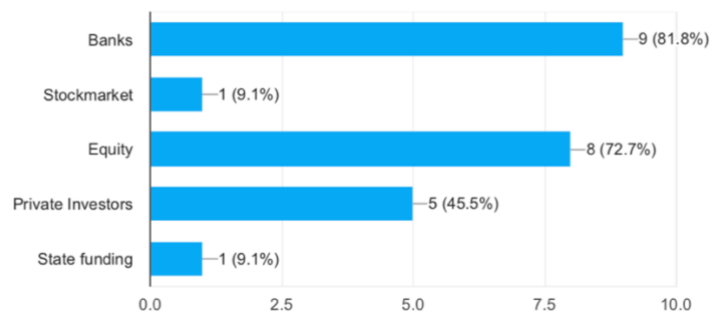
Is your institution a signatory or member of the global initiatives related to sustainable development and green finance?

11 responses



From where does your company acquire funding?

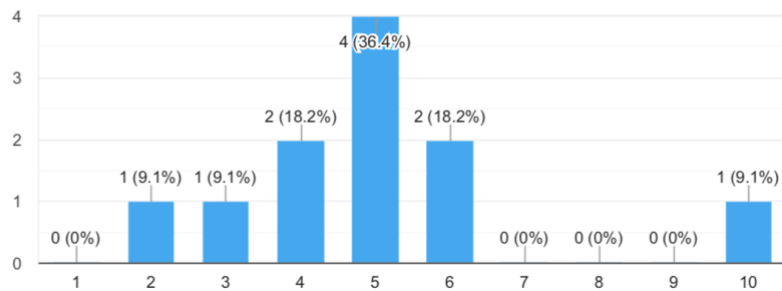
11 responses



Section three: Impact

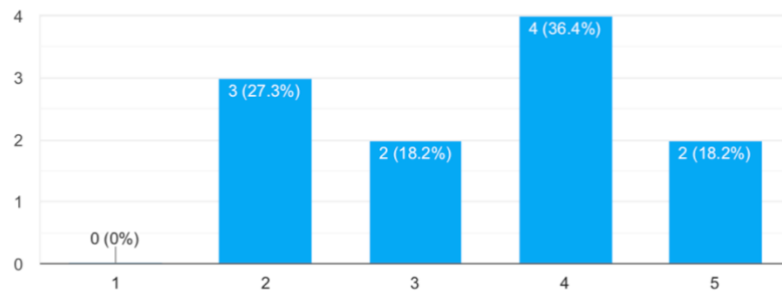
To what degree are environmental issues affecting your institution's business risk?

11 responses



In your opinion, how difficult is it currently to get debt financing for shipping companies?

11 responses



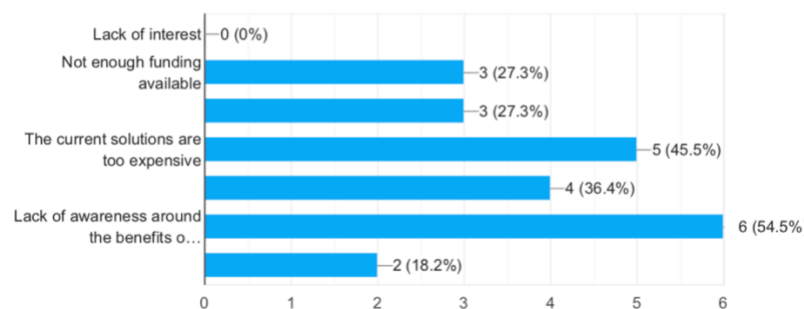
*Add Comment:

1 response

As green debt financing is considered to be a 'new' funding method it is important for banks and other financial sources to promote, thus we feel that much of the green debt financing goes to larger shipping companies with more exposure. However, after green investment has become more popular we believe that it will be much easier to obtain funding as more parties will become aware of the benefits.

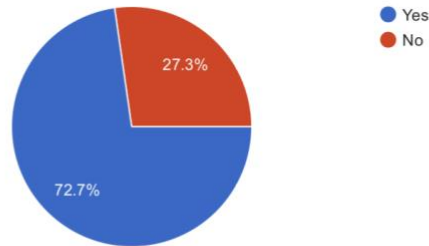
In your opinion, what is the largest barrier the shipping industry is facing when it comes to green investment?

11 responses



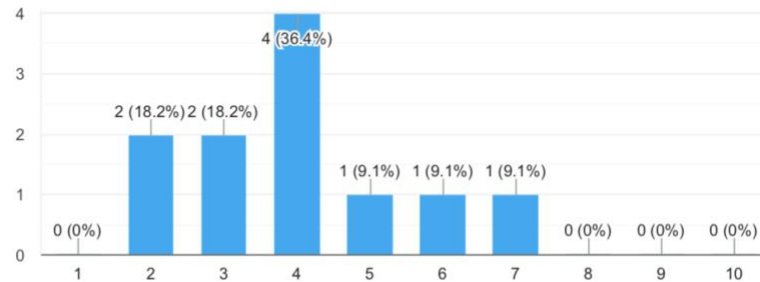
Short-termism is considered to be the 'concentration on short-term projects for immediate profit at the expense of long-term securities'. Do you consider the current focus on short-termism an obstacle for green debt financing?

11 responses



In what degree do you see the current pressure of environmentally friendly solutions a threat to the shipping industry?

11 responses



What do you feel is missing when it comes to shifting towards greener opportunities for shipping companies?

7 responses

Industry standards.

Transparency through all the industry actors.

A clear pathway of what technologies and solutions which will work for the long term. There has been certain environmental solutions introduced to the shipping industry which have been proven to lack the long term effects. Such as the scrubbers introduced as a solution to the global Sulphur Cap.

Transparency between banks and companies

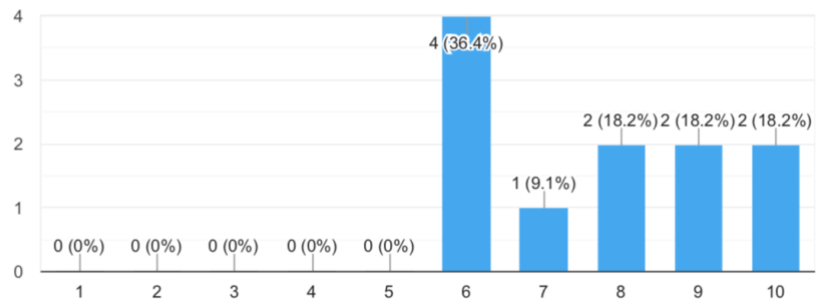
Transparent guidelines on green finance criteria, in combination with too expensive environmentally friendly solutions compared with the already existing non-environmentally friendly technologies.

Sustainable guidelines that are similar through the whole industry.

A global collaboration on the matter.

In what degree do you see the current pressure of environmentally friendly solutions an opportunity for the shipping industry?

11 responses



How large of a role do you consider green debt financing to have when it comes to reaching environmental goals set by international organisations and governments?

8 responses

Very large, as new environmental regulations acquire companies to be sustainable throughout various aspects of the business.

Very large role.

In order to be more sustainable within the shipping industry there needs to be a transparency through the whole life cycle of a vessel, all the way from the loan agreement of a new vessel to the end of life of the vessel.

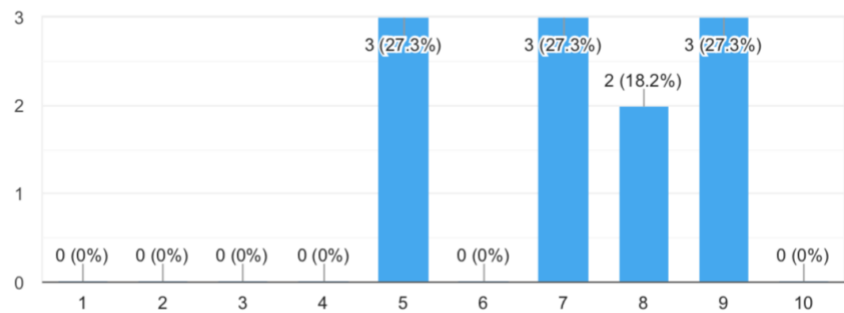
Very large role.

It depends on the technologies fostered by green financing. If it can create more technologies which are cheaper than green finance will play a major role in reaching environmental goals.

In a very large degree. We are determined to reach our ultimate target of becoming fully carbon neutral by 2050, and this is why we believe that green financing serves as another enabler for us to deliver on that ambition.

In what degree do you feel green debt financing addresses climate change?

11 responses



How has the criteria of obtaining financing for shipping companies changed over the years?

7 responses

After the financial crisis it has become more difficult to obtain financing.

It has become more usual to acquire funding from alternative sources.

Banks have slid more out, while alternative sources has become more popular. Financing from Asia has become more important to the Europeans.

There is less funding available and thus the criteria have become stricter.

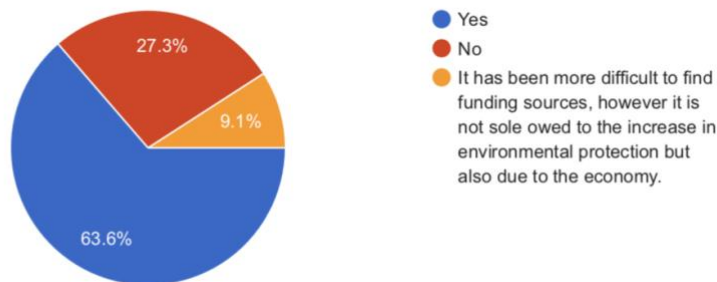
Stricter, but we have mainly felt that due to the situation after 2008.

There has been less financing available and therefore the criteria have become stricter.

Become stricter. Especially after the introduction of the Basel regulations.

Has it been more difficult to acquire funding over the last five years (after the increased interest in environmental protection)?

11 responses



*If yes, what are the main reasons for the difficulty?

4 responses

There is an increase in green technologies which makes it difficult to find the right bank for the right project.

There is a lack of guidelines on what technology is best suited. Due to the lack of guidelines it is difficult to know what banks in general are looking for. In Europe green investment is becoming more popular and important, but in other countries such as China and the USA the green financing is not as popular yet.

Lack of funding available

Cost of new technologies

What do you feel your banks can do better to promote green financing?

8 responses

Specific list of criteria available to the customers.

Keep their clients engaged in the discussion on the topic in order to create a system that works for all parties.

There needs to be an overall strategy between the banks to make it easier to acquire green funding.

Share their knowledge on the subject in order to discuss the information available to the shipping industry.

Be more interactive with their clients in order to implement successful policies.

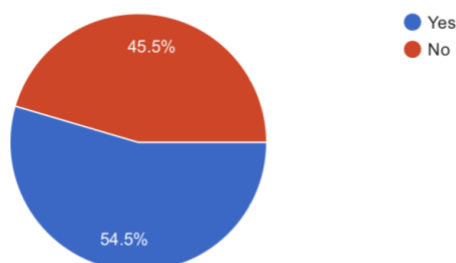
Transparency when it comes to their criteria

Be transparent about the criteria of a green financing opportunity.

Have specific rules on what is needed to obtain the new type of financing.

Do you feel there is enough green debt financing available for your company?

11 responses



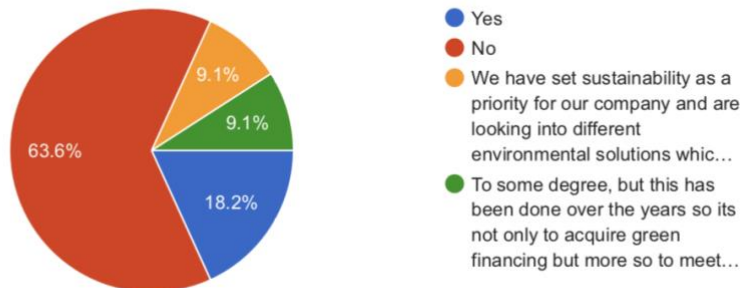
*Add Comment:

1 response

We have been able to acquire a large sustainable loan through various banks.

Has your company changed the way you operate in order to acquire green debt financing?

11 responses



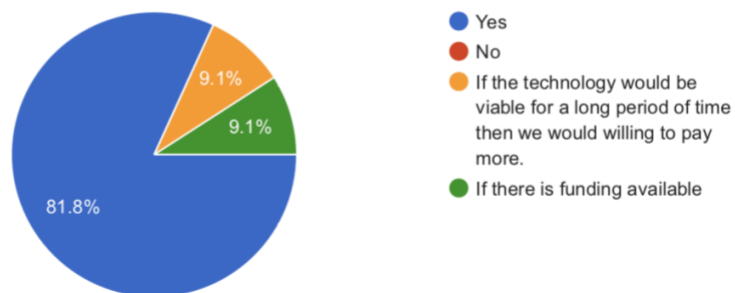
*Add Comment:

1 response

Not to directly obtain green debt financing, but more to become more sustainable as a cooperation.

Are you willing to pay more for green initiatives/solutions?

11 responses



*Add Comment:

1 response

If green solutions had a guarantee to last long term then we see no issue investing in them.

How do you believe shipping companies and financial creditors can come together in order to establish a greener economy?

7 responses

Create an industry standard which will work as a guide to green financing.

Open the discussion on the criteria needed for green financing.

Create transparent guidelines on green investment and sustainable technological solutions which can make it easier to understand what is needed in order to meet environmental regulations.

Create a list of environmental technologies that are eligible for green financing.

Discuss and create a transparent measures.

Companies and banks can come together and create a transparent guideline and share knowledge on the subject throughout the industry.

Create an open discussion on what is needed to make this concept successful.

How can green investment facilitate shipping companies business models in order to become more sustainable?

7 responses

Getting capital through banks is regarded as the largest bottleneck for bringing business model innovations to the market, thus it can facilitate the business model to become more sustainable

It will allow shipping companies to be green through the whole company business model.

Not our goal.

Transparency with customers.

Becomes green through the birth of the vessel to the scrapping of the vessel.

reduce its environmental impact as opportunities to create new businesses, diversify its business portfolio and address new challenges in technical innovation

Transparency through the whole of the vessels life-cycle.

How do you believe green debt financing will impact the future of shipping?

7 responses

Create a more sustainable industry by bridging the gap to commercially decarbonising the shipping industry.

Create more technological sustainable solutions.

It might make it easier for shipping companies to meet environmental regulations.

Make the industry more aware of the implications environmental issues.

it will work as an opportunity for shipping companies and banks to come together thus bridging the gap the industry currently is facing.

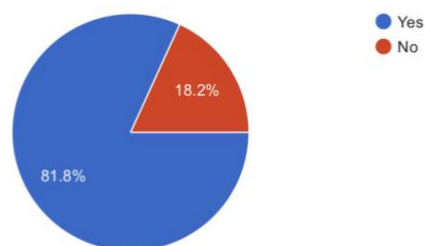
It will aid in the transition of making the industry green and make it easier for the individual companies to become sustainable.

Make the green transition less expensive as the concept of green financing will become more popular with such a concept in place.

Section four: Responded Summary

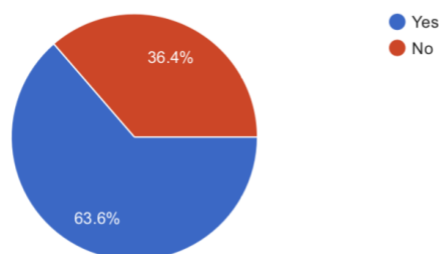
Are you interested in the results of this survey? If yes, then the answers will be sent to you on email after the survey's time span.

11 responses



I am currently doing similar questionnaires for banks as well. If you are interested in this, please indicate below.

11 responses



Organisations:

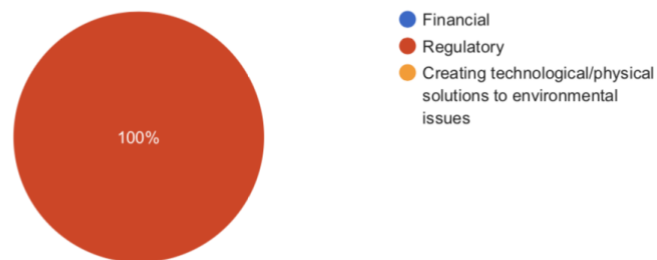
Section one: Introductory part

Including private information, thus left anonymous.

Section two: Policy

In which area of environmental protection does your organization work within?

2 responses



How does your company help promote green initiatives?

4 responses

Work with creating regulations for the shipping industry

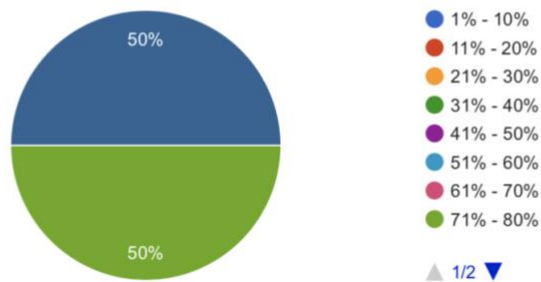
Through the European Sustainable Finance initiative, notably the Sustainable Europe Investment Plan and the 2018 Action Plan on Financing Sustainable Growth, as well as related legislation (EU Taxonomy, Disclosure Regulation, Low-carbon Benchmark Regulation).

We promote policies aimed at the protection and restoration of the marine and atmospheric environment that are consistent with the safe operation of ships, sustainable development, social and economic justice, and human health

We work to create a platform for stakeholders to come together and discuss issues in the above areas, and support them to create collaborative cross-value chain change together (through workshops, meetings, etc)

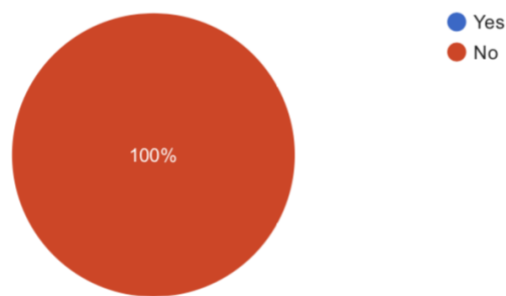
Roughly, what is the success rate of the green projects that your institution has already contributed in?

2 responses



Does your organization promote green debt financing?

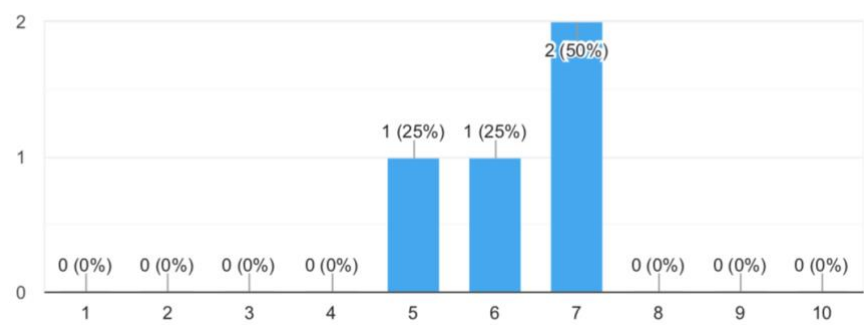
3 responses



Section three: Impact

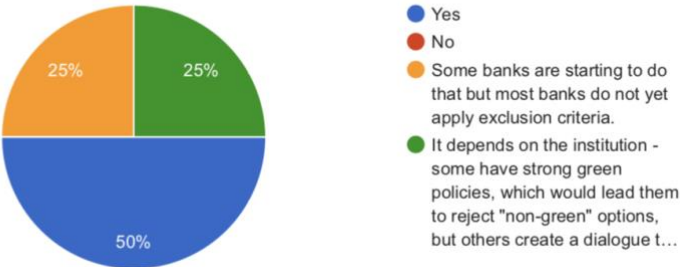
How difficult do you consider the green transition to be?

4 responses



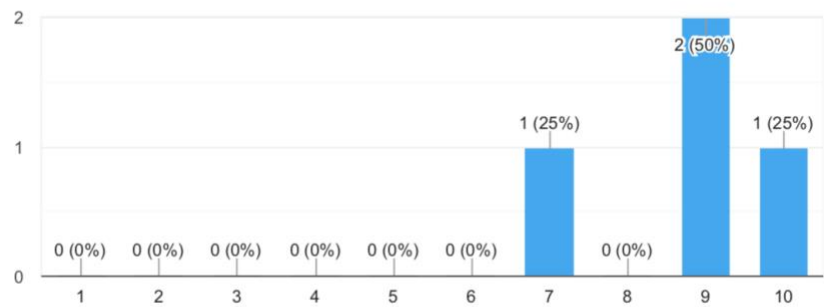
Do you feel banks reject investments based on their green policy?

4 responses



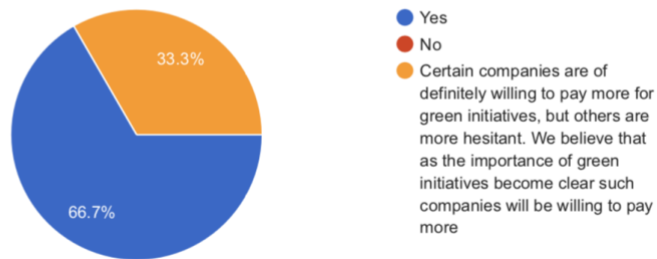
How important do you think green debt financing is when it comes to the shipping industry?

4 responses



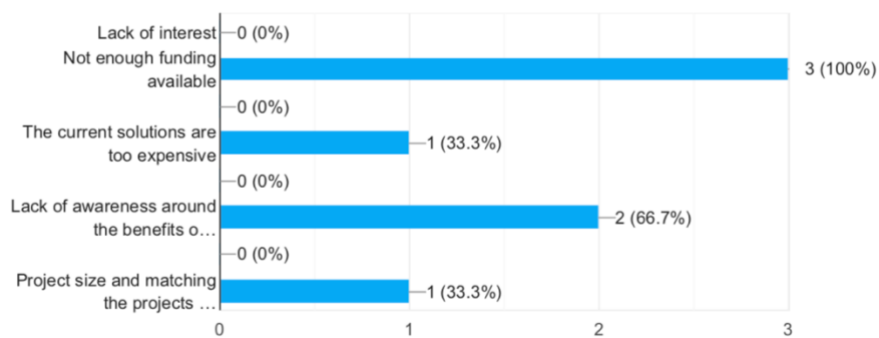
Do you feel companies are willing to pay more for green initiatives?

3 responses



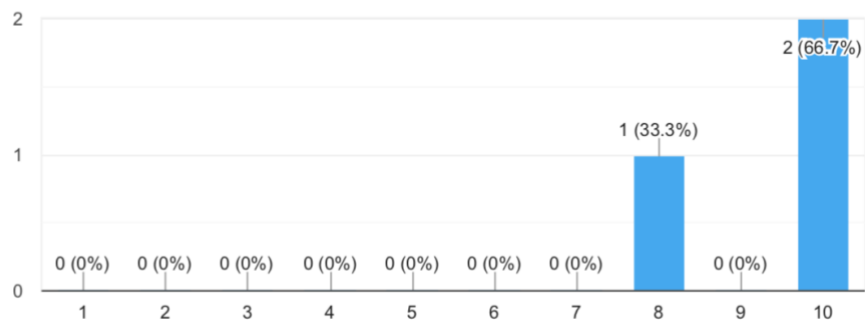
What do you consider the largest barriers to green investment to be?

3 responses



How important do you think the collaboration between banks and shipping companies is in order to make green debt financing work?

3 responses



How do you believe the shipping industry and financial creditors can come together in order to establish a greener economy?

3 responses

Create an overall standard for green financing within the industry.

Have transparent knowledge on the area between the shipping industry and financial creditors.

The first barrier to overcome would be around knowledge sharing on the opportunity at hand - more awareness on the scale of the issue will lead to the right discussions between the shipping industry and financiers to overcome the finance gap

What do you feel banks can do better to promote green financing?

3 responses

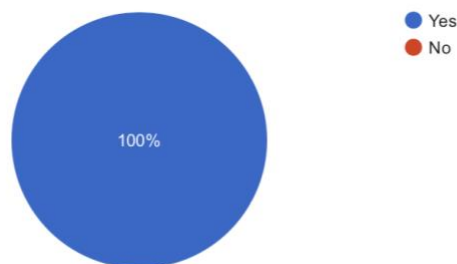
Be transparent around the criteria around obtaining green financing.

Join ventures with other banks, like adopting the Poseidon Principles. Further, support shipping regulations by upholding the thresholds.

They can become Signatories to the Poseidon Principles, or hold themselves to Paris Agreement aligned targets

With the next major environmental goal/regulation for the shipping industry reaching its threshold, namely the the 2050 IMO regulation on reducing GHG emissions by 50 % of the 2008 levels, do you believe green debt financing is essential?

3 responses



How do you believe green debt financing will impact the future of shipping?

3 responses

It will promote green solutions and later create a more sustainable industry.

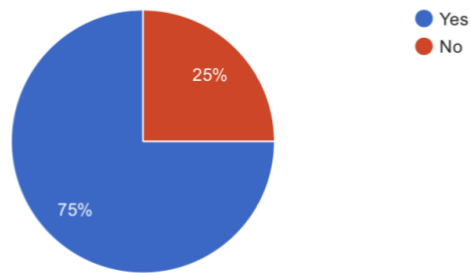
It will make it easier to comply with environmental regulations and therefore aid in the process of decarbonizing the industry.

Finance is needed to bridge the gap to commercially viable decarbonized shipping- but this should be seen as an opportunity for shipping and financiers, not a barrier.

Section four: Responded Summary

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4 responses



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4 responses

