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A Study of the Implications of the EU ETS for Chemical Tanker Shipping Companies

How will chemical tanker shipping companies legally and practically transfer the EU ETS costs to their customers?

Bachelor's thesis in Shipping Management
Supervisor: Jan Emblemsvåg
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Abstract

The EU Emission Trading System (EU ETS), which was established in 2005, is part of the EU's overall strategy to reduce greenhouse gas emissions. The pressure to decarbonize is increasing. As maritime transport is responsible for 3% of the global greenhouse gases, the EU has expanded the system to include the shipping industry, thus ensuring that the EU meets their target of 55% reduction in total greenhouse gas emissions by 2030 compared to 1990 levels in order to achieve their overall mission which is to become climate neutral by 2050 with net zero greenhouse gas emissions. The shipping industry will be included in this system from January 1st, 2024. As a consequence of this, new rules and regulations must be developed to adapt to the system. This leads to several unanswered questions that need to be addressed before the system takes effect. This study explores through a qualitative approach how two Norwegian chemical tanker shipping companies, one operating deep-sea and the other short-sea, perceive the implications of the EU ETS. By conducting eight semi-structured interviews in the two shipping companies, the hope is to shed light on how chemical tanker shipping companies legally and practically will transfer the EU ETS cost to their customers.

In light of the interviews, we found that both companies had prepared their own versions of EU ETS clauses specifically adapted to how they each operate, where the cost will be transferred to their customer based on the polluter-pays-principle. The Sea Cargo Charter (SCC) guidelines will be incorporated into charter parties and contracts of affreightments and utilised in cases where the vessel sails in ballast or laden, or in cases where there are several customers on the same voyage. In situations where the ballast-legs occur without planned cargo and the vessel positions itself closer to specific regions, the shipping companies saw it as a possibility that they had to cover that expense themselves. The companies stated that it will be up to the customers on how the EU ETS cost is paid, even though they expressed a preference for them paying in carbon allowances as it would involve less work and risk. Furthermore, both companies put great importance on being transparent with their customers, which will make it easier for the customers to accept the EU ETS costs shipping companies transfer to them. By conducting this research, the hope is to contribute to relevant findings to this field which might be useful to others in the maritime industry.

Preface

This thesis was written during the fifth semester as a requirement for partial fulfilment of a bachelor's degree in Shipping Management at the Norwegian University of Science and Technology (NTNU) in Ålesund, at the Department of Ocean Operations and Civil Engineering. The thesis was written by the students while being interns at Odfjell and Utkilen. Both students have been engaged in researching and writing this thesis from August to December 2023.

The thesis examines the implications of the EU ETS for chemical tanker shipping companies by looking more in detail as to how chemical tanker shipping companies legally and practically will transfer the EU ETS costs to their customers. The research question was chosen based on several factors such as having internships in two different Norwegian chemical tanker shipping companies, having a natural curiosity of the present circumstances in the world of shipping and based on the companies' proposal.

We would like to extend our thanks to Professor Jan Emblemsvåg who has been our supervisor and helped us while writing this thesis. An additional thanks to Utkilen and Odfjell for welcoming us with open arms during our internships and for providing resources and assisting us in answering any questions we might have. Lastly, a special thanks to the study participants for partaking in the interviews and for providing detailed data.

Bergen, 17.12.2023



Tuathla Honne



Tobias Natadal

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Abbreviations

ARA	Amsterdam-Rotterdam-Antwerp region
BIMCO	Baltic and International Maritime Council
CII	Carbon Intensity Indicator
DWT	Deadweight Tonnage
EEA	European Economic Area
EU ETS	European Union Emissions Trading System
EUA	European Union Allowances
GHG	Greenhouse Gases
GT	Gross Tonnage
IMO	International Maritime Organization
IPCC	International Panel on Climate Change
MGO	Marine Gas Oil
MRV	Monitoring, Reporting, Verification
SCC	Sea Cargo Charter
UNFCCC	United Nations Framework Convention on Climate Change
VLSFO	Very Low Sulphur Fuel Oil

Chapter One: Introduction

The 20th century undoubtedly saw the greatest anthropogenic climate change in history due to an increase of greenhouse gas emissions. By the end of the century, during the 1980s and 1990s there was a growing awareness of climate change risks and the associated need to reduce greenhouse gas emissions. This resulted in among other things, the establishment of the International Panel on Climate Change (IPCC) in 1988, with the aim to gather and assess evidence on climate change. In 1992, the United Nations Framework Convention on Climate Change (UNFCCC) was signed and has since its establishment served as the foundation for international climate negotiations, such as the Kyoto Protocol enacted in 1997 and was later replaced by the Paris Agreement, which entered into force in 2016 (Hirst, 2020). The Kyoto Protocol was the first international treaty that for the first time set legally binding emissions reduction targets for 37 industrialised countries. As a result, policy instruments were required to meet these targets. This resulted in the first drafts of the EU ETS, which led to the adoption of the EU ETS Directive in 2003 and the start of the system in 2005 (European Commission, 2023).

1.1 Carbon Trading System

During the late 1990s, public debate was mostly centred on how to create a single global market for trading carbon permits as “the vehicle” to solve global climate change. The thought behind this was that one tonne of greenhouse gas emitted anywhere in the world has the same effects on climate change for everyone. Thus, creating a worldwide market that equalised incentives to reduce emissions everywhere would be an economically desirable result. However, this seemed to be a far-fetched dream as we today can observe a variety of regional, national and subnational markets already operating or being under development such as in China, Canada, Japan, New Zealand, Switzerland, South Korea and the United. The EU ETS being nonetheless the most notable (Newell, et al., 2013, p. 123). As of the beginning of 2022, there were in total 25 operational emissions trading systems globally, and the number of emissions trading systems around the world will continue to increase (ICAP, 2022, p. 35).

The pressure to decarbonise is increasing as people and governments recognise the dangers of anthropogenic climate change. The EU has set a goal to become climate neutral by 2050

with net zero greenhouse gas emissions. To ensure that the EU policies are in line with the agreed climate goals by the initiative of the Council and European Parliament, the Fit for 55 package was proposed in 2021. As part of the package, the previous directive was replaced by the amended EU 2023/959 directive, reforming EU ETS by further expanding the system to include shipping (Directive 2023/959). As maritime transport is responsible for 3% of the worldwide greenhouse gases, this inclusion will ensure that the EU meet their 2030 target of 55% reduction of greenhouse gas emissions compared to 1990 (King, 2022).

The EU will adopt a carbon tax for shipping, starting from January 1st, 2024. A precursor of this inclusion was the mapping of all shipping emissions in the EU with the mandatory data collection through Monitoring, Reporting and Verification (MRV). The first reporting period of MRV was in 2018. These reports are applicable for all vessels of 5000 gross tonnage (GT) and above during EU related voyages and provide firm numbers of emissions. Reporting must be verified by an accredited verifier to be accepted, and all emission data is available in the Thetis-MRV system (European Council, 2023). Shipping, which is essential for global trade, contributes significantly to the emissions that cause climate change. It is estimated that ships transport more than 10 billion metric tonnes of cargo each year. Almost all of these ships run on fossil fuels, which means that they are big emitters of carbon dioxide emissions. Emissions from the maritime transport are expected to further increase in the future due to an expansion of this mode of transportation and its existing high reliance on oil derivatives (ICAP, 2022, p. 19).

Other nations have also showed an increasing interest in expanding existing emission trading systems to also cover international shipping such as China and Japan (Sheperd, 2022). The UK has announced that shipping will be included in UK ETS from 2026, with details awaiting further consultation (Gov.UK, 2023). The Clean Shipping Act of 2023 is a legislative proposal in the US which aims to reduce emissions from shipping by progressively setting more stringent carbon intensity standards, consistent with the Paris agreement goals (Padilla, Whitehouse, 2023). Following this, the US has also seen an additional decarbonisation legislation proposal that involves carbon tax such as seen in the EU ETS (Raanan, 2023).

1.2 Research Aims and Objectives

The subject of this study is the implications of the EU ETS for chemical tanker shipping companies. The EU ETS is a highly relevant topic, not only due to shipping being included in the system, but also on a world basis as it is part of the EU's strategy to reduce greenhouse gas emissions and plays a significant role in combating climate change. The inclusion of the shipping industry in the EU ETS is thus an important part of the EU's long-term strategy to achieve their goal of becoming climate neutral by 2050.

There are several avenues for reaching the targets including investing in new emission reduction technology and switching to alternative fuels. However, there are significant uncertainties regarding the feasibility and scalability of these approaches. Consequently, shipping companies will explore alternative methods of handling costs imposed by the EU ETS, as the significant costs are a major concern for shipping companies operating in the EU.

According to the official EU directive, article (31), the "Shipping Company" is responsible for EU ETS compliance, which means that they are responsible for submitting allowances. The "Shipping Company" is defined as "... the shipowner or any other entity, such as the manager or bareboat charterer, that has assumed the responsibility for the operation of the ship from the shipowner and thereby agreed to take over the duties and responsibilities imposed by the international safety management Code for the Safe Operation of Ships and Pollution Prevention" (2023/959, 2023). To avoid being negatively affected, shipping companies will want to transfer these costs to the customers. Thus, this brings us to the following research question:

Research Question:

How will chemical tanker shipping companies legally and practically transfer the EU ETS costs to their customers?

To answer this, we will conduct a review of the existing relevant literature and look into the chemical tanker segment through two cases by delving into one short-sea and one deep-sea chemical tanker shipping company, Utkilen AS and Odfjell SE. By examining both a short-sea and deep-sea company we ensure a thorough representation of the entire segment. Both

companies will be affected by the EU ETS Directive as they operate within the EU. Utkilen focuses on intra-EU operations, while Odfjell primarily engages in intercontinental routes to and from the EU. An extensive reform in a sector such as shipping being included in the EU ETS raises a number of uncertainties and questions and we will therefore not be able to cover all aspects of the implementation. Considering time constraints and our part-time work commitments during the semester, we chose to address only one research question to ensure depth and quality in our research.

1.3 Structure of the Thesis

This thesis is divided into six chapters. Chapter One provides background information regarding the topic of the thesis. Chapter Two presents relevant literature in order to contextualise the forthcoming research. Chapter Three explains and justifies the research methodology employed, where the method for data collection and the selection of the participants will be explained. Chapter Four presents the findings, followed by Chapter Five which discusses the significance of the findings in light of the literature review. The chapter will also present the limitations of this study and avenues for future research. Chapter Six summarises the main conclusions of the thesis.

Chapter Two: Literature Review

Emission Trading is generally regarded as the primary market-based mechanism for addressing environmental challenges. This section will present the literature regarding one such emission trading system, the EU ETS, due to its relevance to the topic of research. Overall, there is a large body of social science literature on the EU ETS where previous contributions tend to concentrate on certain phases, such as initiation and decision-making or implementation (Skjærseth & Wettestad, 2009). In recent years the EU ETS has received particular attention as a tool to combat climate change, thus there is a substantial body of research that has investigated this system, from both a legal and economic perspective. Other studies explore its environmental impact. Little to no research has been done about EU ETS in shipping, as the implementation is yet to commence and there are no specific figures and numbers to refer to yet.

As indicated in Chapter One, the implementation of shipping in the EU ETS is expected to have a significant financial impact on shipping companies. Furthermore, what needs to be further investigated is the practical and legal aspects of the inclusion. This study hopes to shed light on the implications of EU ETS for shipping companies in the chemical tanker segment. This chapter will present relevant literature in order to develop the framework for elucidating the problem statement.

This section will first introduce carbon markets, followed by an overview of the EU ETS and the general literature pertaining to this specific market. Different aspects of the emission system as a market-based environmental tool will be presented in order to get a better understanding of the topic. Literature about the economic and legal aspects will also be presented, before summarising the findings in the concluding section of the chapter.

2.1 Carbon Markets

The EU ETS is presently the world's major carbon market. Carbon markets are currently the largest class of environmental or emissions trading markets worldwide, in terms of market value. Although certain regional classes of environmental trading markets govern emission limitation of several greenhouse gases, the denominating unit of measurement is carbon

dioxide equivalent as it is the most prominent gas when it comes to contribution to global warming. Thus, the term “carbon market” is a common denomination.

As mentioned earlier, several carbon trading programs have emerged since the 1990s. By the end of 2012 the great majority of carbon markets took place in the following five arenas: the European Union’s Emission Trading System (ETS); the Clean Development Mechanism (developed under the Kyoto Protocol); the Regional Greenhouse Gas Initiative (in northeastern United States); New Zealand’s Emission Trading Scheme; and voluntary markets (Newell, et al., 2013, pp. 123-124). Until 2021, the EU ETS dominated the market with significantly greater volumes and liquidity than any other market. However, in 2021 the Chinese ETS was launched and has since become the largest carbon market in terms of emissions regulated (Roldao, 2022). An indication that these above-mentioned carbon markets are reducing emissions is a consistent positive price on carbon allowances. If the market was not constraining emissions, the allowance supply would surpass total demand and price would move near zero (Newell, et al., 2013, p. 131).

2.2 About EU ETS

The EU ETS is the first international emission trading system in the world, which currently operates in 27 EU Member States and the EEA-countries Norway, Iceland and Liechtenstein. It is a market-based mechanism created with the goal to lower greenhouse gas emissions from the most power and energy-intensive industries by setting a price on CO₂. It currently covers over 14,000 energy-intensive plants across the European countries. In total, around 45% of the greenhouse gas emissions are regulated by the EU ETS (European Commission, 2023).

The program has since its establishment operated in phases. The first phase, which was from 2005 to 2007 was a pilot phase and covered only the greenhouse gas emissions from the power generators and energy-intensive industries. During this period the price of the allowances fell to zero in 2007 due to an excessive number of allowances. In the second phase which was from 2008 to 2012, the number of allowances was further reduced around 6.5% lower compared to 2005. Norway, Iceland and Liechtenstein became members of the program and the aviation sector joined by the end of the second phase in 2012. The third

phase which was from 2013 to 2020, was characterised by a major reform of the EU ETS framework changing the system significantly compared to the previous phases. The main changes included a single EU wide cap on emissions. The cap would also decrease annually by 1.7%. More sectors and gases were included. Furthermore, there was also a shift towards auctioning allowances instead of free allocation. The fourth phase, which we currently are in, started in 2021 and will last until 2030. The main changes are a further decrease in allowances at a rate of 2.2% yearly, as well as stricter criteria for free allocation and focusing on sectors which are at higher risk of relocation outside the EU. In addition, one of the main changes will be the inclusion of the maritime sector in the system (European Commission, 2023). For the maritime sector, there will be a three-year phase-in period, during which 40% of the emissions reported in 2024 must be paid for in 2025, 70% of emissions reported in 2025 must be paid for in 2026 and 100% of emissions reported in 2026 onwards must be paid for in the following year (Sørås, 2022).

The EU ETS is based on the cap-and-trade principle, meaning that the EU sets a limit on the total amount of greenhouse gases that can be emitted. Over time, the cap is gradually reduced, lowering the permissible emissions. Companies can buy and sell allowances on the carbon market (Kenton, 2020). With shipping being implemented in the EU ETS, operating companies will be obligated to possess an adequate number of allowances to cover all ships which they are responsible for and submit the settlement by September 30th each year. The required number of allowances must be transferred to the account of the administering authority. Companies that fail to submit allowances are subject to a fine of EUR 100 per tonne of CO₂ and are still responsible for surrendering required allowances. Failing to comply for two consecutive periods will result in being denied entry to the EU with all vessels under the company's responsibility. To show proof of accurate emission quantities, shipowners must submit emission reports for each vessel as well as an aggregated report which covers the whole fleet, submitted by March 31st. Both monitoring plans for each ship, and reports must be approved on behalf of the authorities by a verified accreditation service (Miljødirektoratet, 2023).

2.2.1 EU Allowances

Each European Union Allowance (EUA) grants permit to emit greenhouse gases equivalent to one tonne CO₂. There are no industry-specific allowances, but rather a consistent regulatory approach with general EUAs applicable regardless of whether the company operates in industry, aviation or shipping. The entirety of CO₂ emissions stemming from voyages and port calls within EU/EEA are subject to EU ETS. Voyages to and from the EU/EEA also fall within the scope of EU ETS, limited to 50% of emissions (DNV, 2023). With the introduction of EU ETS to the shipping industry, the initial scope includes only CO₂ emissions from 2024, while it will extend to include both methane and nitrous oxide from 2026. This inclusion will likely be beneficial as both methane and nitrous oxide emissions are expected to increase as more vessels will run on natural gases or be powered by other energy sources (2023/959).

2.2.2 How Allowances are Acquired

During the pilot and second phase, the system allocated the majority of pollution permits, EUAs, free of charge to each participating emitter in order to limit the annual aggregate CO₂ emissions. The amount and distribution of free allocation to various economic sectors were set by each nation (Newell, et al., 2013, p. 127). The proportion of free allocations has decreased gradually and is soon to be phased out completely for multiple sectors, which means a change from gratuitous allocation to procurement-based approach. The fourth phase continues this transition with its revision of free allocation to focus on sectors where there is high risk of relocating to outside the EU, while less susceptible sectors will see the free allocation being phased out towards 2030 (European Commission, 2023).

There are several ways to acquire allowances, which makes it crucial for companies to investigate the best strategy adapted to their own operations and required quantities. The primary method of obtaining emission allowances is through auctioning. There are several auctions throughout the year, arranged by the European Energy Exchange (EEX) on the authority of the EU. Allowances are at these auctions available for purchase at a fixed price. Alternatively, companies may trade on the secondary market through brokers or online platforms. These over-the-counter markets and exchanges are volatile with fluctuating prices in accord with supply and demand (DNV, 2023). In the early years following the inauguration

of ETS, the trading consisted mostly of unstandardised over-the-counter transactions. This, however, was surpassed by exchange-based trading already in 2008, indicating maturity in the market with increased liquidity and standardisation levels (Ellerman, et al., 2010). At the present time there is also an option to bank allowances, conveniently applicable when emissions are believed to be greater in future years to ensure sufficient allowances. The total availability of allowances is regulated by the EU. To ensure stability in the market, the number of allowances are reduced when too many are in circulation and put into the stability reserve. These are released to stabilise prices in case of shortages in the market, but the total amount will always remain below the target amount in line with the EU's environmental goals (DNV, 2023).

2.2.3 Carbon Leakage

Carbon leakage refers to a situation in which industries relocate operations to areas with less stringent environmental regulations, especially in relation to carbon costs. If companies move production to other areas where they can pollute freely, it undermines the effectiveness of measures to reduce worldwide emissions. To avoid carbon leakage, the EU ETS provides free allocation of allowances to certain industries at significant risk of relocating. The goal is to safeguard European competitiveness, while still encouraging emission reduction measures. The shipping industry will not receive any free allowances (European Commission, 2021).

2.3 Impact of the EU ETS on Economic Performance in Various Industries

Concerns about potential cost burden on industry were widely expressed as a result of the introduction of the EU ETS. In general, regulated firms must either incur costly abatement or purchase EUAs, both of which reduce profitability. Furthermore, there is also the risk of them losing market share to rival companies outside the EU ETS (Martin, et al., 2016, p. 8). Model-based research anticipated that with carbon pricing around €20–30/tonne CO₂, the marginal cost impacts on the great majority of industrial activities would be minor (Dechezleprêtre, et al., 2018, p. 6). Sato et al., (2014, cited in Dechezleprêtre et al., 2018, p. 6) states that large impacts could occur in upstream segments of several energy-intensive sectors such as iron and steel, aluminium, paper, basic organic chemicals, or fertilisers.

Despite what was initially believed regarding the energy-intensive sectors, the study reveals that the revenue, profitability, fixed assets and employment of regulated business have not been adversely impacted by the EU ETS. Contrary to expectations, it appears that the EU ETS has increased the fixed assets and revenues of regulated companies. One possible explanation for this is that the EU ETS compelled regulated business to invest more money, most likely in carbon-saving equipment, which may have raised productivity. Another possibility is that the EU ETS has increased product quality as well as diversifications through new product lines (Dechezleprêtre, et al., 2018, pp. 6, 17).

As mentioned earlier, the aviation sector was included in EU ETS in 2012, and this inclusion is the obvious parallel to shipping due to several factors. Firstly, the aviation sector was implemented in the EU ETS years after it was established. Secondly, they also share many similarities such as volatile, cyclical markets with high-value depreciating assets. Nava et al., (2018) found that the aviation sector was not impacted negatively economically in the years following the inclusion of the EU ETS. However, Martin et al., (2016) and Giradet & Spinler, 2013, cited in (Nava, et al., 2018) state this may have been due to the massive growth the sector experienced during these years as some researchers have found the EU ETS to reduce profit margins.

2.4 EU ETS Emissions & Costs for Shipping

In addition to having a significant influence on regulatory compliance, emission reduction regulations for shipping will also have an economic impact on aspects such as operating expenses, balance sheets, commercial attractiveness, earning capacity, access to finance and asset value. It is estimated that the EU ETS, once completely implemented in 2026, will result in increased costs for the industry of about €10 billion annually owing to the requirements to purchase carbon credits equivalent to GHG emissions. As a result, fuel-related costs will essentially rise by nearly 50%. These costs will immediately impact the shipping companies financially as they will build up liabilities for emissions from 2024. Shipping companies will experience significant expenses by purchasing EUAs which may cause implications for pricing and contractual agreements between the different parties (Ljungberg, 2023). Costs may vary across the segments as they produce different amounts of CO₂ in addition to

fluctuations in yearly emissions due to changes in supply and demand in the market environment (The Maritime Executive, 2023).

As mentioned in Chapter One, CO₂ emissions have since 2018 been reported and published in Thetis-MRV. Based on the data from Thetis-MRV we have created a diagram, *Figure 1* that shows the CO₂ emissions in the EU from shipping since the start of the reporting period. The diagram shows that emission levels have been somewhat stable, with vessels in the EU emitting a total of 135,7 million tonnes of CO₂ in 2022, which is the most recent data published in Thetis-MRV (EMSA, 2023).

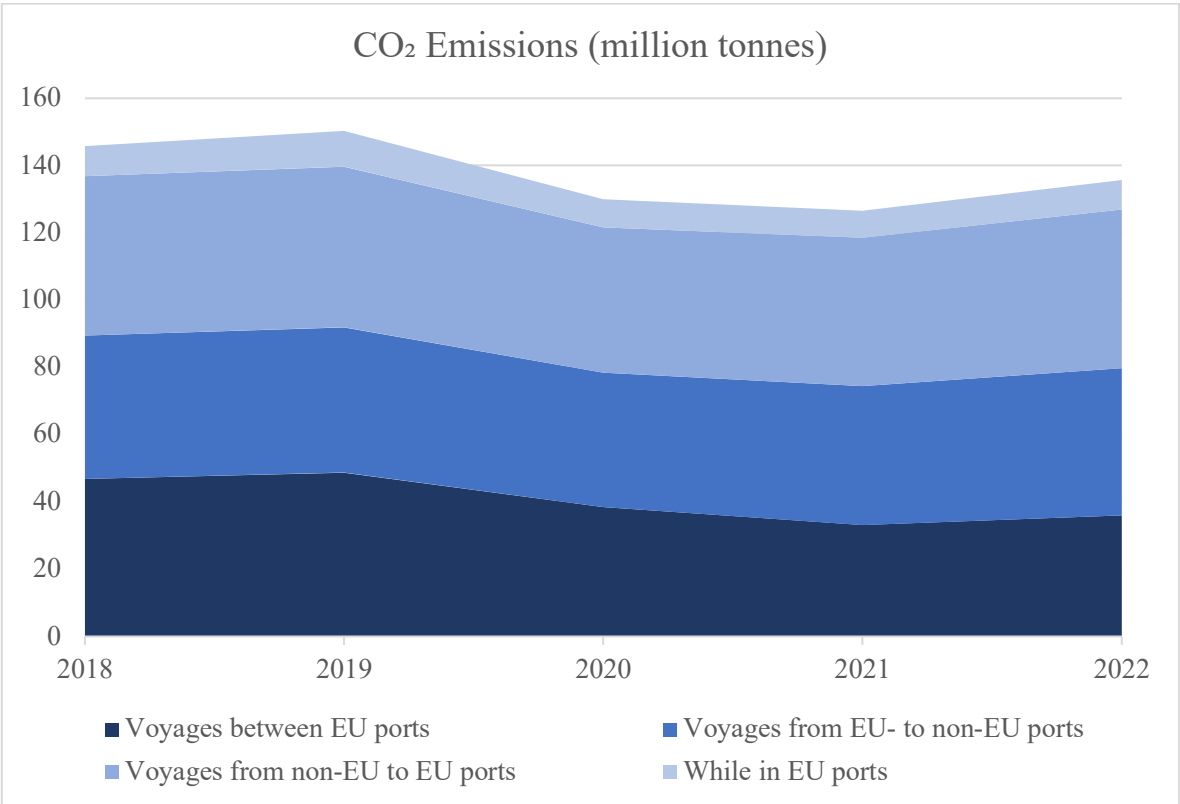


Figure 1: CO₂ emissions from shipping in the EU between 2018-2022. Source: Authors' own calculations based on data from Thetis-MRV (EMSA, 2023).

As this study focuses on the chemical tankers, we have made a diagram as shown in *Figure 2* that illustrates the percentage of the total CO₂ emissions the chemical tanker segment was responsible for in 2022. The diagram shows that 6.5% of the CO₂ emissions come from the chemical tanker segment, which amounts to around 8.8 million tonnes CO₂. The other 93.5%

represent the CO₂ emissions from the other segments which correspond to 126.9 million tonnes CO₂.

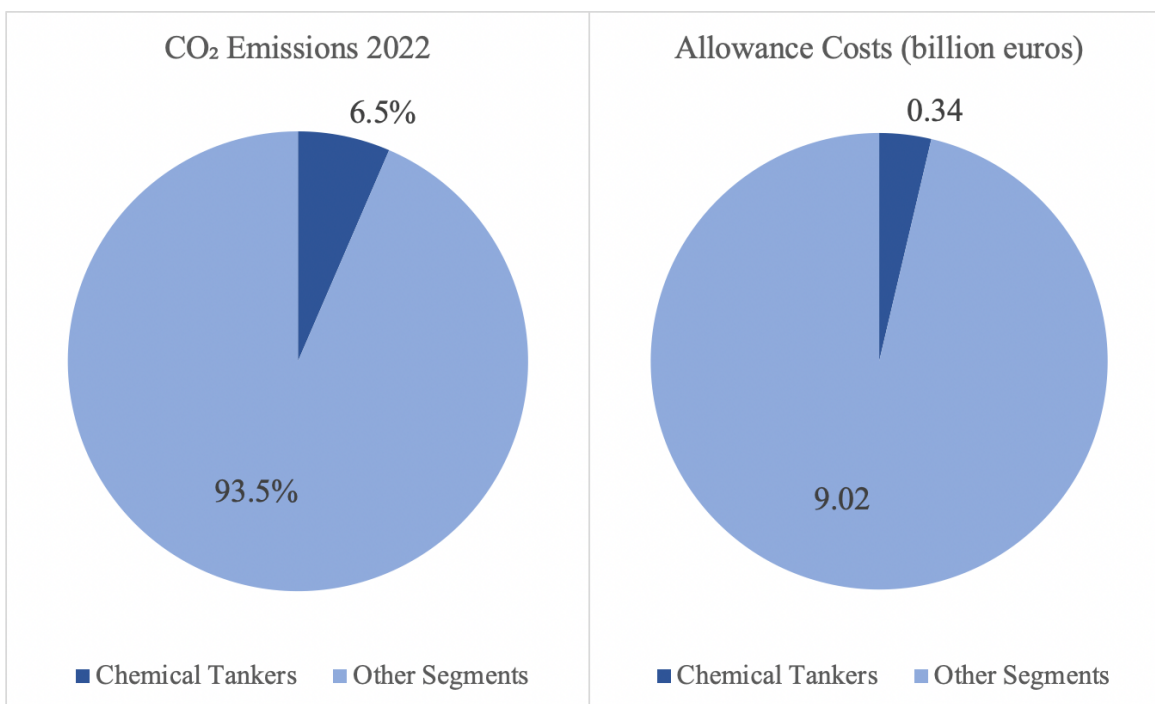


Figure 2: CO₂ emissions from shipping in the EU in 2022 & allowance costs based on 2022 emissions. Source: Authors' own calculations based on data from Thetis-MRV (EMSA, 2023).

To illustrate the annual expenses incurred by the EU allowances, we have created a diagram as shown in *Figure 2* based on the 2022 emissions with an allowance price of €100. The decision of setting the allowance price at €100 is due to a volatile market which is difficult to predict with a current price of €75 (Trading Economics, 2023). With this estimated price, the annual costs of allowances result in a total of €9.36 billion across all segments, with €340 million for the chemical tanker segment. When comparing the diagrams in *Figure 2*, the cost for chemical tanker shipping companies is lower percentagewise than their emissions suggest. The lower relative cost is due to a greater proportion of chemical tanker voyages involving destinations to and from the EU where only 50% of emissions fall within the scope of the EU ETS. It is worth noting that these costs will be annually from 2026, as the mentioned phase-in period requires the coverage of 40% and 70% of emissions in 2024 and 2025 respectively.

2.5 EU ETS Legislation

As shipping will be part of the EU ETS from 2024, new rules and regulations must be developed in order to adapt to the system. To prevent disputes about the EU ETS on matters such as costs and who the responsible party is, shipowners must prepare for different situations and start developing ETS clauses. An important part of this is to define key terms. Furthermore, there is also a need for Member States to encourage emission reduction by ensuring that costs are assigned to the responsible emitting parties through national reimbursement laws. In this regard, the EU has come up with a directive, which is according to EU definition *a legislative act that establishes goals that EU countries must achieve*. Each country, however, is free to develop their own laws to achieve these goals (European Commission, 2023).

2.5.1 EU Directive

Article (32) states that the entity defined in article (31) as the “Shipping Company” not in all cases will be the entity in control over the vessel’s level of emissions. An example of this is if under a contractual agreement, another entity other than the shipping company is responsible for purchasing fuel or making operational decisions that affect the overall greenhouse gas emissions of the ship. This might pose a challenge as the amount of emission from the ship would be uncertain at the time the contract is negotiated, thus the shipping company would not be able to know how much the “other” entity would have to pay.

As the article (31) determines compliance responsibility, it subsequently imposes a significant cost for shipping companies, which means that the EU and Member States must facilitate for the cost to be transmitted and distributed so that shipping companies can continue to operate sustainably. A possible solution is that the cost is paid by the party responsible for the emissions, in accordance with the polluter pays principle. This principle is enacted to ensure that the entity accountable for pollution is also paying for the associated environmental damage. Such a principle is endorsed in the aforementioned article (32), where the EU explains that incentives to implement emission reduction measures only achieve improvements if the polluter pays principle is functioning. Shipping companies should be able to pass the carbon costs to the entity responsible for the emissions, such as entities chartering the ship to transport goods. EU/EEA member states should ensure through the

correct measures that the shipping company is entitled to reimbursement if such costs arise on account of other parties. Such facilitation may assist a shipping company in passing the cost to the charterer through a contractual agreement if the charterer is responsible for emissions that result in the surrender of allowances. Actions by the charterer increasing emission costs can for instance be through determining carried cargo, speed and routing of the ship. Faster speed, deviation from optimised route, alternative ports or cargo specifics as temperature may all affect emissions in the scope of EU ETS. The shipping company is still responsible for EU ETS compliance but may be entitled to reimbursement (2023/959, 2023).

EU ETS allowance costs may be significant, with smaller companies being especially vulnerable. Transferring expenses could be through contractual agreements, but to reduce administrative costs, member states should in national law provide for statutory entitlement of reimbursement. As this is under national law, Article (32) states that all member states must ensure such entitlement of reimbursement to safeguard undistorted competition by preventing circumvention through a choice of law clause (2023/959, 2023).

2.5.2 Sea Cargo Charter

The Sea Cargo Charter (SCC) is a framework that provides a global baseline to assess and disclose whether chartering activities are in line with adopted climate goals. The framework is applicable for all charterers and creates a standard for transparently reporting carbon emissions from chartering activities and promotes a reduction in greenhouse gas emission in accordance with the International Maritime Organization's (IMO) decarbonisation targets (Tan, 2021). The principles of the SCC set an example as to how emissions from chemical parcelling operations by companies such as Odfjell and Utkilen can be assigned to the different charterers with cargo onboard. The allocation is contingent upon the specific quantity of cargo each charterer has on board during the different legs of the voyage. SCC provides guiding principles to allocate emissions, as exemplified in *Table 1*, *Table 2* and *Table 3*. As chemical tankers spend significant time in port, these emissions are included to ensure that all emissions from the voyage are assigned to customers. The emission factor is rounded to 3 tonnes CO₂ per tonne of fuel, as regular fuels for chemical tankers such as MGO and VLSFO have different carbon emission factors slightly above 3. *Table 1* shows the cargo in tonnes for each charterer, and *Table 2* shows the cargo in percentages.

Table 1: Voyage with multiple customers. Source: Authors' own example based on principles from SCC (Sea Cargo Charter, 2023).

Freight amount per charterer (t)					
Location	Fuel (t) / CO ₂ (t)	Charterer 1	Charterer 2	Charterer 3	Charterer 4
Port A	50 / 150	0 → 1000	0 → 2000	0	0
At sea	100 / 300	1000	2000	0	0
Port B	25 / 75	1000 → 2000	2000 → 0	0 → 5000	0 → 1000
At sea	150 / 450	2000	0	5000	1000
Port C	75 / 225	2000 → 0	0	5000 → 0	1000 → 0

Table 2: The percentage of cargo for each customer. Source: Authors' own example based on principles from SCC (Sea Cargo Charter, 2023).

	Charterer 1	Charterer 2	Charterer 3	Charterer 4
Port A	33.3%	66.6%	0%	0%
At sea	33.3%	66.6%	0%	0%
Port B	20.0%	20.0%	50.0%	10.0%
At sea	25.0%	0%	62.5%	12.5%
Port C	25.0%	0%	62.5%	12.5%

Based on the percentage of cargo for each part of the voyage, the CO₂ emissions are prorated between each charterer, as shown in *Table 3*. This makes it possible to calculate the number of allowances needed to cover each of the charterer's emissions.

Table 3: Tonnes of CO₂ based on percentage of cargo. Source: Authors' own example based on principles from SCC (Sea Cargo Charter, 2023).

t CO ₂	Charterer 1	Charterer 2	Charterer 3	Charterer 4
Port A	50.0	100.0	0	0
At sea	100.0	200.0	0	0
Port B	15.0	15.0	37.5	7.5
At sea	112.5	0	281.3	56.3
Port C	56.3	0	140.6	28.1
Total	333.8	315.0	459.4	91.9

2.5.3 ETS Contract Clause

A contract clause for Time Charter Parties has been proposed by the Baltic and International Maritime Council (BIMCO), containing standard terms for settling transactions affecting allowances. This clause requires charterer and shipowner to cooperate in the exchange of relevant data to facilitate compliance and transparency about the number of allowances each vessel needs to offset emissions. Data such as reported cargo sampling, bunkering and bunker surveys must be verified, ensuring total transparency and a solid basis as guidance to commercial obligations. The clause intends to function as a protection for shipowners from emission consequences sustained by charterers operations (BIMCO, 2023). Odfjell's Annual report from 2022 stated that Odfjell intends to pass the EU ETS costs to customers on a voyage basis in accordance with SCC principles. These costs are calculated by multiplying the CO₂ emission tonnes from each charterer's parcels with the emission allowance price at discharge time. Charterers are informed of emissions related to their cargo already from the year 2022, as Odfjell reports emissions per cargo to all customers. Odfjell has started the work of implementing an ETS-clause in charter parties and contracts of affreightment (Odfjell SE, 2023).

2.6 Conclusion

This chapter has presented general literature about the EU ETS and its mechanisms, and the system from a legal and economic perspective. The EU ETS stands as one of the world's largest and most comprehensive carbon markets. Since the establishment of the system the different phases have led to efforts to reduce GHG emissions in a cost-effective manner. The inclusion of the shipping industry in the EU ETS raises concerns primarily due to the anticipated cost implications. The literature review indicates that the inclusion will result in increased costs for the industry by €10 billion annually and therefore increasing fuel costs by nearly 50%. Thus, a variety of approaches of how to handle the costs may be considered within each company. As final implications of the EU ETS on shipping companies cannot be known until the directive is enforced, the best strategies are still subject to conjecture.

Chapter Three: Methodology

The purpose of this chapter is to introduce the research methodology and methods employed in this qualitative study regarding how chemical tanker shipping companies will transfer the EU ETS costs legally and practically to their customers. This chapter will discuss in detail the different stages of developing the methodology of this study, which includes the foundation of the selected research approach, the chosen method of research, how data was gathered and a presentation of the participants. The chapter closes with a discussion on the quality of the research where both validity and reliability will be evaluated.

3.1 Research Approach

Social science generally distinguishes between a qualitative approach, a quantitative approach and mixed methods when conducting research. Within the two main approaches there are several different quantitative and qualitative methods. When deciding which approach to utilise, it is important to have in mind what the researcher wants to obtain (Larsen, 2020). A quantitative approach aims to generalise findings from a sample of the target population by quantifying data, thus the data is usually in the form of numbers. Quantitative research is often based on deductive reasoning, which means that the researcher already has a theory or hypothesis and proceeds to test it through observations and data collection (Tjora, 2021).

Unlike the quantitative approach, which is all about cold, hard facts, the qualitative approach is designed to create a thorough and detailed description of your observations as a researcher. The qualitative method allows for data contextualisation and interpretation. Furthermore, this research strategy is subjective and requires a smaller sample size of carefully selected respondents (Bouchrika, 2023). Compared to quantitative research that is often based on deductive reasoning, qualitative research generally has an inductive inference. This means there is no theory to test, and the researcher has little insight into the outcome of the sample population. The researcher collects the data about a topic of interest and looks for patterns where the aim is to develop a theory to explain patterns found in the data (Tjora, 2021). An inductive inference goes from specific observations regarding individual events to wider generalisations and theories (Soierman, 2010).

A qualitative research approach was chosen for this study based on the presumption of there being a limited group of people in each shipping company who possesses a substantial amount of knowledge of the EU ETS. It was important that the participants were familiar with the directive and had formed some ideas about how the costs will be transferred. A quantitative approach could also be possible where we send out a survey with prepared answer options to all employees in the two chemical tanker shipping companies in which we have our internships. However, the data from the survey would not be of great value in the case of answering the problem statement of this study. This is part of the reason we decided against using a mixed methods approach as it would require sufficient resources and skills to gather and analyse both quantitative and qualitative data. In addition, having a mixed method approach would also require more time than if we only use one approach. Based on this, a qualitative research approach was chosen for this study for the sake of producing rich and high-quality process data.

3.2 Research Method – Semi-structured interview

The method used when conducting research can be viewed as a tool for acquiring new information to answer previously unanswered questions, thus contributing to the body of knowledge in a discipline. The research method is about how we gather, organise, and analyse the data, thus affecting the end result (Larsen, 2020). The chosen method for collecting data for this study is in-depth interviews as this method provides us with a large amount of data as well as a deeper understanding of the topic.

There are several interview styles that can be used within in-depth interviews. Structured interviews are characterised by questions being asked in a prearranged sequence and do not accommodate for any arising questions. Unstructured interviews are the opposite as they are typically more free-flowing. However, in this study we will use a semi-structured interview style as the chosen method for collecting data. Semi-structured interviews are an in-between interview style of the structured interviews and unstructured interviews as they are partially structured. These interviews are characterised by their flexibility in terms of the order in which the questions are addressed, as well as their open-ended nature which allows for follow-up questions to clarify or gain a better grasp of the topic of study (Larsen, 2020). Thus, a semi-structured interview style was seen as the best option for creating an engaging

and relaxing dialogue as it is not too formal and rigid while still allowing for comparisons between the respondents.

The interviews were conducted with several participants from both shipping companies, Utkilen and Odfjell. The interview guide was sent to Sikt, which is the Norwegian Agency for Shared Services in Education and Research for approval prior to conducting the interviews. The participants were either asked in person or via email whether they wanted to be interviewed or not and had to sign a consent form which was sent a couple of days prior to the interview. A total of 14 open-ended questions were asked.

The interviews were primarily conducted face-to-face at the participants' workplace, as this was the preferred method with respect to creating a more natural and relaxed setting and to avoid potential technical issues if we were to interview through software such as teams or zoom. Meeting physically also allows the interviewer to interpret the respondents' body language which is also an important part of qualitative research. Although the language of communication in shipping is English, the questions were posed in Norwegian as it is the participants' native tongue. The interviews were audio recorded with permission from the participants in order to easily transcribe the interviews later.

3.3 Study Participants

The main rule in qualitative interviews when selecting participants is that the researcher selects them based on being able to answer the questions with a degree of reflection concerning the relevant topic. This means that the participants are carefully selected and not at random like in a quantitative survey (Tjora, 2021). In this study, a total of 8 people from Odfjell and Utkilen were interviewed. The participants from each company held different job positions, but to ensure anonymity, the specific job position titles are changed to the different departments they work in, as shown in *Table 4* below.

Table 4: Study Participants from Odfjell and Utkilen

Participant	Shipping Company	Department
Participant 1	Odfjell	Analytics
Participant 2	Odfjell	Finance
Participant 3	Odfjell	Administration
Participant 4	Odfjell	Operations
Participant 5	Utkilen	Finance
Participant 6	Utkilen	Technical
Participant 7	Utkilen	Operations
Participant 8	Utkilen	Chartering

These participants were selected as they possess an extensive amount of knowledge about the EU ETS in addition to representing different departments of the companies, thus providing expertise in each of their fields. Furthermore, the participants actively participate in specific projects and planning related to the system's implementation. In addition to representing different departments, some of the participants had years of experience at seniority levels such as senior, executive and top management.

3.4 Quality of Research

Validity and reliability are essential criteria for assessing the research's quality, and it is something that the researcher must work with and evaluate throughout the entire research process (Larsen, 2020). Validity concerns whether we have been successful in gathering the desired data, while reliability is concerned with whether we can trust the gathered information (Tjora, 2021).

3.4.1 Validity

Validity refers to the accuracy of a measure, whether the gathered data truly represent what they are intended to measure. It is further stated that the most important source of high validity is that the research is conducted within the framework of professionalism and is anchored in other relevant research (Tjora, 2021). Because the participants we interviewed provided a large portion of the information for this study, it was critical that they met specific requirements to ensure high validity. There was already a natural limitation on who our targeted group for the interviews would be as both have internships at Utkilen and Odfjell,

two distinct tanker shipping companies. In addition, we only chose respondents who we thought would have the most knowledge about the current topic to provide us with valuable data. Something that should be taken in consideration is that since shipping will not be implemented in EU ETS until January 1st, 2024, the respondents might not possess enough knowledge about the topic, which may affect the validity of the research. However, this is an issue that concerns all shipping companies.

Another aspect that should be taken into consideration is that the answers varied between the participants as they each held different job positions as well as having different professional backgrounds. However, this can also be seen as a strength as each respondent covers areas where the other does not. They each contribute with their particular field of knowledge which in total covers a lot of the overall topic. Tjora (2021) further states that we can ensure high validity through clarifying how we conduct the research from the questions we ask. As earlier mentioned, the questions were posed in an open-ended manner that allowed the participants to answer minimising the risk of being influenced by the interviewer asking the questions. Each interview was conducted with both interviewers present, which increases both the validity and reliability of the findings (Fifić & Gigerenzer , 2014).

3.4.2 Reliability

Reliability concerns whether we can trust the gathered information, it evaluates how well the measurement tool produces consistent results when repeated measurements are taken (Larsen, 2020). Ensuring high reliability in qualitative research can prove more challenging compared to validity. According to Larsen (2020) there is an increased risk of the participants being influenced by the situation and the interviewer which can affect how the participants choose to answer the questions, thus affecting the quality of the data. Larsen (2020) therefore emphasises the importance of a systematic data gathering process. As earlier stated, the interviews were primarily conducted face-to-face in the workplace of the participants. The interview setting ensured that a comfortable environment was created for each participant. Something that also should be addressed is the relationship between the interviewer and the participants. In most cases of qualitative interviews, there is a power relationship between the interviewer and the interview participant, where usually the interviewer is the one who leads the conversation and sets the agenda while the participant has some control over to

which extent some topics are discussed. Openness from the participant can prove to be challenging when discussing personal experiences or opinions, especially when the interviewer does not reciprocate by revealing anything about themselves. The topic of this study does not focus on individual experience but tries to get an overview based on how two chemical tanker shipping companies relate to the EU ETS. In our case, it was important to inform the participants via consent form which they had to sign prior to the interview. The participants were also informed about the aim of the study, that the study was written by two students working as interns in two different companies, that the thesis would be read by someone from each company before publishing, and that the participants were free to decline to answer a question if they felt that it would reveal confidential information. In terms of recruiting, it should be stated that the kind of relation the interviewer has with the participant also affects the reliability of the research. In a smaller shipping company such as Utkilen, it is more likely that the interviewer to some extent already knows the participant. In the case of a much bigger shipping company, such as Odfjell, there is an increased chance of interviewing someone who neither party knows.

According to Tjora (2021), the qualitative data gathered is often presented as quotations from interviews and extracts made from observation notes to give the reader an insight in the actual circumstances in addition to the researcher's interpretation. Furthermore, it is also stated that vulnerable areas in qualitative research include target group selection, the presentation of interview quotations or extracts made from observation, where the issue becomes what this represents in relation to extracts not presented (p. 263). When it comes to how data material from interview is processed and prepared for interpretation, there is a lot of effort involved because the data from the interviews must be transcribed before it can be analysed. This results in a large amount of data, so it is critical that the researcher is aware of how to choose which data to present. Research transparency is therefore essential where the researcher tries to identify a common pattern from interview transcriptions, but also be transparent about potential deviations. Another thing which is important to note is that since the interviews are conducted in Norwegian, the transcriptions will be in Norwegian and therefore must be translated into English in Chapter Four: Findings. The challenge lies in preserving the meaning of the interview transcriptions.

Chapter Four: Presentation of Findings

This chapter is divided into two parts, where Part One (4.1) will introduce the two companies where the interviews have been conducted, as well as an estimate of their CO₂ emissions from 2022. Part Two (4.2 - 4.6) sets out to introduce and describe the results of the semi-structured interviews. The data collected will be presented in the following four sections based on the questions asked: 4.2 *Impact of the EU ETS*, 4.3 *Readiness*, 4.4 *Concerns*, 4.5 *Cost Transfer and 4.6 Additional Findings*. The chapter will close with a summary of the findings. As the participants are anonymous, they will be referred to as *Participant 1* to *Participant 8*.

4.1 About Odfjell & Utkilen

Odfjell SE is a fully integrated organisation with complete chartering, operations, and marine services, with its headquarters in Bergen. The first Odfjell ship owning company was founded in 1914. After more than a century of development, Odfjell now operates 69 chemical tankers, ranging from 16,000 to 51,000 dwt. Odfjell operates a fleet of large vessels as they are focusing on worldwide deep-sea trade. Odfjell keeps the number of voyages under contract between 45% - 55%, with the rest being spot voyages (Odfjell, 2023).

Utkilen AS is a fully integrated chemical tanker shipping company with headquarters in Bergen. The company was founded in 1967 and currently owns and operates 16 chemical tankers ranging in size from 6,000 to 17,000 dwt. Utkilen is a major seaborne transporter of chemicals and other bulk liquid cargoes in Northern Europe. The company operates in-house, which means that they have functions for chartering, operations, ship management and crewing. Around 65% - 70% of the voyages are under contract, while the remaining 30% - 35% are spot voyages. (Utkilen AS, 2023).

Both Odfjell and Utkilen operate in the Chemical Tanker Segment. This is a segment in the shipping industry where vessels transport a wide range of hazardous and non-hazardous liquid chemicals in bulk. This study includes vessels ranging from around 6,000 dwt to 51,000 dwt and therefore covers both short-sea and deep-sea.

As mentioned in Chapter Two, the chemical tanker segment is only responsible for a small percentage of total emissions. However, this can be explained by fewer vessels operating in

the segment. To see the significance of the allowance cost we must examine each company individually to account for the size of the fleet and where they operate geographically.

4.1.1 EU ETS Emissions & Costs for Odfjell

Odfjell had 45 vessels operating in the EU in 2022. The rest of the fleet operated exclusively outside of the EU in 2022. This resulted in emissions of 277,467 tonnes of CO₂ in the EU, mainly during voyages to and from EU, as shown in *Figure 3*. When the EU ETS is fully implemented, the total cost of allowances will be €16.8 million annually based on emissions from 2022 and with an allowance price of €100, as shown in *Figure 3*.

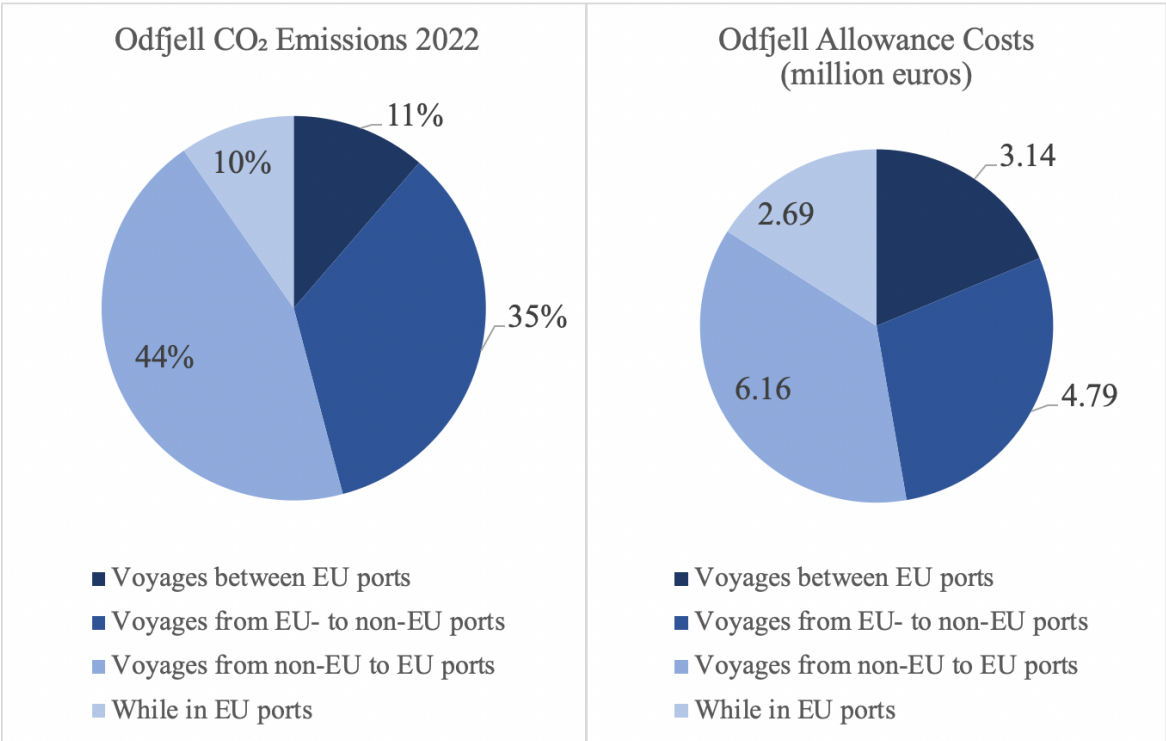


Figure 3: CO₂ emissions from Odfjell in 2022 & allowance costs based on 2022 emissions.
Source: Authors’ own calculations based on data from Thetis-MRV (EMSA, 2023).

As Odfjell is a deep-sea shipping company, the fleet also produces significant emissions outside of the EU. Worldwide, Odfjell vessels accumulated a grand total of 1.28 million metric tonnes CO₂ emissions during 2022 alone, even with a reduction of 14% from 2021 (Odfjell SE, 2023).

4.1.2 EU ETS Emissions & Costs for Utkilen

Utkilen had 13 vessels above 5000 GT which operated in the EU in 2022. As Utkilen mainly operates in the EU, 80% of emissions were during voyages between two EU ports. In total, the fleet accumulated 129,249 tonnes of CO₂ emissions in the EU, as shown in *Figure 4*. These emissions will if continued result in annual allowance costs of €12.2 million, if allowance price stays at an even €100, as shown in *Figure 4*.

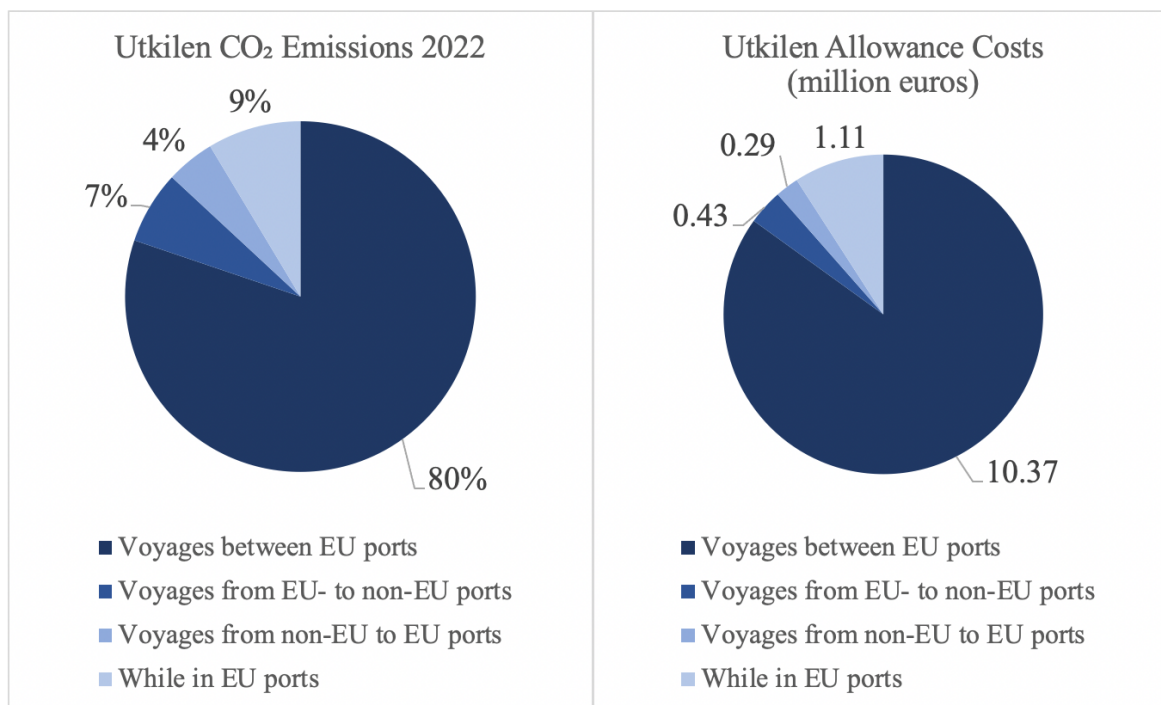


Figure 4: CO₂ emissions from Utkilen in 2022 & allowance costs based on 2022 emissions.
Source: Authors' own calculations based on data from Thetis-MRV (EMSA, 2023).

A shipping company primarily operating in Europe will experience larger costs relative to their operational fleet. This is because voyages within the EU incur allowances for 100% of emissions, while voyages to and from the EU only require allowances for 50% of emissions. To show an example of this, CO₂ emissions in the EU and cost of allowances to cover the emissions are illustrated in *Figure 5*, for the 45 Odfjell vessels and the 13 Utkilen vessels above 5000 GT operating in the EU.

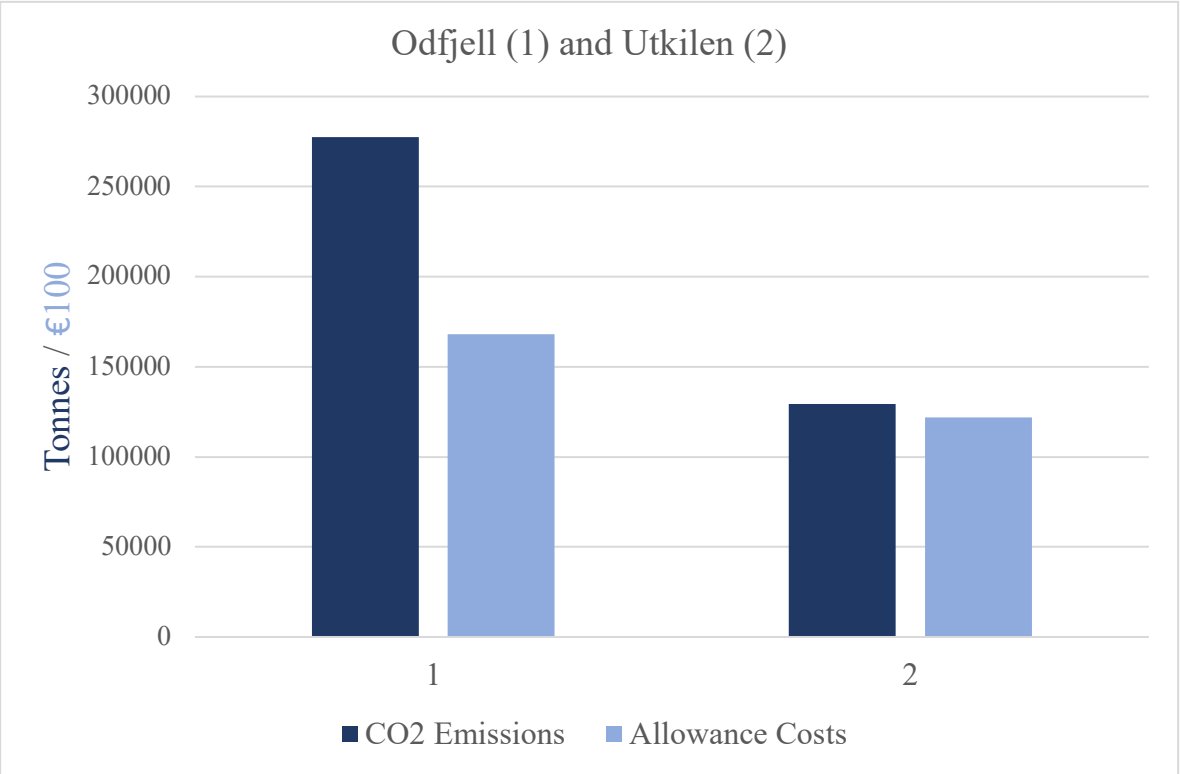


Figure 5: Emissions and Costs for Odfjell and Utkilen. Source: Authors’ own calculations based on data from Thetis-MRV (EMSA, 2023).

Based on the estimated emissions above, we can see that the associated allowance cost is significant for both Odfjell and Utkilen. Consequently, in light of this, interviews were conducted within the two companies to explore their readiness and concerns regarding the situation, as well as potential strategies for cost allocation and pricing. Moreover, we delve into the legal aspects to address the dynamics of emissions and costs for the shipping industry.

4.2 Impact of the EU ETS

Both companies share the opinion that the EU ETS will significantly affect the shipping industry, primarily through additional administrative work for the company in terms of monitoring and reporting greenhouse gas emissions. The optimistic outlook is that it will not lead to an additional or a significant cost for the companies as it will be transferred over to their customers based on the polluter pays principle.

“No, I think that the industry perceives it as something really complicated or complicating. It could have been executed in a much simpler way, it seems very bureaucratic from a shipping point of view. So, it’s going to entail a lot of additional work, it’s still unclear or there are still details that are unclear, and it’s only a couple of months before we start.”

– Participant 3, Odfjell

One participant stated that the EU ETS will also lead to a stricter emission reporting:

“They will get new systems, a stricter reporting, there are more requirements for emissions to be more verified. Until now, we can tell our customers that we have consumed so much fuel or that we have emitted so and so much fuel right, but right now it is not verified, so for example we can get a system that requires that the consumed or emitted fuel is verified by a third-party class. For the shipping company, it will lead to extra work in terms of following up, but it should not have much to say for our financial situation because we as a shipping company want the customers to pay. Polluter pays, and the payment requirement will go to them, and they again must bring the additional cost to the consumer, that way they can increase the price on what they sell right. So, financially speaking, we do not want it to affect us.”

– Participant 6, Utkilen

One participant however, stood out by mentioning that the EU ETS may affect the competitiveness of European industry:

“The concerns, as far as I believe is that it may inflict additional expenses on European industry, which may lead to reduced production, that the European industry becomes less

competitive compared to industry in other parts of the world. So, this is not positive. If there were a tax on a global basis, it would be more fair.”

– Participant 5, Utkilen

Participant 5 also reflected on how the EU ETS will affect the different shipping segments:

“I presume that it will be relatively similar for different segments. Perhaps some of the areas of shipping that have newer tonnage will potentially fare better than those with older tonnage. Certain types of tonnage have a shorter lifespan than others, chemical tanker vessels for example are known to have a long lifespan. At the same time, we see that some of the older vessels have a carbon footprint compared to the newer vessels. There is no one-size-fits-all solution.”

– Participant 5, Utkilen

When asked about the impact of EU ETS, all participants agreed that there will be no operational changes due to the implementation of the system:

“(…) not directly as a result of EU ETS. We have however considered operational changes based on CII [Carbon Intensity Indicator] (…) I believe that the cost of the CO₂ is so small that all operational adjustments probably will be more expensive than to just sail the most efficient route.”

– Participant 1, Odfjell

“We have not considered operational changes due to the EU ETS, but we continuously work with energy efficiency and optimisation based on 2030 and 2050 climate goals by reducing our carbon footprints by 50% by 2030 (compared to baseline year 2008) which is our main goal. The EU ETS is not the main reason for energy efficiency measures, it’s a bigger picture than just the EU ETS.”

– Participant 7, Utkilen

4.3 Readiness

The overall impression, given the circumstances of not fully well knowing the outcome of the inclusion of shipping in the EU ETS, was that the participants from both companies felt well prepared and they saw it as advantageous that they had begun addressing the issue ahead of other shipping companies. The answers vary between the participants when it comes to how each company had prepared themselves. Odfjell monitors and allocates emissions in accordance with the SCC framework:

“In some areas I believe that we have prepared ourselves well. In 2021 we adopted a framework (...) We use the Sea Cargo Charter Framework (...) one of the main things are that one monitors and allocates the emissions of a vessel and it will be allocated to those who charter the vessel, those who rent a place on board, those who pay for the freight, basically our customers. We started doing this in 2021, worked quite a lot with it, created an overview where we managed to get total consumption and divide it among the different cargoes we had on board, and calculate how much CO₂ is accrued by the different cargo owners. So, I feel we were early in reporting emissions to the customers, and it has turned out to have been a very good first step towards EU ETS (...) We have created an overview on our end so that we have control on our business agreements and their pertinent emissions. Therefore, as soon EU ETS became a reality, became legislation, we could quite easily make an overview of numbers of allowances we would have to buy if it (EU ETS) became applicable in 2021 or 2020.”

– Participant 4, Odfjell

Utkilen also stated that they have an overview over the emissions and are already reporting to their customers:

“We have been reviewing our fleet and have looked at the total annual emissions from previous years, to be fully aware of how much we emit and can estimate how much emissions we can expect in the coming years. We have calculated what the cost will be based on allowance price. So that’s what we have done, and we have started to report the emissions from the voyages to our customers.”

– Participant 6, Utkilen

All participants shared a consensus of having an open book philosophy regarding transparency of the emissions costs:

“We believe that the more transparent we are, the easier it is to improve the dialogue with the customers, and it will be easier for them to accept that this is their expense and not ours. We believe in full transparency. The main challenge is that the emission data we want to provide is not known until the end of a voyage, however most of the dialogue with our customers happen before the start of a voyage while booking cargo.”

– Participant 2, Odfjell

4.4 Concerns

The major concerns among the participants regarding shipping being included in the EU ETS revolve around the extra administrative work which will be both time and resource consuming:

“We don’t really have any major concerns, it’s just something that we will have to deal with. There’s going to be additional administrative work. That’s what it is. It’s going to be an expense for us anyway regardless of how you look at it, so it’s just going to be one more thing that we have to deal with. Right now, that might be our biggest concern. We are not concerned about how this is going to be, that we will be able to meet this requirement, but it’s going to be an extra cost.”

– Participant 3, Odfjell

In addition, another common denominator is the concern of not getting the customers on board with shipping companies transferring the costs to them, leaving the companies with the cost. The participants were fully aware that the shipping company will have to be economically responsible for the costs associated with the administrative work, however the hope is that the direct cost of the allowances required will be transferred to the customers:

“I think that the biggest challenge will be to get the customers on board with it. That’s probably the greatest challenge we face because we as a company are obligated to pay and

to be compliant anyways. So, it's the expenditure item if I look at it purely financially. But in a way it's going to affect us mostly as a company since it's unlikely that we will change that much operationally. It's mostly financial, we know it's going to be a major expenditure, so we must work with how to cover this at the other end. That's going to be the biggest challenge for us as a company, that's probably what's going to be the focus. And there are going to be other elements, it's possible that we will take measures to try and minimise the quantity of CO₂ allowances we have to buy, but we already do that in fact in many other contexts. I don't think it's going to be relevant to install sails on the vessels to minimise the ETS cost, we have so many other projects and measuring parameters that are more controllable for what we do with our vessels or which vessels we want. So, I think mostly it's going to be the financial and the contractual considerations around it."

– Participant 4, Odfjell

One participant from Utkilen also mentioned concerns regarding whether Norway manages to have a regulatory system in place before the start date.

"One of the concerns in the short term is if Norway does not have their regulatory framework in place before the new year, there are some rules that require you to trade quotas through another country, and it's the country where you have the most port visits in the year I believe. For us, we could quickly end up in the Netherlands or something like that. And then we run out of time (...) But that's in the short term. In the long term I'm maybe worried about the extra work of monitoring this, verifying emissions. It's going to require time and resources to do so."

– Participant 6, Utkilen

Participants from both Odfjell and Utkilen considered the possibility that the EU ETS will affect the profitability in the short term but believe that it will not affect the profitability in the long term as Utkilen stated that:

"(...) in the long term both we and our customers will reduce our expenses because we are investing in more environmentally friendly vessels. However, it will probably have a negative

impact on profitability in the short term. Of course, we seek to transfer as much as possible, if not all the costs to our customers.”

– Participant 5, Utkilen

Odfjell stated that:

“(…) the impact on the profitability depends on how well we are able to transfer these costs. In the short term there is a risk that Odfjell will end up covering these costs. In the long term, the market will adjust.”

– Participant 2, Odfjell

4.5 Cost Transfer

All participants across both companies shared a common perspective regarding the distribution of EU ETS costs. They emphasised that their customers should bear the responsibility for the emissions associated with their cargo. Participants from both companies also share the opinion that the primary objective of the EU ETS is to enforce the fundamental principle that the final consumers cover the cost of emissions stemming from the products they purchase. This arrangement must therefore be funnelled through the charterers to ensure that the cost is passed down. One participant from Odfjell provided this explanation when asked about who the cost should be transferred to:

“It [the cost] should be transferred to the final consumer ultimately. So, it must go over to our customers. That is, at least the way we perceive ETS, the idea is that if you involve the customer, then the customer will take greater responsibility for their emissions and more actively take part in the planning to make shipping more efficient.”

– Participant 2, Odfjell

Utkilen shared the same view:

“It’s us as consumers, but through charterers, meaning the ones we transport cargo for (…). Our impression is that the purpose of the new regulations in Europe is that it’s the final consumer who should pay for the emissions they inflict upon the environment.”

– Participant 5, Utkilen

4.5.1 Invoicing Process

The overall impression is that to transfer the cost in a way that the customer will accept, shipping companies must enhance transparency and provide precise measurements about the environmental impact from each customers' cargo. They intend to break down emissions along with corresponding costs by showcasing the number of allowances purchased and their associated costs. This is planned to be incorporated into the invoicing process. Participants from Utkilen answered that they are looking at offering various payment options, as some of their larger industrial customers already have been part of the EU ETS for years:

“We have many major industrial customers in Europe you know, so as far as we're concerned it is quite easy as many of the customers have been in the EU ETS for a long time. They are already purchasing allowances and would like to pay in allowances.”

– Participant 6, Utkilen

“There will probably be customers, especially major industrial customers that already have an allowance system implemented, that will be more interested in transferring allowances to us, instead of paying the price of purchasing an allowance. They have probably gotten it at a cheaper price earlier.”

– Participant 7, Utkilen

One participant from Odfjell stated they had discussed the possibility of customers paying for emissions in allowances:

“We have talked a little bit about this without having made a decision. It is absolutely an opportunity. On the invoice we will inform about how many allowances the emissions require and how much it amounts to in dollars.”

– Participant 4, Odfjell

In terms of invoicing frequency, participant 7 explained how Utkilen are flexible but would prefer to invoice after each voyage as the emissions are known straight away:

“It will be up to each customer to decide how they want to do it. We are prepared to invoice after each voyage, we are also prepared to invoice on a monthly or quarterly basis, or even more seldom if that’s what they prefer. (...) ideally we will invoice after each voyage as we at the end of each voyage know what the consumption has been. (...) A final decision has not yet been made, we will wait for the feedback from the customers when the brokers start to discuss clauses and such. Ideally and hopefully, we will be able to invoice after each voyage as that is the best and easiest for us.”

– Participant 7, Utkilen

Participant 8 highlighted the difference between spot voyages and voyages under contract:

“(...) one must differentiate between voyages under contract and spot voyages. On the spot market it will be included in the freight rate. On contract relations there will be other mechanisms, there will be separate invoicing. I believe Utkilen will report actual emissions after each voyage, and one must find a practical solution for when the customer will be invoiced based on a given date which is agreed upon by the customer and the shipping company. It can for example be the same as with a demurrage invoice which is sent after the voyage.”

– Participant 8, Utkilen

4.5.2 Allocation of Costs

Participants from both companies explained that they have systems designed to measure emissions during a voyage and thereby accurately calculate emissions linked to each customers’ cargo. One participant explained that Odfjell for a while has measured all the emissions from each voyage:

“We have been working on this for two years. It’s really about having control over our data and what our exposure is, what will be our cost. It’s quite simple really because the ETS is built on MRV reporting. So, measuring our emissions in and out of the EU is nothing new. What’s new is that we will set a dollar amount behind the emissions, since we are an integrated shipping company, we will face other consequences than for example a ship

manager, shipowner or a broad commercial manager. We may have the advantage and disadvantage of being able to see the whole process.”

– Participant 2, Odfjell

As the EU ETS is directly linked to MRV, the reporting system already provides a comprehensive overview of emissions both into and out of the EU. One participant underscored the automation, as their systems are designed to automatically calculate the emissions attributable to each customer. This data forms the basis for generating an automatic report which essentially doubles as an invoice. When multiple customers are on the same voyage, all participants from Odfjell explained that the SCC will be used to prorate the cost to each customer based on the quantity of cargo each customer ships on each leg of the voyage:

“Our approach is to adhere to the Sea Cargo Charter which provides guidelines also within parcel-trading for how you should distribute emissions on board. So, we choose to follow this. Then we expect that our major customers and our most rational customers focusing on their own emissions will adhere to and hopefully accept this method of allocating emissions, however customers unfamiliar with Sea Cargo Charter are likely to have thoughts about this. Especially for the voyages where the vessel is not at maximum load capacity, or voyages with long ballast legs, or long voyages where customers only have cargo for parts of the voyage.”

– Participant 2, Odfjell

Both shipping companies share the view that the customers should bear the cost of the ballast journey to the port of loading cargo, as the emissions is the customers’ responsibility:

“Same applies [SCC guidelines] if the vessel sails in ballast, does not have any customers on board, emissions will be allocated to the first customer who loads cargo. This may seem unfair, however it’s in alignment with the framework that’s been developed by many of the big shipping companies worldwide.”

– Participant 4, Odfjell

However, *Participants 5 and 6* from Utkilen acknowledge that there may be exceptions where ballast-legs occur without planned cargo, when tactically positioning a vessel closer to specific regions. In these situations, the shipping company may need to cover the associated emission costs:

“One may end up in particular situations for example when anchoring after discharging and don’t find cargo for the vessel for a while. Then it’s a bit unclear who shall pay for the emissions. I believe it will be at our own expense. (...) if we for example discharge in Poland without booking new cargo, we might ballast to ARA in order to position ourselves closer to where the action is at.”

– Participant 6, Utkilen

“We will certainly find ourselves in specific situations where we have an open vessel where we will for instance ballast from the Baltic Sea to Skaw in Denmark in order to position ourselves for a new voyage, without yet reaching an agreement. I believe we will not necessarily be able to cover the whole ballast leg in such a case, and we might have to cover some of the cost of the ballast leg.”

– Participant 5, Utkilen

4.6 Additional Findings

Following the completion of the interview-process, additional information has been brought to light. At the time of the interviews, Odfjell stated that they plan to allocate emissions according to the Sea Cargo Charter framework. Representatives for Utkilen did not mention anything regarding this during the interviews. However, Utkilen has subsequently, following the completion of the interviews, presented a proposal for a clause concerning the EU ETS, which explains how the cost will be calculated and invoiced. The clause specifies that the SCC guidelines will be utilised in allocation of emission costs when sailing in ballast or laden. This clause will eventually be incorporated into their contract and sent to their customers.

Furthermore, additional information regarding the payment preference was commented by *Participant 6*, who stated that Utkilen prefers customers to pay in allowances as this will

minimise the workload and financial risk in regard to purchasing allowances. By letting customers purchase allowances, the customer will bear the responsibility for the administrative work and the risk of volatile allowance prices. *Participant 4* from Odfjell also elaborated on payment preferences after the interview. He explained how Odfjell would prefer their customers to pay in allowances but believed that the minority of customers would do so. He emphasised that Odfjell will be open to discussing payment preferences, and that it ultimately is up to the customer.

4.7 Summary of Findings

Based on the estimated emissions for Odfjell and Utkilen, we found that both fleets operate a considerable amount within the EU, which means that they will need to acquire a substantial number of allowances to cover their emissions. Based on the interviews, participants from both Odfjell and Utkilen share the opinion that the EU ETS will affect the shipping industry primarily through increased administrative tasks such as more frequent monitoring and reporting of GHG, which also was one of the concerns in terms of requiring time and resources.

Furthermore, both companies believe the long-term financial impact will be minimal as the costs are planned to be transferred to the customers based on the polluter pays principle, although some participants do foresee the possibility of short-term impact. In addition, the participants stated that they believe the implementation will not lead to operational changes. Both companies explained that they had started working with the EU ETS well ahead of the inclusion of shipping, thus they felt thoroughly prepared for when the directive comes into force. In addition, the importance of having an open book philosophy towards their customers regarding the emissions costs was emphasised. In terms of the EU ETS costs, Odfjell and Utkilen share a common perspective that their customers should bear the responsibility for the emissions associated with their cargo, essentially meaning that the final consumers cover the cost of emissions stemming from the products they purchase. Utkilen and Odfjell explained that prior to the EU ETS, they already had systems designed to measure emissions during a voyage, as emissions in the EU were being reported since the implementation of MRV. Moreover, they are looking at how to be flexible in terms of approaching the payment

process with each customer, whether emissions will be paid with allowances or other currency.

Utkilen and Odfjell have their own versions of the EU ETS clauses, adapted to how the companies operate, and are being incorporated into their Contracts of Affreightment and voyage charter parties. In cases where there are several customers on the same voyage, Odfjell explained that the SCC will be used to prorate the cost to each customer based on the quantity of cargo each customer ships on each leg of the voyage. Such a situation is usually not applicable for Utkilen as most of their voyages only have one customer at a time. In situations where a ballast journey should occur, both Odfjell and Utkilen agree that the main rule should be that the customers should be responsible for the cost of the ballast journey to the port of loading cargo. Some participants acknowledged that the shipping company might have to cover the expenses if ballast-legs occur without planned cargo when the vessel positions itself closer to specific regions.

Chapter Five: Discussion

The objective of this study is to explore the implications of the EU ETS for chemical tanker shipping companies and take a closer look at how shipping companies practically and legally can transfer the EU ETS costs to their customers. This chapter seeks to connect and discuss the major findings to the existing literature and research on EU ETS to determine whether this new data supports or contradicts the existing research. The chapter will conclude with a discussion of the limitations of the study, suggestions for future research and a summary.

5.1 Implications for the Shipping Industry

The estimated emissions from Odfjell and Utkilen presented in the previous chapter show that the majority of Odfjell's emissions are from voyages to and from the EU, while the majority of emissions from Utkilen come from voyages between EU ports. However, *Figure 5* which compared the emission in relation to the cost of allowances of the two companies, shows that the cost of purchasing allowances is significantly less in relation to the amount of CO₂ emissions Odfjell emit, while for Utkilen the cost of allowances in relation to the CO₂ they emit is much higher. This corresponds with what was previously mentioned in the literature review, where 100% of emissions from voyages and port calls within the EU/EEA will be subject to the EU ETS, while voyages to and from the EU/EEA will be limited to 50% of the emissions. Essentially, shipping companies trading in Europe will, at the start of the phase-in, be more affected by the cost of carbon emissions compared to shipping companies trading from or to EU ports until similar systems appear in other regions. As stated by Sheperd (2022) & Raanan (2023), nations such as Japan, China, the US and the UK are considering including shipping in similar emission trading systems, which means that shipping companies in addition to being compliant with the EU ETS, will also have to be compliant with other similar systems.

In the literature review, Martin et al., (2016, p. 8) stated that there is a risk for regulated firms of losing market shares to rival companies outside the EU. This might also pose a risk for the shipping industry as the EU ETS from 2024 will be the only operating emission trading system that includes the shipping industry. However, their research was conducted before the inclusion of shipping, and pertains to the EU ETS in general. In addition, the risk of losing market shares only exists as long as there are no similar systems in the regions outside the

EU. It therefore remains speculative whether carbon leakage will be present due to the inclusion of shipping in the EU ETS. As mentioned in the literature review, the European Commission has not included shipping on the list for industries with high-risk of relocating due to emission costs. Still, there are questions whether the system may result in a shift in transport within the continent to more land based such as road and railway transport or a reduction of trade and production on the continent in general. *Participant 5* reflected on this during the interview, when mentioning how the additional expenses may reduce production, and render European industry less competitive compared to other continents. He believes a global tax on emissions would be fairer for all industries.

Both companies agree that the EU ETS primarily will affect shipping through increased administrative work. This is understandable as the system requires stringent compliance reporting. Shipping companies must submit both verified emissions data as well as allowances to cover these emissions annually. This will increase workload compared to the previous MRV. The emission reporting will also be more comprehensive and frequent, as both Odfjell and Utkilen are planning on sending data and invoices to each individual customer for each voyage. As explained in the literature review there are annual requirements for compliance, however if the companies want to be reimbursed by customers, they must report associated emission costs to individual customers for each voyage. This continuous monitoring and reporting of emissions in addition to the fluctuation allowance price on the secondary market will impose additional workload to multiple departments of the companies. The participants foresee increased administrative responsibilities for both the operational team responsible for emission data and the financial team when allowances must be acquired.

Both companies foresee that the EU ETS might negatively affect financials in the short term, depending on how well they are able to transfer the costs. As earlier mentioned, the settlement of allowances to ensure compliance is not until September the following year. As *Participant 2* stated, this means that the shipping companies will not really know how well they transferred the cost until a year and a half later, so the profitability might be affected negatively in the short-term during the phase-in period. The participants also agreed that in the long-term, the profitability should not be affected, as the market will adjust, and the cost will be transferred. This seems to be supported by the literature regarding EU ETS in other

sectors. Dechezleprêtre, et al., (2018, p. 6) argued that the EU ETS contrary to expectations, increased the fixed assets and revenues for certain sectors. However, the arguments listed were linked to product quality and development of new products, thus it is not applicable for an industry that transports and does not produce. Dechezleprêtre, et al., (2018, p. 6) also explained that a possible explanation is that the EU ETS compelled businesses to invest in carbon-saving technologies. The participants in our research did not think that the system would be responsible for increased investment in such carbon-saving equipment as the cost is not significant enough. However, sustainability is prioritised within both companies. There are continuous efforts to reduce emissions in both Odfjell and Utkilen, to keep their fleets energy-efficient with low carbon intensity. According to the participants, investments in carbon-saving technologies are tied to other pressing climate goals such as net zero, with measures including CII. *Participant 1* stated that CII not only inspires investments in emission reduction technology but is also cause for discussions of potential operational changes. Participants from both companies implied that EU ETS alone is not the direct cause of changes in commercial strategy or operations. Both Odfjell and Utkilen are planning to continue operations as before despite the implementation of EU ETS. Both companies are continuously striving to optimise energy efficiency regardless, and any additional costs are intended to be transferred to customers. When considering economic impact that shipping potentially will experience, it is noteworthy to observe that other sectors previously included in the system such as aviation, did not experience negative consequences. However, as noted by Martin et al., (2016) and Giradet & Spinler, (2013, cited in Nava et al., 2018) this may be attributed to the simultaneous growth in the sector.

Participant 5 presumes that the impact will be similar for the different shipping segments. He highlights one aspect that might influence the effect and that is the age of the fleets and expected lifespans of the different types of vessels. As explained earlier, the current purview of the EU ETS encompasses all voyages within, as well as to and from the countries comprising the system, for cargo and passenger vessels exceeding 5000 GT. The regulatory framework therefore affects shipping companies across all segments operating within the EU, and there is reason to believe impact and strategies are uniformly applicable, regardless of segment or company size. It is however important to note that our research has been

conducted within chemical tanker companies, and the impact of EU ETS on other sectors therefore remains speculative.

5.2 Cost Transfer

We have now shed light on some of the implications of the EU ETS from the point of view of two chemical tanker shipping companies. In this section we will try to answer our research question on how shipping companies can transfer the EU ETS costs practically and legally to their customers.

The issue as to who should be the responsible part and EU ETS compliant is covered by the EU Directive 2023/959. As earlier mentioned, the responsibility falls on the shipping companies. However, the directive facilitates under article (32) that shipping companies under national law should be entitled to reimbursement for emission costs in line with the polluter pays principle. This is also how the participants from Odfjell and Utkilen interpret the directive. While it is not explicitly presented in the directive, all participants interpret that the objective of the system is to transfer the cost to the final consumer, ultimately to cause a change in customer behavior to reduce emissions. One of the major concerns expressed by Utkilen and Odfjell was the potential cost burden if they do not succeed in transferring the EU ETS cost to the customers. Based on the estimated EU ETS cost for Utkilen and Odfjell, it would be a significant expense, which is the reason the companies are working hard to prepare for the implementation of the system.

To figure out how to practically transfer the costs of the EU ETS to customers, both shipping companies seem to opt for a pragmatic approach as they plan to adhere to the guidelines of SCC when prorating the emissions. By doing so, the companies have a structured framework to guide them and ensure that the allocation is fair and acceptable for all parties, also including ballast legs of voyages. This is beneficial for both companies, however for Odfjell, the SCC is especially convenient as they often deal with multiple customers on board each voyage and will use the guidelines to prorate the emissions among the different customers on the same voyage. Given that the SCC provides a standardised approach which is a product of collaboration between major companies in the industry, the use of these principles is likely to promote reliability and trust between shipping company and customers. Such an approach

should not cause any legal concerns as it makes use of a common and global baseline for cost distribution.

An important aspect of cost transfer is legal risk mitigation by changing contracts to include clauses regarding EU ETS. Both Odfjell and Utkilen are currently doing this according to the participants. As explained in the literature review, BIMCO has proposed a clause for Time Charter Parties. Both shipping companies are aware of this, but are developing their own versions of such clauses, defined by each company to ensure that it is relevant for their specific business model. These clauses contain as mentioned elements from the SCC to prorate emission costs and will be incorporated into charter parties and contracts of affreightment. When differentiating between spot and contract voyages, it was mentioned under the interviews that both Utkilen and Odfjell will include the EU ETS cost in the freight rate when trading on the spot market, while there will be a separate post on the invoice for voyages under contract.

We also found that both Utkilen and Odfjell emphasised the importance of transparency when it came to customers accepting that shipping companies transfer the costs to them. As mentioned by *Participant 2*, he believed that transparency would positively affect the customer relations as they would be more open to accept the EU ETS cost. Shipping companies are already able to transparently provide accurate emissions data to their customers, as such data has been collected on voyages in the EU for the previous five years, as part of a MRV requirement. *Participant 2* however shared his concern over the challenge of being in dialogue with the customers prior to a voyage, as accurate emissions are not known until the end of a voyage. The emissions may deviate from projections due to unexpected circumstances. This concern is also mentioned in the directive, article (32) where the EU highlights the importance of the reimbursements for costs arising as the ultimate emissions are not known at the time the contract is negotiated (2023/959, 2023).

Participants from Utkilen and Odfjell explained how they are open to allow customers to pay for their emissions by transferring allowances, which is something large industrial customers may want to do. As mentioned in the literature review, other industries have been included in earlier phases of EU ETS, and therefore are likely to have routines and strategies for acquiring allowances. We found that both companies would prefer to receive payment in

allowances, as this common preference can be explained by some of the challenges we have discussed in this thesis. One element is what the participants believe is the main impact of the EU ETS for shipping companies, which is the additional administrative work. By letting the customers purchase allowances, some of the administrative work is avoided. However, the potentially costly element is the volatile allowance market. The inherent risk arises from the different times of purchasing allowances and invoice date to customers. The fluctuation in allowances prices can cause discrepancies between purchase price and the subsequent market value when the customer reimburses for their emissions. Even though Odfjell and Utkilen would prefer to receive allowances from customers, they recognise that most customers are unlikely to adopt this payment method and are ultimately leaving the decision to their customers.

5.3 Limitations and Future Research

It goes without saying that all research has its limitations. Study limitations can happen due to constraints on research design, the methodology employed or other external factors. This may subsequently impact the findings of the research. This section will therefore address the limitations of this study as well as suggestions for future research.

One of the limitations that should be addressed is the limited time we had to write this thesis as it was written during only four months while both students were working part time at Odfjell and Utkilen respectively. Generally, there is not yet much literature about shipping in the EU ETS, as the implementation is not until next year. There is also limited research conducted about the chemical tanker segment in this context, as research tends to focus on the overall shipping industry or larger segments. Another limitation is the number of participants, which in this case is eight, limited to employees in the two shipping companies where we had our internships.

Shipping companies are currently facing various challenges as the system will lead to new requirements to the shipping industry in addition to implementation being imminent. This is presently raising several questions amongst shipping companies as well as bringing potential issues to light. Furthermore, it is not unlikely that new issues will arise after the inclusion of

shipping into the EU ETS. This means that there is a current need and that there will be a need for new and updated information on this subject.

Further research should focus on investigating the EU ETS as the implementation unfolds, and how the system changes the shipping industry, also in the long term. It will be interesting to explore the actual implications of shipping being included in the EU ETS and how the cost transfer is being carried out between shipping companies and their customers, as well as the different strategies shipping companies choose to address the challenges that the system poses. Future research should also assess the validity of the claims by *Participant 5* and Martin et al. regarding carbon leakage and potential decrease in competitiveness for European industries. According to our participants, there are currently other climate goals and emission measures that influence operational changes and investment in emission reduction technologies. For the EU ETS to successfully reduce the environmental impact of the industry, it will be crucial to research how the system can be optimised to function as an incentive for shipping companies and their customers to reduce their emissions.

Chapter Six: Conclusion

This thesis discusses some of the implications of the EU ETS for chemical tanker shipping companies, and in particular how the EU ETS cost can be transferred to the customers. Based on the results from this research study, the following conclusions can be made:

1. The shipping companies anticipate impact and changes for the industry associated with the implementation of shipping in the EU ETS and recognise the substantial costs of emissions when operating within the EU.
2. The biggest concern regarding the inclusion of the shipping industry in the EU ETS is the additional administrative work it will take with reporting and verifying emissions.
3. For shipping companies operating within the EU, the cost of purchasing allowances will be higher in relation to their emissions, compared to shipping companies operating in and out of the EU (until other similar systems like the EU ETS are established).
4. Both shipping companies have made their own versions of EU ETS clauses, adapted to their own company where cost transfer will be based on the polluter pays principle.
5. The SCC guidelines will be used to prorate costs and will be incorporated into charter parties and contracts of affreightments for cases where the vessel sails in ballast or laden, or in cases of several customers on the same voyage. In situations where the ballast-legs occur without planned cargo and the vessel positions itself closer to specific regions, shipping companies understand that it is possible they must cover the expense themselves.
6. The shipping companies stated that it will be up to the customers as to how the EU ETS cost is paid, even though they expressed a preference for payment in carbon allowances as it would involve less work and risk for the shipping companies.
7. Both companies place great importance on being transparent with their customers, which will make it easier for the customers to accept the EU ETS costs shipping companies transfer to them.

These key findings were the result of in-depth interviews conducted within two chemical tanker shipping companies of different sizes and main areas of operation. While the insights

presented here as findings are through research and interviews specific to Odfjell and Utkilen, the implications of the EU ETS extend beyond these individual cases as the system is uniformly applicable to shipping in Europe. This suggests a broader relevance of the findings as they potentially can be relevant for more companies in the industry for both chemical tanker companies and shipping companies operating in other segments. Through our research we discovered that the chemical tanker shipping companies exhibit preparedness in addressing costs and possess detailed insights into potential effects of the EU ETS. Nevertheless, the actual impact of the system remains to be observed as its implementation approaches.

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Appendices

Appendix A – Interview Guide

Warm-up question:

- Can you introduce yourself by stating the company you work for and your current position?

Background:

- How do you so far perceive the consequences of the EU ETS for the shipping industry, especially for chemical tanker companies?
- How has your company prepared for the inclusion of shipping in the EU ETS?
- What are the company's major concerns regarding the inclusion of shipping in the EU ETS?

Operational changes and challenges related to the EU ETS and cost transfer:

- To whom will the cost of the EU ETS be transferred?
- How can the cost be transferred?
- How is the cost distributed when there are multiple customers on a voyage, and how is it calculated when the ship is not fully loaded?
- How is a voyage defined as started and ended?
- Has the company considered operational changes in response to the EU ETS, and if so, what are they?
- Are there specific challenges related to transparency when it comes to transferring EU ETS costs?
 - How has information about additional costs been communicated to customers?
- How will the EU ETS affect the company's profitability?

Legal considerations:

- Are you aware of any legal restrictions or guidelines that may impact the transfer of EU ETS costs to customers?
- How are charter parties and contracts being amended to include clauses related to EU ETS?

Closing questions:

- Is there anything you consider important in this context that we have not asked about?

Appendix B – Consent Form for Qualitative Interviews

Vil du delta i forskningsprosjektet *Bacheloroppgave 2023*?

Dette er et spørsmål til deg om å delta i et forskningsprosjekt hvor formålet er å kartlegge implikasjoner av EU ETS for kjemikalietankrederier, med fokus på overføring av kostnadene. I dette skrevet gir vi deg informasjon om målene for prosjektet og hva deltakelse vil innebære for deg.

Formål

Formålet med prosjektet er å få en dypere innsikt i implikasjonene for kjemikalietankrederier ved inkludering av shipping i EU ETS.

Problemstilling: Hvordan kan kjemikalietankrederier lovlig og praktisk overføre kostnaden av EU ETS til kundene?

Intervjuene skal bidra til data som bearbeides i en bacheloroppgave.

Hvem er ansvarlig for forskningsprosjektet?

Institutt for havromsoperasjoner ved NTNU i Ålesund er ansvarlig for prosjektet.

Hvorfor får du spørsmål om å delta?

Intervjuobjektene er fra rederiene hvor vi har praksisopphold og de er valgt basert på hvem vi tror sitter med mest kunnskap om temaet vi skriver om i bacheloroppgaven. Det blir gjennomført intervjuetriangulering der vi skal intervjuer folk med forskjellige stillingstitler.

Hva innebærer det for deg å delta?

Hvis du velger å delta vil vi gjennomføre et kvalitativt intervju. Det er snakk om 15-20 åpne spørsmål. Det tas lydopptak av intervjuet for å kunne bearbeide data i ettertid.

Det er frivillig å delta

Det er frivillig å delta i prosjektet. Hvis du velger å delta, kan du når som helst trekke samtykket tilbake uten å oppgi noen grunn. Alle dine personopplysninger vil da bli slettet. Det vil ikke ha noen negative konsekvenser for deg hvis du ikke vil delta eller senere velger å trekke deg.

Ditt personvern – hvordan vi oppbevarer og bruker dine opplysninger

Vi vil bare bruke opplysningene om deg til formålene vi har fortalt om i dette skrivet. Vi behandler opplysningene konfidensielt og i samsvar med personvernregelverket.

I oppgaven vil informantene anonymiseres.

Hva skjer med personopplysningene dine når forskningsprosjektet avsluttes?

Prosjektet vil etter planen avsluttes 15. desember 2023. Transkripsjoner og lydopptak av intervju brukes ikke etter prosjektet er avsluttet.

Hva gir oss rett til å behandle personopplysninger om deg?

Vi behandler opplysninger om deg basert på ditt samtykke.

På oppdrag fra NTNU har Sikt – Kunnskapssektorens tjenesteleverandør vurdert at behandlingen av personopplysninger i dette prosjektet er i samsvar med personvernregelverket.

Dine rettigheter

Så lenge du kan identifiseres i datamaterialet, har du rett til:

- innsyn i hvilke opplysninger vi behandler om deg, og å få utlevert en kopi av opplysningene
- å få rettet opplysninger om deg som er feil eller misvisende
- å få slettet personopplysninger om deg.
- å sende klage til Datatilsynet om behandlingen av dine personopplysninger

Hvis du har spørsmål til studien, eller ønsker å vite mer om eller benytte deg av dine rettigheter, ta kontakt med:

Institutt for havromsoperasjoner for NTNU i Ålesund ved Jan Emblemsvåg,
jan.emblemsvag@ntnu.no, [48264515](tel:48264515).

- Vårt personvernombud: Thomas Helgesen, thomas.helgesen@ntnu.no,
93079038

Hvis du har spørsmål knyttet til vurderingen som er gjort av personverntjenestene fra Sikt, kan du ta kontakt via:

- Epost: personverntjenester@sikt.no eller telefon: 73 98 40 40.

Med vennlig hilsen

Jan Emblemsvåg
(Forsker/veileder)

Tobias Natadal / Tuathla Honne
(Studenter)

Samtykkeerklæring

Jeg har mottatt og forstått informasjon om prosjektet *Bacheloroppgave 2023*, og har fått anledning til å stille spørsmål. Jeg samtykker til:

- å delta i dybdeintervju
- at data som kommer frem av intervjuet kan brukes til forskning

Jeg samtykker til at mine opplysninger behandles frem til prosjektet er avsluttet

(Signert av prosjektdeltaker, dato)



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