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EU ETS - Altera Infrastructure

How can a shuttle tanker company effectively adapt to and secure compliance with the EU ETS regulations?

Bachelor's thesis in Shipping Management

Supervisor: Jan Emblemsvåg

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Preface

Dear Reader,

This thesis was written during the final year of my bachelor's degree in Shipping Management at NTNU - Norwegian University of Science and Technology in Aalesund. The bachelor thesis was written while I was an intern in the shipping company Altera Infrastructure. The research question and the topic for the thesis was chosen by me as a researcher together with Altera, as the subject is highly relevant for the company. This has been the most challenging, but also the most exciting, academic thesis I have written and am grateful to Altera for the opportunity.

The thesis examines how Altera could effectively adapt and secure compliance with the new EU ETS regulations applying from the 1st of January 2024. The thesis will be answered based on interviews and observation from my intern period. The results given in the thesis are done based on the existing literature on the topic and the empirical data collected throughout the period. The fact that the regulations still have not come into effect have made the thesis both challenging and exciting at the same time.

I would like to thank Altera Infrastructure for the hospitality and the warm welcome I received from day one. I have received great support through the intern period, and I have been included in a way which made me feel like I was there as an employee. I would like to add a special thank you to my supervisor in Altera Infrastructure, Rein Harald Salte, for his guidance and support. I would also like to add that the support from NTNU, with Jan Emblemsvåg as supervisor, have been a great resource for me during this period as well.

Summary

This report has studied how a shuttle tanker company could adapt to and secure compliance with the new EU ETS regulations. ETS – Emissions Trading System is being implemented because of the European Union’s commitment to decarbonize the shipping industry.

ETS is chosen as the main topic of this thesis as it is highly relevant for the shipping industry. The regulation aims to reduce greenhouse gas emission by limiting the amount of ton CO₂ that could be emitted every year. Shipping companies will have to surrender allowances called EUAs. One EUA is equivalent to one ton of CO₂. Purchasing and surrendering allowances is costly and will have impact on contractual agreements as well as financial exposure. As part of the thesis, I have been working as an intern at Altera Infrastructure in Stavanger.

There is no doubt that the regulations lead to concerns which needs to be solved. I identified categories which raised concerns internally. These have been discussed with focus on the regulatory framework that have been presented by the European Commission. There are a lot of things that needs to be solved related to the implementation. The most urgent categories which has been identified to secure a smooth transition is related to emissions reporting, legal aspects, commercial aspect, and strategies on acquiring allowances.

I have been part of a reactive group who has tried to comprehend the most urgent challenges arising relating to the topic. The thesis discusses the various categories which has been identified and there is no doubt that it imposes great challenges. Altera is active and well prepared for the implementation of the regulations, but there are challenges that needs be solved.

Table of contents

- Preface..... 2**
- Summary 3**
- List of figures & Tables 6**
- Glossary 7**
- 1.0 Introduction..... 8**
 - 1.1 Purpose of the thesis 9
 - 1.2 Research Question..... 9
 - 1.3 Presentation of case company..... 10
- 2.0 Literature review..... 11**
 - 2.1 EU ETS..... 11
 - 2.2 Shipping Markets..... 15
 - 2.3 Tanker Shipping 16
 - 2.4 Sustainability & Decarbonization..... 17
- 3.0 Altera’s Charter Parties 18**
 - 3.1 Time Charter..... 18
 - 3.2 Spot 19
- 4.0 Research Methods..... 20**
 - 4.1 Case-Study 21
 - 4.2 Observation-Methods 22
 - 4.3 In-depth Interviews 22
 - 4.4 Structure 23
 - 4.5 Ethical considerations 24
 - 4.6 Selection of informants..... 24
 - 4.7 Validity & reliability 25
 - 4.8 COA - Contract of Affreightment..... 26
- 5.0 The results..... 28**
 - 5.1 Interpretation of the findings..... 28
 - 5.2 Main Findings..... 30
 - 5.2.1 Emissions Reporting 31
 - 5.2.2 Legal Regulations 32
 - 5.2.3 Commercial Aspects 35
 - 5.2.4 Strategies on Acquiring Quotas 37
- 6.0 Discussion..... 39**

6.1 Emissions Reporting.....	40
6.2 Legal Regulations.....	41
6.3 Commercial Aspects.....	42
6.4 Strategies on Acquiring Quotas.....	43
6.5 Validity & Reliability Related To The Main Findings	45
6.5.1 Critical Evaluation.....	45
6.5.2 Future Work	47
7.0 Conclusion	48
8.0 Bibliography.....	49
9.0 Pictures and figures:	52
9.0 Interview Guide.....	53
9.1 Introduction	53

List of figures & Tables

<i>Figure 1: The scope of EU ETS directive: EU ETS based on percentage of emissions on voyages. (DNV, 2023).</i>
<i>Figure 2: EU ETS introduction timeline. (DNV, 2023).</i>
<i>Figure 3: Types of crude oil tankers. (S&P Global, 2018).</i>
<i>Figure 4: Illustration of how a qualitative research process works (Neurorespract, 2020)</i>
<i>Figure 5: Trading Economics: EU Carbon permits. (Trading Economics, 2023).</i>
<i>Table 1: The most important findings generated through empirical coding</i>
<i>Table 2: The main findings from the analysis</i>

Glossary

EU ETS	European Emissions Trading Scheme
TC	Time Charter
COA	Contract of Affreightment
GT	Gross Tonnage
EUAs	EU Allowances
EC	The European Commission
DP	Dynamic Positioning
EEA	European Economic Area
DWT	Deadweight Tonnage
MRV	Monitoring, Reporting and Verification
ULCC	Ultra Large Crude Carrier
VLCC	Very Large Crude Carrier
Subject	In the thesis subjects are identified as the ones who have been interviewed.

1.0 Introduction

We face one of the biggest adjustments in history because of the environmental and climate challenges. Global shipping was in 2018, responsible for around 2.9% of global emissions caused by human activities (European Commission, u.d.). IMO, which is the International Maritime Organization, has developed a common ambition to reach net-zero greenhouse gas emissions from shipping by 2050 (IMO, u.d.). Altera Infrastructure is an international group which provides critical infrastructure assets to the offshore energy industry. Altera is separated into three business units, Altera Production, Altera Shuttle and Storage, and Ocean Towage and Offshore Services. In this thesis my focus will be on Altera's shuttle tankers, which are specialized vessels designed to transport crude oil. The thesis will take a deeper look at the business units' obligation to adapt to the European Commission's new regulations, EU ETS, which will apply from 1st of January 2024 (European Commission, u.d.).

EU ETS is an emissions trade and cap which defines the total amount of GHG that could be emitted by the operators that are covered by the system. The system aims to reduce greenhouse gas (GHG) emissions by limiting the amount of GHG emissions allowed for specific sectors, which in this case will be for the shipping industry. For each ton CO₂ emitted from a vessel operating within EU or EEA countries, shipping companies will have to surrender European allowances (EUAs) relative to the amount of tons CO₂ emitted. Altera operates ten shuttle tankers in the European market which means they will have to adapt and secure compliance to the new regulations from 1st of January 2024. Non-compliance of the regulations can lead to significant consequences for shipowners, failure to adhere could potentially lead to serious penalties and in worst case exclusion from trading within the European Union and the European Economic Area (European Commission, u.d.).

1.1 Purpose of the thesis

The purpose of the thesis is to highlight and examine a completely new regulation which will have a significant impact on the shipping industry, including Altera's shuttle tankers. Since the regulations are new and have not applied for the shipping industry yet, it would be interesting and necessary to look at the aspects of the implementation.

In Altera's case this is something which is completely new, and there are considerations that need to be made when planning for the implementation of EU ETS. The regulations lead to a lot of unanswered questions for ship owners. The biggest challenge is that the regulations will apply for all trade within EU and EEA even though you are registered outside the defined trading areas. By taking a deep dive into the regulatory framework the purpose is to identify which parts of the regulations that would cause the biggest challenges for Altera Infrastructure related to their shuttle tankers business.

The purpose of this thesis is to examine how Altera could adapt to and secure compliance of EU ETS on their shuttle tanker business. Since the regulations are new for the shipping industry there are no existing research studies which show the effects the new regulations will have. There are some articles which describe the impact on the shipping industry at a general level, but not specific for Altera as a company. The most efficient and suitable way to examine the subject is through a case-study of Altera, where I have been working as an intern during the writing of the thesis.

1.2 Research Question

EU ETS will have a significant impact on shipping from 2024, and shipowners who fail to uphold the regulations will face huge economical and operational consequences. Looking at how a shuttle tanker company could prepare for the implementation of EU ETS is important. Based on that I have decided the following research question:

“How can a shuttle tanker company effectively adapt to and secure compliance with the EU ETS regulations?”

The research question will hopefully lead to an understanding of how the regulations would affect Altera's shuttle tanker operations. This would hopefully lead to an understanding of how Altera could adapt to it and secure compliance to the EU ETS regulations.

Limitations:

- The study is based on shuttle tankers operating in the North-Sea.

1.3 Presentation of case company

This bachelor thesis will be written as a research project with focus on a case study as the basis for the project. A case study could be defined as an intensive study of a single unit with an aim to generalize across a larger set of units (Cambridge). The purpose of a case study is to develop in-depth knowledge and a complete understanding of the unit being studied. By using a case study approach, it will give the researcher the opportunity to achieve detailed descriptions of a phenomenon (Wæhle, 2020).

Altera Infrastructure is a leading offshore service group focused on the ownership and operation of critical infrastructure assets in offshore oil regions. Their business units are related to production and transport of crude oil. Primary markets for Altera are the offshore regions of the North Sea, Brazil and the eastern coast of Canada. Altera was previously named Teekay Offshore but was in March 2020 rebranded to Altera Infrastructure as a result of the acquisition by Brookfield Business Partners L.P (Globenewswire, 2020). Altera Infrastructure is divided into separate business units and the unit where I will be stationed is AIS, which is their shuttle and Storage unit. Formally, I will refer to the unit as Altera from now on.

Altera's office is located in Stavanger and their core business is managing and developing the company's offshore logistics business. The unit in Stavanger operates a fleet of 22 vessels which perform offshore loading operations. Their offshore logistics business offers shuttle tankers, floating storage units (FSO) and a unit for maintenance and safety (UMS). The current fleet consists of 19 shuttle tankers, 2 floating storage units and 1 UMS (Altera Infrastructure, u.d.). The research will focus on Altera's shuttle tankers operating in the North-Sea, and how Altera effectively could adapt to the regulations. Shuttle tankers

transport crude oil from offshore oil wells to terminals, refineries or to bigger tankers where pipelines are not suitable, and they are designed to operate in harsh conditions (Vestereng, 2017).

The purpose of the implementation of EU ETS is as mentioned a “cap-and-trade” system. The main objective of EU ETS is to reduce emission by 62% from 2005 to 2030 (European Commission, u.d.). Altera has developed a vision “*to lead the industry to a sustainable future*” (Altera Infrastructure, u.d.). It is fair to say that the European Union’s main objective through the EU ETS is to reduce GHG emissions, which is an aspect of Altera’s vision as well through a sustainable future. Keeping Altera’s vision in mind, it is likely that there will be an internal incentive to comply with the new regulations.

2.0 Literature review

2.1 EU ETS

The European Union Emissions Trading System/Scheme, hereafter EU ETS has been in operation for quite some time in Europe already. However, the system has not applied for the shipping industry previously. From the 1st of January 2024 EU ETS will apply for the shipping industry, and the historical background for EU ETS was one of EU's key policy instruments to deal with climate changes and to reduce emission of greenhouse gasses (European Commission, u.d.). EU ETS will work as a trading system where there is a certain number of allowances (EUAs) in the market. I will refer to European Allowances as EUAs hereafter.

The European Commission will set a cap which defines the number of allowances the industry is allowed to emit every year. This cap is defined, and operators affected by the regulations have no possibility to affect the number of allowances in the market. The cap will be reduced every year which will ensure that all EU ETS sectors will contribute to EU's climate objectives. (European Commission, u.d.). Explaining how this will work in the shipping industry is based on information from the European Commission. A lot of the information and how the rules will be regulated is passed on from verifiers and recognized advisors such as DNV.

Shipping companies will have to purchase and surrender EUAs for each ton of reported CO2 emissions for a specific vessel. EU ETS will apply to cargo and passenger vessels above 5,000 GT from 2024 and offshore vessels above 5,000 GT from 2027. The trading system will cover 50% of CO2 emissions from voyages starting or ending outside of the EU, and 100% of CO2 emissions that occur between two EU ports and when vessels operate within the EU. As seen from figure 1 below, 100% of intra EU and EEA voyages need to be surrendered allowances for. As shown from the green and orange lines, 50% of incoming and outgoing voyages to or from EU and EEA needs to be covered. There is also a rule which regulates transshipment ports; however, this is not relevant for Altera’s trade so I will not drill down on this topic.

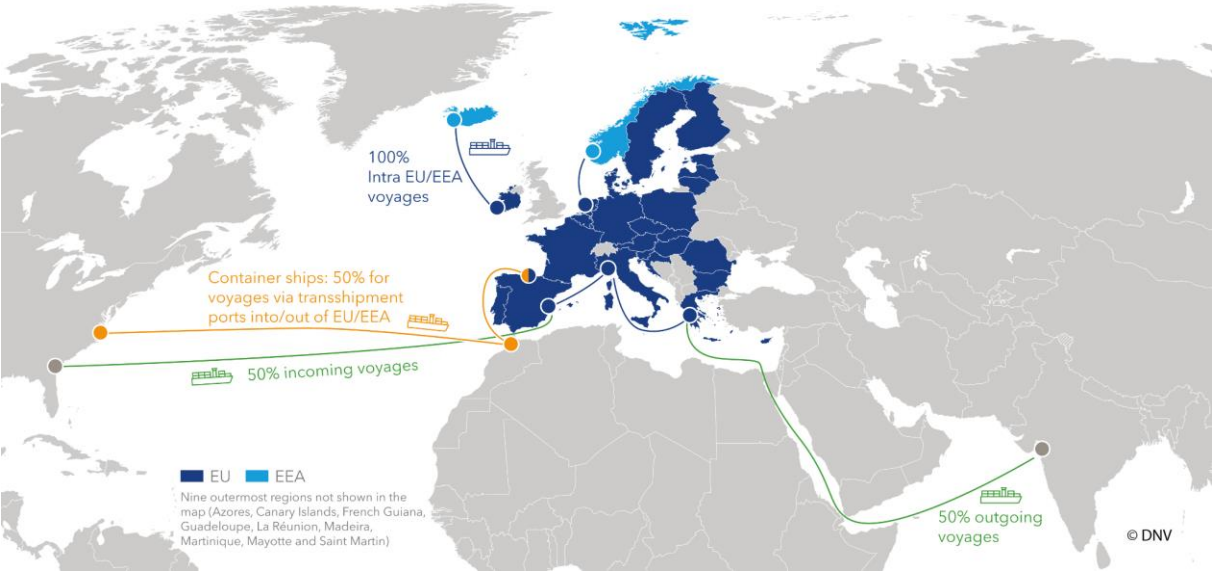


Figure 1: The scope of EU ETS directive: EU ETS based on percentage of emissions on voyages. (DNV, 2023).

To ensure a smooth transition there will be a phasing process over three years where the shipping companies affected will have to surrender a portion of their emissions (DNV, 2023). The most obvious reason for a phasing period is to give the implementation a smooth transition for the ones affected. There are uncertainties related to the regulations which makes it natural with a phasing-period. As seen from the figure below, ship owners will only have to surrender 40% of the emissions reported in 2024. However, you will not surrender the allowances until the year after. So even though the first reporting year of EU ETS is in 2024,

you will surrender them in 2025. Likewise for the reporting done in 2025, 2026 and so on. The phasing period is shown in figure 2 below:

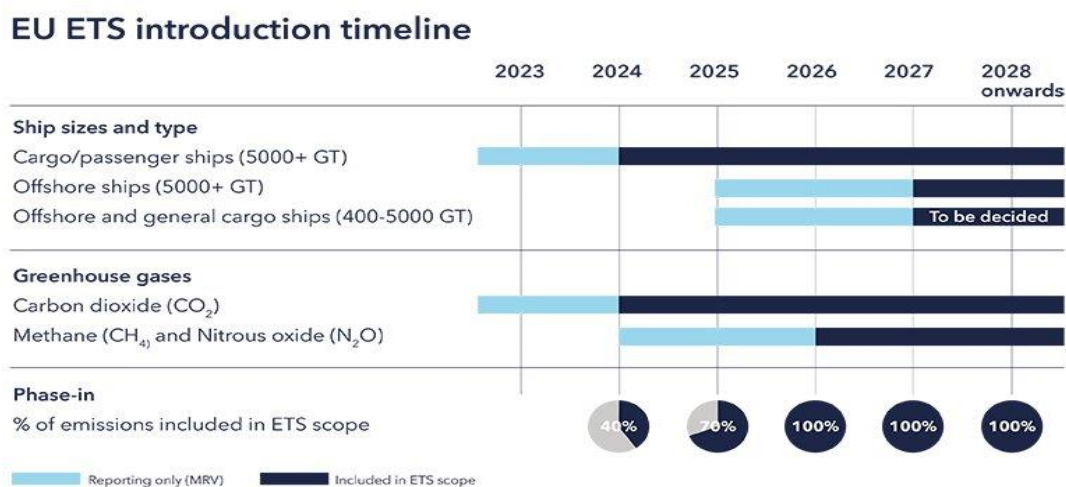


Figure 2: EU ETS introduction timeline. (DNV, 2023).

Shipping companies with vessels operating in ports to or from the EU or EEA will be required to acquire the correct amount of EUAs for the CO₂ emitted from their vessels every year. Reporting of emissions data could be done through the existing MRV reporting system. MRV reporting is mandatory for all ships above 5,000 GT operating on EU related voyages. This means that ship owners which have been reporting through MRV since 2017 have an established system in place which, through adjustments, could serve well for the reporting of EUAs (DNV, 2023).

The MRV system is, as mentioned, mandatory for certain ship types and was in 2017 the first step in a larger process to collect emission data from the shipping industry. The regulation assures that ships within the category must report according to the standards. A vessel's monitoring plan needs to be verified by an independent and accredited verifier such as DNV for instance. The monitoring plan need to describe a vessel's technical data and relevant information according to MRV. Before the report is submitted, an accredited verifier will verify the report to ensure that the report contains the correct data (DNV, 2023).

The first reporting year for ETS will start in 2024, and the ship owners will have to submit verified emissions data to administering authorities within 31st of March each year. The emissions that are reported in March are the actual emissions emitted the previous year. By 30th of September each year the amount of tons CO₂ reported emitted in March, needs to be surrendered to the administering authorities as EUAs. Failing to surrender allowances at the end of September can lead to consequences for a whole fleet, and not only the specific vessel who fails to surrender in compliance with the reporting (DNV, 2023).

The consequence of failing to surrender the correct number of allowances will result in a penalty of 100 Euros per ton of unreported CO₂ emissions for ship owners. However, you will also be responsible for surrendering the allowances you failed to surrender at the submission date. This means that you as a ship owner will have to pay a penalty for the emissions allowances you failed to surrender, but you will also have to acquire the correct number of allowances and surrender to administering authorities (DNV, 2023).

EU's long-term strategy is to become climate-neutral within 2050, which hopefully will result in an economy with net-zero greenhouse emissions. To become climate-neutral within 2050 is an objective which is at heart of the European Green deal - where the ambition is to make Europe the first climate-neutral continent. The European Commission has stated that this is an urgent challenge, but also an opportunity to build a better and sustainable world (European Commission, u.d.).

The strategy is a part of EU's commitment to the Paris Agreement. The Paris Agreement was an initiative to deal with global climate changes and the negative impact it has on the world. It ended with an historical agreement arbitrated from the world leaders at the UN Climate Change Conference on 12th of December 2015. The agreement resulted in a binding international treaty which came into force the 4th of November 2016, with 195 parties involved, including the European Union. The implementation of EU ETS in shipping could be defined because of the EU's commitments to the Paris Agreement and the European Green Deal (UN, u.d.).

An important factor while conducting this thesis is the lack of academic literature. Usually, there are plenty of research articles or academic literature available. In this case the regulation

will apply after the research process is finished. My focus has been to comprehend the regulation through reliable sources of information such as DNV, The European Commissions information pages and other relevant sources such as Norway's ship owner association. Even though EU ETS will apply for shipping from 2024, the system was originally set up from 2005-2007, as a pilot to "learn while doing". The system kept going after 2007 and covered CO2 emissions from power generators and energy-intensive industries (European Commission, u.d.). There have been several upgrades from the pilot project, but the most important thing is that almost all the allowances were given away to the ones participating. In theory there was not any high risks involved for the ones participating as costs were "covered" (European Commission, u.d.). Taking into consideration that other industry have had the period from 2005 until now to prepare and adjust to the system, the shipping industry have much shorter time to adapt and secure compliance. Combining the short phasing period and the lack of relevant research on the regulations, give shipowners a lot to think about the coming years.

2.2 Shipping Markets

The international shipping market is responsible for transporting around 90% of the overall world trade. As there are over 50,000 merchant ships trading internationally, the impact of seaborne commerce is substantial. (International Chamber of Shipping, u.d.). Since markets play such a big part in the operation of international trade it could be smart to clarify what a market is. Jevons, which was a nineteenth century economist who articulated a definition that remains relevant to shipping a century later (Stopford, 2005):

"Originally a market was a public place in a town where provisions and other objects were exposed for sale; but the word has been generalized, so as to mean anybody of persons who are in intimate business relations and carry-on extensive transactions in aunt commodity. A great city may contain as many markets as there are important branches of trade, and these markets may or may not be localized. The central point of a market is the central exchange, mart or auction rooms where traders agree to meet and transact business, but this distinction of locality is not necessary. The traders may be spread over a whole town, or region or

country and yet make a market if they are in close communication with each other.” (Stopford, 2005).

2.3 Tanker Shipping

Tanker shipping refers to transportation of liquid cargo. Tankers have been one of the oldest types of merchant ships and the need for these vessels relates to transportation of primarily crude oil and refined petroleum products where specialized tankers have been made to carry different types of products (Chakraborty, 2021). Crude oil carriers are being used to transport crude oil from rigs to refineries. The biggest crude oil vessels are often referred to as VLCCs (Very Large Crude Carriers) or ULCCs (Ultra Large Crude Carriers) which are the biggest crude oil vessels operating on long range voyages. However, the VLCCs and ULCCs are not feasible for all voyages, and this is where shuttle tankers becomes relevant.

Shuttle tankers are a type of product tanker which transport crude oil from offshore oil fields to terminals where use of subsea pipelines is not feasible. Shuttle tankers operate in areas which often include harsh weather conditions. Major deployment areas are typically the North Sea, Brazilian offshore fields or at the coast of Canada. Shuttle tankers have some differences compared to “standard” crude tankers as they are being loaded directly from FPSOs, FSO’s or various types of offshore loading buoys. To minimize the risk of unwanted incidents, shuttle tankers are equipped with dynamic positioning (DP) systems (Offshoreengineering, u.d.).

The use of DP is essential when loading shuttle tankers at offshore loading facilities. DP systems can control the position and heading of a shuttle tanker using thrusters that are active at all times, which automatically balance the environmental forces such as wind, waves and current. Automatically controlled thrust balances force the vessel to stay in position when environmental forces such as wind, waves and current would have moved the vessel out of position (Offshoreengineering, u.d.).

Shuttle tankers usually vary between 95,000 to 155,000 dwt. Altera’s shuttle tanker fleet in the North Sea consists of 10 vessels. Different sizes serve distinct operational purposes, as illustrated in figure 3 below Altera’s shuttle tanker fleet consists of Aframax (75,000 –

120,000 DWT) and Suezmax (120,000 – 180,000 DWT). Some shuttle tankers spend 25-50% of their operating life in loading mode at the fields, which means that a very specific set of design specifications is required (S&P, 2018).

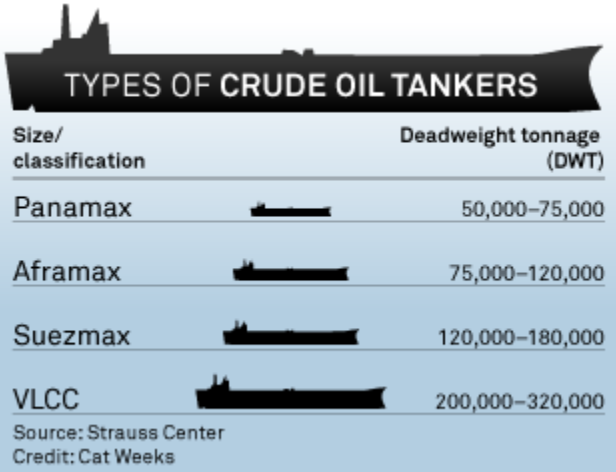


Figure 3: Types of crude oil tankers. (S&P Global, 2018).

2.4 Sustainability & Decarbonization

It is important to look at Altera’s sustainability and decarbonization work in relation to EU ETS. As mentioned previously, Altera has developed a vision to lead the industry to a sustainable future (Altera, 2022) Altera supports the objectives of the Paris Agreement, and the global goal to achieve climate neutrality within 2050. As an organization Altera has set ambitious targets for reducing emission on their shuttle tanker operations. By 2030 the ambition is to reduce the fleet-average carbon intensity indicator (CII) for their shuttle tankers by 50%. A reduction in CII quantifies the efficiency of a vessel in transporting goods or passengers and is expressed in grams of CO2 emissions per unit of cargo capacity and nautical mile (DNV, u.d.).

In 2022 the fleet-average for their shuttle tankers was 3.08 g CO2 per DW nautical mile, which is an improvement by 1% compared to the 2021 numbers (Altera, 2022). According to Altera this is in line with the established reduction pathway they have committed to, at an organizational level. This illustrates the willingness to commit to a sustainable future as well as decarbonization solutions, both of which are essential to achieve the targets outlined in the Paris Agreement.

3.0 Altera's Charter Parties

An understanding of how Altera operates their shuttle tankers is important. In shipping it is common to separate between different charter parties, where some are more occurring than others. A charter party could be defined like this:

“A Charter Party or Charter is defined as a specific contract by which the owner of a ship lets the whole or principal part to another person for the conveyance of goods in a particular voyage to one or more places until the expiration of a specified time” (Keenan, 1959).

In simple terms, a charter party is the mere hiring of a ship. However, there are several ways to fix a charter party. Altera's shuttle tankers are primarily subject to long-term contracts, time charters with fixed rates, bareboat charter contracts or contracts of affreightment. I will explain the charter parties used for the shuttle tankers operating in the North-Sea. (Keenan, 1959). In principle Altera operates with three different charter parties, and these will be explained below. However, the Contract of Affreightment (COA) principle is particularly important for this thesis. The COA principle will therefore be explained in the chapter of the research method.

3.1 Time Charter

A time charter is a time-bound agreement between two parties. A shipowner leases a specific vessel to a charterer for a specific period. Legal regulations are defined in the contract, but the charterers are free to sail to any port or transport cargo which are suitable for the specific vessel. While the charterer has operational control of the ship, the responsibility for maintaining the vessel remains with the owner. For instance, Altera will be responsible for ensuring that the vessel meets internationally accepted standards, as well as the standards demanded from the customer. Three of Altera's shuttle tankers operates on a TC for one of Norway's oil majors. TC agreements could vary in time, from a few days to a couple of years. TC agreements work with the concept of a fixed rate for the period which is defined as the freight rate. Altera enters TC agreements for specific vessels during predetermined periods (Marineinsight, 2019). ”

3.2 Spot

The spot market is regulated through supply and demand where the rates will have to be agreed on. When a shipper, or exporter needs to ship something by the sea they can approach shipowners directly or through a broker which will go out with a position in the market where the details are given. The rates are decided by the willingness in the market, but a good reference is Worldscale which is being used to calculate freight rates for oil tankers and product carrier (Worldscale, u.d.).

Altera do not operate in the spot market daily. Occasionally brokers contact Altera and present opportunities in the spot market. If the position is favorable and suits the schedule Altera might offer a vessel for a given spot freight. The pricing in the sport-market is often very volatile, usually influenced by supply and demand. The spot market is a highly influenced and affected by geopolitical events such as war or weather. Spot rates could be described as a tactical approach and the essence is to avoid committing to any carrier in a longer term (Marineinsight, 2023).

4.0 Research Methods

When choosing science method for the thesis it is important that the choice is reasonable and in correlation to what the thesis should answer. Which methods being used will depend on what you want to discover. No matter what data the thesis wants to investigate, it is normal to separate between qualitative and quantitative methods, or mixed methods, which is a combination that utilizes elements from both qualitative and quantitative methods (Grønmo, 2021). Qualitative method is a research method which is used with collection and analysis of qualitative data. Qualitative data is usually given in writing, which is opposite of quantitative data which is expressed in form of numbers or other quantity terms (Grønmo, 2021).

Qualitative methods are used to give an understanding of people's beliefs, experiences, attitudes, behavior and interactions (NCBI, 2013). In other words, quantitative methods give in-depth knowledge of the subject. Qualitative methods are often used on a few or sometimes only one specific unit. The purpose is to gain in-depth knowledge and a complete understanding of specific contexts or to develop terms, categories or typologies (Grønmo, 2021). There are different ways to conduct qualitative research methods. It is usually an ongoing process with several back-and-forth steps between data collection and analysis. New insights and experiences can lead to adaptations and expansions of the plan which was originally intended (Neurolrespract, 2020). This specific phenomenon is expressed in the critical evaluation section. New insights and experiences made me change the approach, and the research question for the thesis. This will be discusses in the section of critical evaluation. Figure 4 below shows a typical process of a qualitative research process.

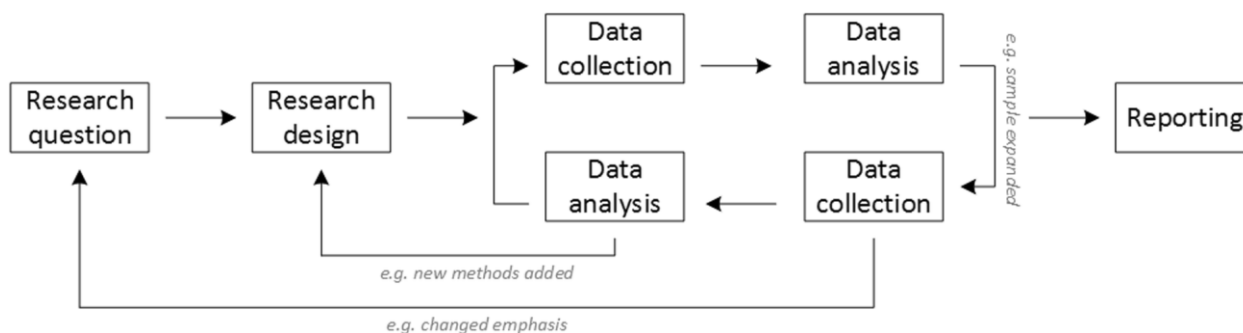


Figure 4: Illustration of how a qualitative research process works (Neurolrespract, 2020).

When choosing which method to use for the thesis, selecting the most suitable form of research method is important. It is common to look at the distinction between qualitative and quantitative methods regarding understanding instead of explanation. By using a qualitative method, you will come closer to the ones you are “investigating” with an open interaction between the researcher and the subject (Tjora, 2021). In this thesis the accessible data will be given by a specific organization which makes it natural to use a qualitative research method.

Being aware of the weaknesses of qualitative research methods is important. In general, the biggest weakness is that it just focuses on a few units or just one case. The method is highly time-consuming. Also, it is important to be aware that individual experiences and knowledge from the subject could influence the observations and conclusions. Qualitative methods are open-ended which means that the subjects have more control over the content and data collected (Yauch and Steudel, 2003). On the other hand, since qualitative methods are open-ended, it allows the subjects to raise issues that matter most to them which in turn means the subject will provide information that is not pre-assumed (Yauch and Steudel, 2003).

4.1 Case-Study

Case-Study is a research method that is used when focusing on a limited unit. It could be an organization, a country, department, or a municipality. Case-studies are often done with the basis of availability and/or with the researcher's knowledge to it. In many cases it could be possible to obtain access to cases that stem from a relatively open-ended matter and involve research questions that are especially relevant to the specific case you are investigating (Tjora, 2021). In this case the relevance is to gather information on how Altera effectively can adapt to and secure compliance to the EU ETS regulations.

The purpose of a case-study is to develop thorough knowledge of, and to gather an overall understanding of, the unit that is being studied. It is important to be aware of general considerations of a phenomena when studying only one unit. Facts given from a member, or a unit do not necessarily give a representative picture for the whole unit (Grønmo, 2020).

The practical aspect of a case-study is convenient in this matter. While writing the thesis I am working as an intern at Altera’s headquarters in Stavanger. This gives me a unique access

to employees and their working routines. Data collection and information which otherwise would have been difficult to access becomes more available, and as a researcher I get closer to the data needed for the thesis. During the internship I have also had access to internal systems, which has made data collection easier.

4.2 Observation-Methods

Observation is a method which is being used when conducting qualitative analysis. Observation is often referred to as ethnography which is a method for participating, either visible or hidden, for a period in the environment for the subject being studied (Tjora, 2021). The easiest way to define the difference between observation and interviews is that by observing you study what people do, and by interviews you study what people tell you they do. There are several reasons to choose observation methods. First off you get to access social situations, where the ones involved in the situation have not been able to interpret first. This will allow the researcher to access data which have not been processed by the subject before. By observation the researcher gets exposed to the actual working routines and practices done. This could then be compared to what the subjects claim will be done during the interviews, and it will make it possible to get an understanding of what is said, compared to what is done. There are also more pragmatic reasons to choose observation. The most important thing is that you avoid taking the subject(s) out of their social situation or their workplace (Tjora, 2021).

4.3 In-depth Interviews

The most used data generation method we have within qualitative research is different types of interviews. Within the method, semi structured and in-depth interviews have become popular. The goal with in-depth interviews is to create a situation for a relatively free conversation which focuses on predetermined themes which the researcher has decided. The method aims to create a relaxed and spacious timeframe. Aiming to get the subject to reflect on their own experiences and their opinions related to the theme. In-depth interviews use open questions which allows the subject to go in-depth where they have a lot to convey.

It is important to be aware that the subject might add digressions to the theme, which leads to themes or points which were not thought of before. These digressions could be important for the thesis as the subject sees it relevant (Tjora, 2021). The main goal with an in-depth interview is to understand the subject's experiences as well as their reflections on the topic. In a situation where we have a lot of information or knowledge on a topic in advance, where we have easy access to informants, the most natural method would be a quantitative method. However, in situations where we want to explore nuances in the experiences, in-depth interviews are the most appropriate method to use (Tjora, 2021).

As a researcher in this case, I have considered it to be relevant and most useful to perform in-depth interviews with the subjects one-to-one. The purpose is to go in-depth with the subject to get an understanding of their knowledge and relation to the EU ETS regulation which will be implemented the 1st of January 2024. The interviews are being used as a tool to understand the subject's relations to the new regulations.

The interviews were set up to make the subjects as relaxed as possible to make sure they felt comfortable during the interviews (Tjora, 2021). The interviews were conducted at Altera's headquarters in Stavanger, so the subjects did not have to leave the safe environment with which they are familiar. As an introduction to the interviews, I informed them on how the interview was going to be conducted. I encouraged them to speak freely, and questions asked were open to make sure I managed to avoid leading questions. I hope that this approach has led to insights on the topic that I as a researcher had not previously considered.

4.4 Structure

When conducting the interviews, it was important to be structured. The interviews were conducted through three phases, warm up (introduction), reflection, and ending. How the different phases are conducted is illustrated below (Tjora, 2021).

Structure of the interviews:

- 1) Warm up - this phase reflects simple and concrete questions to get to know the subject for the interview. This phase is characterized by questions that appear informal and harmless (Tjora, 2021).

- 2) Reflection - This phase is the core of the interview where the subject can go in depth of the different parts of the research theme (Tjora, 2021).
- 3) Ending - The phase is characterized by leading the attention away from the reflection done in the previous phase. In this phase the goal is to achieve a normalization of the situation between me as a researcher and the subject. Relevant themes to discuss is where the project develops and what the purpose of the data collected is going forward. The phase ends with expressing gratitude towards the subject (Tjora, 2021).

4.5 Ethical considerations

Even though the interviews have been recorded with the acceptance and knowledge of the subjects, some ethical considerations have been made. All recordings and personal data that have been collected will be treated correctly. As mentioned, all subjects to the interviews were made aware of how the information would be managed prior to the interview. The interviews have been recorded by sound and will be stored digitally until the completion of the study. None other than myself as the researcher and the subjects will be given access to their recordings, and as soon as the study is completed the data will be deleted from all platforms. None of the subjects had problems with me recording the interviews, and they all signed forms of consent.

4.6 Selection of informants

An important part of the thesis is to recruit relevant informants for the interviews. The main rule in qualitative studies is that you choose informants based on the criteria that the person will be able to comment in a reflected way on the topic. The informants were not chosen just to represent a population, which is the case in Quantitative surveys. The purpose is that the informants should give reasonable and relevant information on the topic (Tjora, 2021).

Since the topic for my thesis is a new regulation applying for the shipping industry, I had to spend some time identifying relevant subjects for the interviews. When I started my internship, it felt overwhelming to identify the correct persons, especially as the topic was quite new for Altera as well. As I started working on the theory of the EU ETS and got to

know Altera's employees better, I started to get a feeling on which ones would be relevant to engage. I started with four subjects and got a feeling that I received a lot of similar input. One thing which I found challenging was that the amount of people working on the implementation of EU ETS internally was limited to a small group. The fifth person I planned to interview had no relation to EU ETS and would not be able to give any input on the topic which would be relevant, so I decided to cancel the last interview. I am aware that in an ideal world the selection of informants should have been bigger, but I decided to interview the ones I knew had knowledge on the topic which could give credibility to the thesis. This led to insights that directed me toward identifying the specific EU ETS topics that might pose challenges for Altera.

The participants have more than 65 years of experience combined in Altera, including the period where the company was Navion and Teekay. Navion was owned by Equinor at the time but was in 2002 sold to Teekay Shipping which now is rebranded through new owners and a new name, formally called Altera Infrastructure.

4.7 Validity & reliability

In qualitative research the terms *credibility*, *verifiability* and *transferability* has been used as indicators for the method. However, since the terms *validity*, *reliability* and *generalizability* are well known and incorporated in research at a general level there is no need to incorporate other terms. These criteria's needs to be given an importance which makes sense for the evaluation of the quality in qualitative research (Tjora, 2021).

Validity is related to whether the answers we find in our research, answers the questions we are trying to ask. In other words, validity is related to whether the research investigates what it is supposed to investigate. To strengthen the validity of the investigation, I must make it clear how I practice the research based on the questions asked. These questions are formulated with basis of the themes I want to explore. The most important source for a high grade of validity is to assure that the research operates within the framework of professionalism anchored in exciting and relevant research (Tjora, 2021). In other words,

validity means to which extent we could establish valid conclusions on what we are trying to investigate (Dahlum, 2021).

A necessary, but not sufficient condition to establish a valid conclusion is reliability (Dahlum, 2021). Reliability refers to relevant connections between empiricism, analysis and theory. Strong and relevant connections between these factors will lead to strong reliability. It is important that these connections are well explained. As mentioned previously the question in the interviews needs to be clear, distinct and not leading as I want honest questions. There is especially one vulnerable relation regarding qualitative research. What does the selection represent, compared to the selection we decide to leave out of the analysis. When analyzing the results from the research, it is important to explain how perspectives or theories have contributed to the analysis and design of the research process (Dahlum, 2021).

4.8 COA - Contract of Affreightment

Altera's shuttle tanker fleet operating in the North Sea is mainly operating under agreements referred to as Contracts of Affreightment (COA). This principle is important to understand in relation to the analysis which will be conducted. Most of Altera's trade is made with COA agreements. The research process has been conducted by using a qualitative analysis and the results is given from the information from the in-depth interviews. A COA is an agreement between a shipowner and a charterer for carrying a certain amount, or a number of loads between agreed ports over a specified period. The COA agreement is not limited to one specific ship, it operates as a series of voyage charter parties (Bimco, u.d).

COAs differ from traditional time charter or a voyage charter where a specific vessel is chartered for a specific voyage or a specific period. Under a COA, Altera commits to provide the necessary vessel capacity to transport an agreed number of loads from an oil field to an agreed port, while the charterer or cargo owner commits to provide as many loads per year as agreed in the COA. The COA determines a pool of vessels which could be nominated for the different loads. Customers will have specifications which includes vessels, specifications, age and so on. This allows the shipowner to have a certain set or number of vessels which

could be nominated for a load when the charterer in the COA nominates a load per the COA agreement (Handybulk, u.d).

There are several benefits of operating under COA agreements, and the most evident is that it is reliable for both parties. It gives reliable access to capacity over an extended period, making it reliable for both shipowners and charterers by facilitating regular transportation of loads. Another advantage of COA is that it gives shipment flexibility in terms of scheduling as the load is not tied to a specific vessel or a single voyage (Handybulk, u.d).

5.0 The results

5.1 Interpretation of the findings

The data analysis is based on the SDI-method. The primary aim of Stepwise-Deductive Induction (SDI) is to enhance the reader's understanding of the qualitative analysis while ensuring the acquisition of valuable knowledge without the need to review all the data generated through the project. A key point of the SDI-method's empirical coding is that it must lie close to the empiricism, and that the codes generated should be related to concepts which already exist in the data material. When conducting coding of the data material, my focus has been to keep the codes as related to the transcription as possible (Tjora, 2021).

By transcribing interviews, it is possible to transform the information from verbal to written text. All the interviews have been transcribed as humans have limited memory which means that important claims from the interviews could disappear without a written transcription. According to Tjora, the first step of analyzing data from the interviews is to code the data mass. Tjora identifies three important objectives with coding of data. The first object is to extract the essence of the empirical material given from the interviews in this case. The second objective is to reduce the volume of the data, and the third and last objective is to help the researcher in generating ideas based on details in the empiricism. A key point when coding the data is to have an "inductive empirical coding." Inductive empirical coding is a way to reduce the impact of expectations related to theories, common knowledge, and presumptions on the topic (Tjora, 2021).

After the interviews were transcribed, it became clear that there was a need to sort the data based on sub-topics related to specific concerns of the implementation of EU ETS. Even though a lot of the same topics are being covered in the interviews, it became clear that there were different concerns related to the sub-topics. By using sub-topics, it is possible to organize the findings from coding the interviews in a way which makes it possible to see the contexts from the different interviews. I have been using Tjora's SDI model as the basis for the empirical coding.

During my period at Altera, I have been involved in the processes which are related to the implementation of EU ETS, which means I have been able to observe their internal approach. When conducting the findings in the analysis I will include my own interpretation as I have been able to take part of the internal discussions.

I have decided to exclude data which I find irrelevant for the thesis and the topic. This needs to be considered as a discretionary assessment as the evaluation is done related to my opinion. The findings should highlight the most important factors to make an adaptation to the EU ETS regulations as smooth as possible. Coding is a process where we want to read the data material with the purpose of mapping relevant data. By using an interpretive reading, I try to achieve an understanding of how the informants interpret and understand the phenomenon I am studying. With this approach it is important to remember that it is not necessarily what the informants says verbatim, but what the basis for the statement is supposed to be (Johannessen et.al., 2016). What the basis for the statement is, is something I have a great prerequisite to understand as I have been involved and taken part in the internal discussions.

Table 1 below is used to illustrate the most important codes which I have generated through the empirical coding. I have decided to sort the codes based on categories which I find relevant based on the empirical coding, and information received through the interviews. The various categories are based on the themes which appear as recurring throughout all the interviews. Although is it important to mention that it has not been a prerequisite, but rather an observation where various concerns emerge that are worth interpreting. These categories became much clearer in the interviews than they have been in the discussions where I have been involved during my period as an intern. It might relate to the fact that all the concerns which came up during the interviews are easier to express one-to-one in a larger group.

5.2 Main Findings

The main findings through the interviews are shown through the analysis category below in table 1. In the analysis categories as well as in the analysis I have referred to the informants as O1 through O4. In this way it is possible to maintain their anonymity as well as the possibility to find the claims in the transcriptions. In this section the main findings are discussed per analysis category as shown in table 1 below. I have conducted the analysis like this so it is easy to separate the categories.

Table 1: The most important findings generated through empirical coding.

Analysis Category	Codes
Emissions Reporting	The reporting is already under control. - O1 Continuation of EU MRV. - O2 Great systems integrated for reporting - O3 Freight in quotas - O4
Legal Regulations	It seems clear - O2 UK is a concern - O1 Uncertain if it is implemented and final - O3
Commercial	Contractual and legal coverage - O1 Commercial aspect is the most important thing - O3 Prepared EU ETS COA clause - O4
Strategies On Acquiring Quotas	This is something we need to be worried about - O4 The discussion hasn't given any clear conclusion - O3 Briefly discussed, but not structured yet - O1

5.2.1 Emissions Reporting

When conducting the interviews, it became clear that reporting is an important part of adapting and to secure compliance with the regulations. According to DNV, shipowners who have been reporting throughout the existing MRV-system have great prerequisites for the reporting which will be required through EU ETS. According to O1, Altera has been reporting the emissions included in EU ETS through the MRV-system since 2018 and claims that the reporting is under control. A quote from O1 when asked if there are any concerns related to the impact of the EU ETS regulations, he is quite confident that they are prepared to report emissions data.

“The reporting is already under control.” - O1

Furthermore, O2 claims that the regulations should be easy to interpret as it is a continuation of the existing MRV-system. Since the MRV-system is the basis for the reporting of the EU ETS it seems like Altera is prepared for what is coming regarding correct reporting of emissions data. O3 also refers to their existing reporting system as a good basis for what is coming.

“The measures we have done so far are not exclusively driven by EU ETS, but by other regulations which have been there for a longer time. This relates to reporting emissions of different sorts for which we have implemented great systems.” - O3

Internally there is a collective understanding that systems for reporting verified emissions data is in place. EU MRV regulation relates to a vessel's monitoring plan, which needs to be verified by an independent and accredited verifier such as DNV. DNV verifies the emissions reported on the basis of voyage log abstract data, bunkers number and external data (DNV, u,d.)

As mentioned previously the MRV-system was integrated in Altera back in 2018. According to DNV, shipowners who are subject to MRV-regulations today are covered on the emissions reporting related to EU ETS which will be implemented in 2024 (DNV, 2023). It is important to keep in mind that the MRV-reporting which has been done until now is done with the basis of a larger process to collect and analyze shipping emissions data. For Altera's customers they have not been directly affected by the CO₂ emitted as there have not been any costs

related to emitting yet. However, this will change when EU ETS is implemented from the 1st of January 2024. The importance of verified emissions data will become more important than ever as there will be costs that needs to be agreed. A statement from O4 is to substantiate that the internal reporting is well prepared.

“We have already started to add what the freight would have resulted in EUAs to our customers to warm them up, and to make sure that they also understand what the consequences will be in the future.” - O4

Understanding the consequences in the future relates to the cost of EUAs which Altera’s customers will be held responsible for surrendering. However, it is important to be aware that the internal understanding of how prepared Altera is to report emissions related to EU ETS could be understood differently by their customers, as the transition to EU ETS from the existing MRV-system introduces costs associated with EUAs. Altera’s customers were previously unaffected by direct emissions-related expenses which means they might view this differently. It is important to keep in mind from a customer perspective that the regulations represent a change in the financial landscape of their shipping operations. This is something which has been discussed internally as well. As soon there are costs involved the possibility for a discussion becomes much more likely than without the cost aspect.

5.2.2 Legal Regulations

While conducting the interviews I tried to understand the internal maturity towards the legal regulations related to EU ETS. It is no secret that the legal aspect of EU ETS is important. First, complying to the legal regulations is a prerequisite as the consequences of not complying could lead to high expenses related to fines, and in worst case exclusion from trading within the European Union and EEA. During my period in Altera, I have observed that there has been an eagerness trying to understand and cover all the important aspects of the regulations.

However, it is no secret that the legal framework is comprehensive. It is difficult to know if all the important aspects have been understood because the regulations have not yet come into effect. My observation from being involved in the internal discussions is that the basics

of the regulations are clear. However, there are some concerns which needs to be discussed. O2 is of the opinion that the regulations seem clear and easy to interpret. O1 shares the same perception on the basis of the regulations and for Altera's trade which usually is regional. Regional trade is understood as the trade internally within the EU and EEA. However, O1 states:

“Where it starts to become complicated and difficult is charters in and out. UK ETS is a concern, we do not know yet how we should handle the loads from UK to EU and UK to UK and so on”.

The statement illustrates an issue related to a big part of Altera's trade. A lot of their customers extract oil from fields located on the British shelf, which per now is excluded from EU ETS. In theory it means that trades entering the UK sector or exiting UK sector activates an exposure which needs to be covered by the shipowner or the charterer. This concern is shared by O4 as well:

“Then there is a third concern, the UK. That is a real concern for us. I hope they implement the same as the EU, but they might do something else.”

The internal legal concerns are primarily related to the uncertainty of the UK. Efforts to understand and prepare for the EU ETS regulations, have been perceived as relatively clear and manageable. My observation from being involved in the internal discussions is that there is evident enthusiasm for comprehending the different intricacies of these regulations, but it is understood that the legal regulations represent challenges that must be solved.

One significant challenge arises through the interviews. O4 noted that there has been a lack of centralized resources or a hub where the regulations applying at present time are available. It seems like the process of staying updated and informed often relies on informal sources such as discussions within the office. However, the concern related to the UK sector seems to be a shared concern among the ones that was interviewed and underscores the challenges posed by regulatory diversity between UK and EU. The concern is shown by the statement below:

“One thing I have experienced as very challenging with the regulations is that it has been difficult to get access to where the regulations are being discussed and what the status

for the work that has been done at all times. I have done several attempts trying to find something which is similar “the government” where you could go in and see which phase the regulations are in and what laws that will apply.” O3

An interesting observation related to the understanding of the legal regulations internally is that the information gathered in the interviews differs a little bit from what I have observed by being present at Altera. When conducting the interviews, the concern regarding the UK became much clearer than it was when I was involved in the internal discussions. This might relate to the fact that I encouraged the interview objects to be as honest as possible when conducting the interviews. Something I mentioned before starting the interviews, was that I appreciated honesty, and answers which were their personal concern or positive thoughts on the different topics. It seems like there is a good understanding of the legal framework and the basics of the regulations that will apply. There are some concerns regarding the UK as discussed above. O4 had a comment which seems to reflect Altera’s maturity related to the legal aspect.

“However, I think some have been a little bit premature, and have started their preparations a little bit early. We have a good management group with X who is a specialist on emissions, X who is sustainability manager, me on the contracts and the desk with X which are responsible for putting quotas on the freight invoices. We also have X on legal, so we have a great team who is working on this, but we must be prepared and get it done.” O4

Overall, O4’s statement emphasizes the need for a balanced and well-coordinated approach to the adaptation of the regulations. There might be a varying level of readiness within the organization; however, having a management group suggest that Altera is actively working to ensure compliance with the EU ETS regulations. The word “premature” stated by O4 is true but with some modifications. As discussed above, a lot of the regulatory framework is clear and distinct. However, as I have seen both from the interviews and from observation while being present at Altera, there are some uncertainties which need to be solved.

5.2.3 Commercial Aspects

The commercial aspect is a topic which is being discussed in all the interviews without me mentioning it. As an introduction to the commercial aspect, it is important to understand how the different vessels are traded.

Three of Altera's shuttle tankers are fixed yearly on TC with an oil major. As O3 states "*For example X sent out a draft on an EU ETS clause before we sent anything to them*". Some of Altera's customers are prepared for the new regulations, but it is not necessary that all of them are prepared.

During the interviews I asked the subjects if they had any concerns regarding the implementation of Altera's shuttle tanker business related to the implementation of EU ETS. The commercial aspect soon became a topic, which raised different concerns. The commercial aspect is naturally important as is it related to the customer relations, but at the end of the day it is the commercial contracts which regulates the income. Once again, the commercial aspect arises from different approaches to what challenges that must be solved. When asking what the concerns of the impact on Altera's shuttle tankers business is regarding EU ETS, O1 states the following:

"What will become the biggest concern is to link the commercial aspect so that we have a contractual and even in some cases legal coverage to get the costs transferred to customers". - O1

Since I started my intern period in Altera, there have been ongoing discussions on how the commercial and contractual issue should be solved. The new EU ETS regulations need to be included in the contracts. As O1 mentioned, how can Altera achieve *contractually and even in some cases legal coverage to get the costs transferred to customers*. The EU ETS clauses need to be added to the existing contracts, which raises a concern as it involves costs.

Some of Altera's customers have already received a draft proposed as an EU ETS clause to be included as an addendum to the existing contracts. This concern becomes clear from O3's perspective as well.

"Even though most of our contracts have clauses which we could use on these types of regulations, I don't think it is that clearly regulated who is obliged to do what between us

and our customers which we optimally would have wanted it to be. So, the commercial aspect to it is the most important thing as I see it.” O3

Once again, the commercial aspect becomes a topic which needs to be solved. What I have observed while being present in the internal discussion is that this is a topic which there are concerns related to. The biggest issue is related to Altera’s customers' understanding on what they must pay or surrender EUAs. This is related to the commercial aspect as this needs to be regulated to existing contracts which does not include EU ETS clauses. To illustrate why this is a concern I think a comment from O3 explains some of the challenges.

“We have a lot of contracts which are way older than EU ETS which are made in a reality where it was completely unthinkable that shipping was going to be included.” O3

The statement above illustrates some of the issues related to the implementation of addendums to the contracts. As O3 mentions, many of the contracts are signed without thinking there would be an opportunity that such a thing as EU ETS would be included. This needs to be solved through dialogue with the customers. O4 made a comment regarding the same concern.

“We have prepared an ETS clause on COA. If we hadn't done that we never would have been able to claim any quotas from 1st of January, and we have also started , I think just before this summer to add what the freight would have resulted in quotas to our customers to warm them up, and make sure that they understand the consequences in the future.” O4

One observation I have made from being present in Altera during the period where the commercial aspect is discussed, is that the concerns related to their customer’s understanding of the implementation. How will Altera’s customers react to the fact that they will be held accountable for the cost of emissions in the period where they have a shuttle tanker on TC or COA for specific periods. At the same time there seems to be an understanding internally that this is something which the customers will adapt to in a reasonable way as long as the regulations originate from the European Commission.

5.2.4 Strategies on Acquiring Quotas

Many of the internal discussions in Altera this autumn have been related to how to acquire quotas for the emissions they are held responsible for in accordance with the reporting. This topic could be divided into two different categories. Firstly, emissions by the charterers through the charterparties. Since most of Altera's trade is done where the customer pays for the bunkers they will be held responsible for the emissions, which in turn mean they will have to surrender the correct amount of EUAs to Altera. How Altera's customers acquire these EUAs does not matter for Altera other than it is important that they get the correct amount of allowances so the exposure for Altera's internal use of the vessels become as low and correct as possible.

Secondly, Altera's own exposure. There will be periods where vessels are off-hire, periods with low utilization which leaves an exposure for Altera. Historical utilization on the vessels have been between 80-85% which give an internal exposure of 15-20%. The utilization is linked to when Altera is paid for operating the vessels, when they are on-hire. These numbers will naturally vary, but it indicates an approximate exposure Altera will be responsible for covering. According to the historical numbers, this gives 15-20% of emissions where Altera needs to acquire EUAs for their own exposure. These allowances will not be surrendered to them by customers, and thus; there needs to be strategies related to the acquisition. O4 had this comment when asked if there were made strategies on when they should acquire quotas:

“No, nothing worth mentioning and that is something that we need to be worried about. That is another thing which I am concerned about.” O4

This issue has been discussed in the EU ETS meetings at Altera but have not given any defined directions on how this exposure should be solved. When conducting the interviews this came up as a topic where there seemed to be different approaches on how these allowances should be acquired. My observation is that there has been awareness on the issue since I started my intern period, but it has not given any clear answers yet. During the interviews it became clear that there were different understandings of how the internal exposure should be solved. O3 said:

“It has been discussed on several occasions, but the discussion has not given any

clear conclusion. All discussions around this have focused on the time-aspect regards to the value of these quotas. So., we have an awareness of it; however, this has not led to a definite conclusion.” O3

The time-aspect is related to the pricing of the quotas. Since the allowances are traded at an exchange there will be fluctuations in prices. The timing of when to acquire quotas could have an impact on the financial results which makes it an important part of the daily operations. As O3 accurately mentions:

“Part of it depends on how well we manage to predict our own personal use next year - there is no reason to wait on acquiring these quotas when they have become more expensive before we buy them.” O3

Many of the discussions have been related to cost. Since the quotas are traded at an exchange there will be fluctuations in the pricing which could lead to a big difference if you buy quotas at EUR 80 or EUR 120. However, there are some discussions on whether acquiring quotas is something which should be handled by Altera or if it should be outsourced to third parties. As the internal discussions have developed through the period I have been there, the option with a third part who could help and trade these quotas has been discussed. There are a lot of companies who specialize in trading quotas on behalf of a customer. This option have been discussed a lot, and O1 answered the following when asked if there have been discussed strategies on acquiring quotas:

“No in reality not. We have briefly discussed it, but not structured it. We aim to go out wide to three or four third parties to get guidance and input”.

6.0 Discussion

This section will be used to discuss the main findings done in the analysis. The discussions are done based on the categories which came up during the interviews. I have decided to discuss them in the same order and structure as I did in the analysis. Once again it is important to emphasize that the findings are done based on the feedback in the interviews, and from my observations done by being an active part of the internal EU ETS discussions done at Altera.

Table 2: The main findings from the analysis

Analysis Category	Main Findings
Emissions Reporting	The informants seem to be confident in the reporting process, with the existing MRV-system providing a strong foundation.
Legal Regulations	The basics of the regulations are perceived as clear, but concerns arose regarding the complexity of the UK. Lack of a centralized up-to-date regulatory information site also raises challenges, but a dedicated group internally works on ensuring compliance even though there are still some uncertainties.
Commercial	The commercial aspect is a concern. There is a recognition of the need to link the commercial and contractual coverage to transfer EUAs to customers; challenges arise due to lack of existing EU ETS clauses. However, there seems to be an understanding that the adaptation will happen eventually as the regulations originate from the European Commission.
Strategies On Acquiring Quotas	This could be divided into two categories. The ones related to customers, and the ones related to Altera's exposure. There is awareness of the issue, but there seems to be a lack of clear and defined strategies on how to address the internal exposure.

6.1 Emissions Reporting

There should be no doubt that the emission reporting is a crucial part in adapting and complying with EU ETS. As mentioned in the discussion in the analysis, DNV looks at the MRV - Monitoring, Reporting and Verification system as a prerequisite for what is coming in 2024. This early engagement through the MRV reporting could be regarded as advantageous which provides a solid foundation on building compliance with the more invasive EU ETS reporting requirements.

Confidence in the emission reporting is something which is echoed by key subjects from the interviews, such as O1, who insists that the reporting is already under control. This is something which is suggested by O2 as well, where the approach is that the continuity between MRV and the EU ETS reporting will make the adaptation and interpretation clear. Another important aspect which seems to be covered through the existing reporting is the verification processes which are necessary. Monitoring plans need to be verified through independent and accredited verifiers like DNV, however there are other third parties who could verify as well. The verification done by third parties would enable reliable voyage data, bunker numbers, and external data which is required to report accurate emissions data.

Altera's customers have not been directly affected by the costs associated with CO2 emissions. However, this is now changing and the importance of verified emissions data will be more important than before as customers will be accountable for the costs linked to emitting CO2. This is mentioned by O4, which informs that Altera have already begun informing customers about the future cost of EUAs.

It seems like the readiness for emissions reporting under the EU ETS regulations is something Altera is well prepared to do. It highlights an internal and common understanding that the reporting experience is already there, and robust internal systems seem to be well implemented. The emissions reporting seems to be under control. If the regulations do not demand anything extra, this part of EU ETS is covered. However, it assumes that the reporting is done according to the existing MRV system.

6.2 Legal Regulations

Complying to the legal regulations is a prerequisite for all shipowners affected by the regulations. The analysis highlights the significance of understanding and adapting to these regulations given the consequences of non-compliance, which could lead to fines and exclusion from trading within EU and EEA. Through the analysis there is shown an eagerness to comprehend and understand the legal aspect of the regulations. There is an proactive approach internally, however there are some concerns especially related to the complexity of the legal framework. It could be challenging to grasp all important aspects and it seems to relate to the fact that the regulations are yet to be implemented.

There is a common understanding between O1 and O2 that the basics of the regulations seem to be relatively clear and easy to interpret, especially for Altera's trade within EU and EEA. However, there are some concerns related to trade within the UK's approach; it creates a significant challenge as much of the trade happens on the British shelf. An interesting observation stemming from the interviews is that the concern related to the UK seems to be bigger than I have experienced from the internal discussions. A lot of this seems to relate to the commercial aspect which I will discuss in the next category.

Some of the internal concerns seem to be related to the access of up-to-date information of the regulations. O4 highlights this as an issue which could be related to the lack of a centralized hub for current regulations. There is no doubt that there is a proactive approach from Altera related to the legal regulations following EU ETS. However, in my opinion the key takeaway is the importance of managing to stay informed of the new information which evolves during the final implementation of the regulations.

6.3 Commercial Aspects

This category is being actively discussed in the interviews without my explicit introduction of the topic. To get an understanding of how the vessels are traded is an essential part of the commercial aspect related to EU ETS. It introduces a need to understand how the EU ETS clause could be implemented into the existing contracts to address emissions-related costs and compliance with the regulations. One of the most central concerns is how to link the commercial contracts to the regulations to ensure that costs related to EU ETS compliance could be carried by the customers. This concern was highlighted by O1, where the importance of achieving contractual, and in some cases, legal cover to pass on these costs to the customers.

Adding the ETS clause to existing contracts is crucial for Altera, and it raises concerns related to costs. As mentioned, some customers have already received draft proposals for EU ETS as addendums to the contracts. The importance of allocating the responsibilities between Altera and their customers is important according to O3 as long as this is not clearly regulated through the existing contracts. The commercial aspect is a recurring theme throughout the interviews, and it requires internal resolutions as well as towards the customers.

A lot of the concerns related to the commercial aspect is related to the customers' understanding of what their responsibility surrender EUAs is. To secure compliance to EU ETS, it is a prerequisite that Altera manage to convey a correct understanding between them and their customers of where the responsibility is related to costs. O3 also mentions the fact that several of the contracts were signed in the past when there were no indications from any governmental agency or similar that such regulations could one day be implemented.

The commercial aspect is highly time-sensitive and the need for customer feedback on the clause is a matter of significant concern. Though all of Altera's customers have received the proposed EU ETS clause, none have returned with feedback on it. I have been involved in the internal discussions, and the efforts made by Altera to communicate and enter an agreement with the customers regarding the EU ETS clause have been present. However, this is a time-sensitive context which needs to be solved. Securing adaptation between Altera and their customers is not just a matter of compliance, it is a crucial step to avoid any disruption in operations and to secure a seamless transition to the new regulations. This concern could

be summarized by O3's comment related to the commercial discussions:

“So, the commercial aspect to it is the most important thing as I see it for Altera's case”.

6.4 Strategies on Acquiring Quotas

The strategy on acquiring quotas was discussed widely through my intern period. However, it hasn't given direction for any clear and obvious solutions to the concern. The topic could be divided into two different categories. Firstly, emissions generated by charterers, where the responsibility lies with the customers to surrender the correct amount of EUAs. The primary concern here is to make sure that the customers acquire the correct amount of EUAs according to what is being reported, and thus minimize the internal emissions exposure. Secondly, Altera's own exposure particularly related to off-hire periods or periods with low utilization which results in a responsibility to acquire EUAs on their own behalf.

O4's concerns reflect the absence of a defined strategy for acquiring of quotas, even though there have been discussions on the topic within the company's EU ETS meetings. The lack of a defined strategy is also mentioned by O3, who highlights that the discussions have predominantly revolved to the timing and pricing of quotas, with focus on the potential financial impact. The need for a defined strategy on how and when to acquire EUAs is important. The strategies can have great financial exposure and should give a direction internally to avoid unnecessary exposure.

As seen from the figure below, the pricing of EUAs is highly volatile and prices have decreased drastically the last 6 months. Early July the pricing of an EUA was just below EUR 100 per allowance. As seen from the figure the allowances are traded close to 70 euro per allowance. As we could see from the figure, high volatility underscores the importance of timing when acquiring EUAs. By having a well-defined strategy, the risk related to the financial exposure could be minimized.

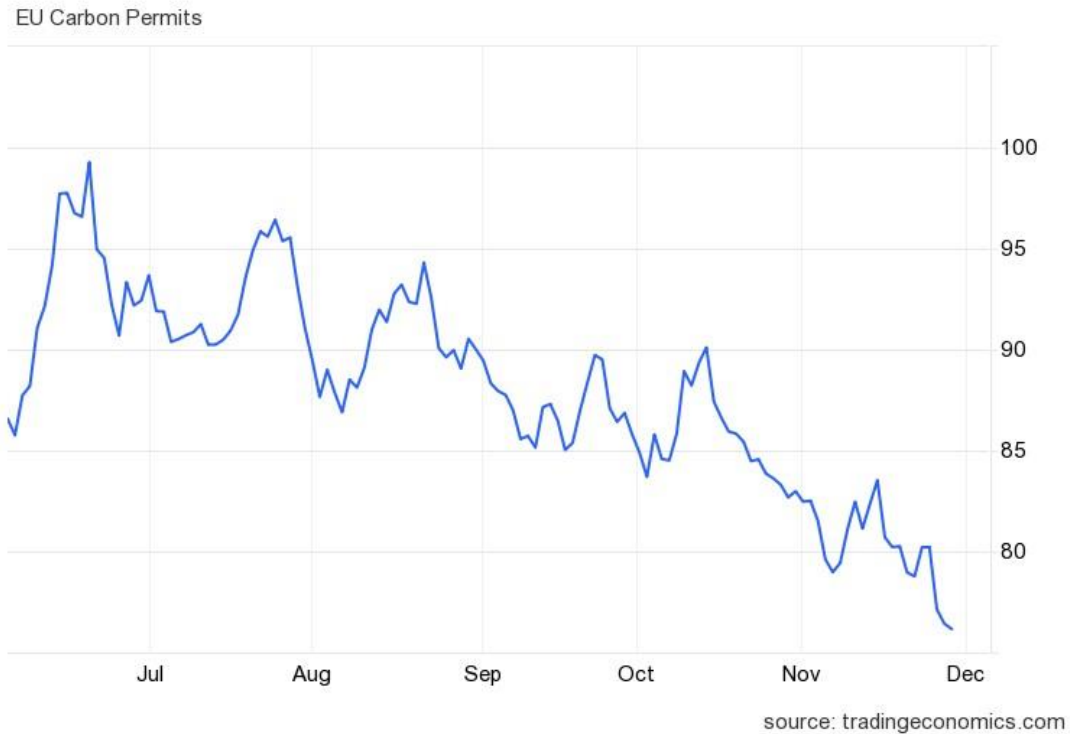


Figure 5: Trading Economics: EU Carbon permits. (Trading Economics, 2023).

The timing of when to acquire EUAs is crucial as fluctuations in the pricing could affect financial results. This leads to deliberations on predicting Altera’s internal exposure, and the discussions relates to whether they should buy EUAs in advance or await possible price fluctuations. Additionally, there are questions on whether Altera should handle quota acquisition internally or if it should be outsourced to third parties who specialize in quotas trading on behalf of customers. O1’s feedback indicates that the option of seeking guidance and assistance from third parties is something which should be explored, emphasizing the demand for a structured approach to quota acquisition strategies.

6.5 Validity & Reliability Related To The Main Findings

As discussed in the research methods, validity and reliability are important for the conclusion, and valid interpretations gives the thesis credibility. The results given in the section of main findings is done with the purpose of identifying where the focus should be to adapt to the new regulations.

The theory is valid to the extent that it comes from the European Commission, and I must trust that the basis for the thesis is credible. The findings from the analysis are done by combining theory and information given in the interviews. Even though this thesis is done based on shuttle tankers, it does not mean that the findings is valid for all shipowners operating shuttle tankers in the North Sea. Based on the theory and information gathered I think it is possible to give a valid conclusion.

Reliability is being used as a necessary condition for the research to be valid. The term is related to the importance of correct data handling throughout the research process. My focus throughout the whole research process have been to ask open questions so the objects could express their honest opinions. This is something which has given the thesis credibility as the data handling have been handled correctly. An important reflection I did after conducting the interviews is that the information that came was quite different to the information I got when we had meetings internally. This substantiates the claim done above, with the data collection being reliable.

6.5.1 Critical Evaluation

There are plenty of potential sources of limitations which could lead in a direction which gives a wrong conclusion. It could be difficult to know if the ones who have been interviewed have acted and said the same things, they would have said without me being present. Informants could say things which do not necessarily reflect reality, and they might say some things because they think that is what I would like to hear. Another issue is the time aspect of the thesis. It could be highly time-consuming to conduct good research by using qualitative research. (Johannessen, et.al., 2016).

The short period of the research process is something which needs to be reflected on. I have been working as an intern at Altera for four months, and I have taken part in their daily operations alongside the writing of the thesis. In an ideal world the research process should have been for a longer period. Another challenge which delayed the process was the fact that I had to apply to NSD (Norsk Senter for Forskningsdata) to get approval before I could start the research process. It took 1,5 weeks to get the approval, which led to the delay of conducting the interviews for my thesis.

Being aware of generalization is something which needs to be included in the discussion regards to the critical evaluation. I have focused on one specific company, which in this case was Altera. I think a lot of the findings in the analysis are relevant for other shipowners. However, my findings are based on the information I have received from the interview which means it does not necessarily become relevant for other shipowners. It is important to keep in mind that the conclusion might be affected by generalization.

The last thing which needs to be discussed is the fact that EU ETS is a completely new regulatory framework for the shipping industry, and therefore the existing amount of literature is limited. It is difficult to predict the impact the implementation of the regulations will have on Altera, and the thesis is conducted based on the understanding of the regulations without it being implemented yet. It is also worth mentioning that the limited number of people working on the topic internally have limited the amount of people I could interview for the thesis.

I would also like to add a reflection on the approach I had when I started my intern period. There was a common understanding between me and Altera that EU ETS was a relevant and important topic which needed to be dealt with. My biggest mistake when I started was that I decided the research question too early, which made the approach a little bit narrow. The result was that I ended up with a research question which was quite opposite of what I originally intended. Instead of keeping the research question open until I had a greater understanding of the theory is something I would have done differently with the experience I have now. However, this is a great experience which I could learn from and keep in mind for the future.

6.5.2 Future Work

When I started my intern period, there was a common understanding that EU ETS was a highly relevant topic for me personally, and for Altera as an organization. We had a lot of discussion on what would be the most beneficial to write about for both parts. The approach was to look at the operational and economic implications as a direct effect of the implementation. However, I soon understood that this was going to be difficult as there were a lot of uncertainties. This is something that could have been done, but it was difficult to do it before the regulations had entered into force.

The financial exposure and operational implications because of the implementation are something which would have been very interesting to look at, one year after the implementation. Then it would be possible to see the financial exposure, and how the different concerns which arise through my intern period. However, this should be done after the first reporting year so all aspects of the regulation could be discussed.

Another thing which could have been interesting to look at in the future, is how the effect on shipowners such as Altera would be in 2026, which is the first year with a complete implementation. Since the regulations are in a phase-in period the first two years, it will not give a complete picture of the implementation until 2026. It will also be possible to reflect on the concerns which came up prior to the implementation, and to reflect on which categories that were handled and implemented well.

7.0 Conclusion

The shipping industry is experiencing a greater focus on sustainability and decarbonization incentives than in the past. This is related to the EU's long-term strategy to become climate-neutral within 2050. During the thesis I identified some key categories which could be defined as prerequisites for an effective adaptation and compliance with the EU ETS regulations for Altera Infrastructure. There is no doubt that the internal incentives to comply with the regulations are present. There is an internal task force who works on the implementation for Altera's case, and it seems like the willingness to succeed is great.

The emissions reporting is well prepared, and the maturity related to the existing MRV reporting give them a great prerequisite to deal with the reporting in an efficient and credible way. The reporting has been expressed as one of the most important things when adapting to EU ETS by DNV. The importance of accurate and verified emissions data is emphasized, especially as customers will have to surrender allowances based on these emissions. This seems to be covered well. There are some legal concerns related to the UK, and the lack of a centralized information hub for up-to-date regulatory information have been raised. Despite the challenges arising, Altera is actively working to ensure compliance, with a dedicated management.

In conclusion, Altera is actively and well prepared for the implementation of the EU ETS regulations. There is confidence in emissions reporting and a proactive approach when it comes to understanding legal requirements. Challenges remaining is to link the commercial contracts to the regulations and define a clear strategy for acquiring quotas. I think communication and an active adaptation with customers will be key to secure a smooth transition, and Altera's willingness to explore different approaches demonstrates a commitment to compliance and sustainability in the face of the changing regulatory landscape.

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9.0 Interview Guide

9.1 Introduction

The basis for the interviews is me being stationed at Altera Infrastructure while writing my bachelor thesis. The thesis should be related to Alteras business, but also related to the maritime sector as the bachelor is called Shipping Management. My thesis will focus on alteras shuttle Tanker business related to the new EU ETS regulations applying from 2024. The superior research question formulated to the thesis will be:

“How can a shuttle tanker company effectively adapt to and secure compliance with the EU ETS regulations?”

Things to go through before the interview:

- Introduce myself if necessary.
- Clarify expectations and use of time, approximately 60 minutes.
- Inform about purpose, theme and issue.
- Make sure the declaration of consent is signed and guarantee anonymity and assure duty of confidentiality.

- Start the sound recording.
- Clarify if the interview object has any questions related to the interview.

The superior research question could be changed if some interesting information or additional info comes up during the interviews. Also there are some concerns that the regulations will change while the thesis is written, so changes could apply.

1. General

- 1.1. How old are you, and for how long have you been working in Altera (including Teekay period)?
- 1.2. What is your work title?
- 1.3. Which department and area of responsibility do you work in?

2. General on EU ETS

- 2.1. Are you familiar with the term “EU ETS” and if so, could you give a short brief of what it means?
- 2.2. Are you aware of the main objectives and goals of the EU ETS?
- 2.3. What are your concerns of the impact on Altera’s Shuttle Tanker business regards to the EU ETS implementation?
- 2.4. Have you personally been following developments related to ETS?
- 2.5. Do you feel the regulations are clear and easy to interpret or understand?

3. Operational implications

- 3.1. Have Altera done any measures to comply with the EU ETS regulations within the Shuttle Tanker business?

- 3.2. Have there been any internal initiatives to educate employees about ETS and its relevance to Altera?
- 3.3. Do you think the EU ETS regulations will affect your daily job?
- 3.4. Is there any way the regulations could give Altera Infrastructure a comparative advantage compared to other ship owners?
- 3.5. What do you consider to be critical factors for successful implementation of EU ETS?
- 3.6. Have there been designated individual areas of responsibility for Altera's response to the EU ETS?
- 3.7. How does Altera stay informed about updates, changes, or developments in the EU ETS that could impact the company's tanker business?

4. Economical implications

- 4.1. What are the economical implications, including costs and investments that Altera might encounter due to EU ETS on their shuttle tanker business?
- 4.2. Do you think the EU ETS will impact the company's financial performance?
- 4.3. EUAs (Carbon Quotas) will vary in price, has there been discussed any strategies on when to acquire quotas?
- 4.4. In terms of customer relations, how does Altera address customers related to costs as a result of EU ETS?
 - 4.4.1. Is there any difference between COA and TC?
- 4.5. Has there been any calculations on the economical exposure for Altera as a result of implementation on EU ETS?

5. Closing Questions

- 5.1. Is there anything else you would like to add?

5.2. 5

Thanks for participating!



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