

Rotterdam School of Management - Erasmus University

Executive Master in Customs and Supply Chain Compliance

Master Thesis

Ensuring Necessary Supply Chain Compliance with Supranational Regulations in a Multinational Manufacturing Company

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Preface

This thesis brings me to the end of my Executive Masters in Customs and Supply Chain Compliance journey. In February 2020, I spent my 29th birthday with a group of people I never met before in Rotterdam. We all just started with the “Executive Master Customs and Supply Chain Compliance” and spent the first week of module one in Rotterdam. The group consisted of students and teachers from different professional backgrounds and from many different countries.

This thesis also is my last step in this part of the journey, and I would like to take the opportunity to express my gratitude to several people. First, I would like to thank all the lecturers and teachers at RSM who held one or more lectures throughout the last three and a half years. I was amazing how often I returned to the office after a week of online learning or in Rotterdam and find that I could immediately put into practice what I had just learned. I really wanted to apply my new skills.

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The past three and a half years have been special and intensive in different ways. Without the support and trust I received, I would never have been able to succeed in this program.


27.03.2023 Sina Klautke

Executive Summary

Climate change is a worldwide problem and requires global commitment and solutions. For this purpose, the European Union introduces the carbon border adjustment mechanism (CBAM) which will prevent carbon leakage and level the playing field for carbon emissions by levying an additional import tax on products placed on the European market. International businesses need to comply with the CBAM regulation. CBAM is not the only upcoming novelty of EU regulation under the European Green Deal. There are other regulations proposed following a comparable approach and structure. Climate change is inevitably linked to companies' corporate social responsibility efforts. The research revealed environmental responsibility is a main incentive for sustainability programs.

In companies there is always the question who will be responsible and accountable for compliance. This research is conducted to demonstrate compliance with a regulation enforced by customs cannot be the responsibility of one single department. It is shown that compliance cannot be ensured without internal collaboration and support.

This thesis follows a mixed-methods approach which combines several independent research methods in one empirical study. It is argued that thinking in necessary conditions helps ensure supply chain compliance with new regulations in a multinational company. The necessary condition analysis method has been proven to be a suitable methodology in different research domains. The CBAM regulation contains different necessary conditions. In addition, the customs-oriented value chain model is used to institutionalize and operationalize necessary conditions into business operations. The model underlines supply chain compliance is a cross functional team effort. It also helps to make comprehensible the various contributions by each involved function participating to ensure compliance with a regulation. CBAM follows the basic principles of the concept of government enforced self-regulation. Climate change is identified to be a driving force for business regulation by government regulators.

It is concluded that trade compliance management is still an underrated topic in academic research. Compliance management in companies and in academic research do not include trade. Ensuring compliance with regulations which involve customs is seen as a trade compliance task within companies. An operating model is developed to emphasize compliance with regulations cannot be the task of one department alone. For CBAM, it became apparent collaboration between many departments such as procurement, trade compliance, sustainability, and master data is required.

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List of Abbreviations

AEO	Authorized Economic Operator
BCA	Border Carbon Adjustments
BEIS	UK Department for Business, Energy & Industrial Strategy
CBAM	Carbon Border Adjustment Mechanism
CCO	Chief Ethics and Compliance Officer
CEO	Chief Executive Officer
CER	Corporate Environmental Responsibility
CI	Continuous Improvement
CSP	Corporate Social Performance
CSR	Corporate Social Responsibility
CTO	Chief Trade Officer
EA	Emission Allowance
EU	European Union
ETS	Emission Trading System
FAQ	Frequently Asked Questions
FDI	Foreign Direct Investment
GHGs	Greenhouse Gases
HS	Harmonized System
IB	International Business
ILO	International Labour Organization
IT	Information Technology
KPI	Key Performance Indicators
MEP	Members of the Parliament
NCA	Necessary Condition Analysis
OECD	Organization for Economic Co-operation and Development
OM	Operations Management
OM	Operating Model
RSM	Rotterdam School of Management
SCM	Supply Chain Management

SDG	UN Sustainable Development Goals
SME	Small and Medium-sized Enterprises
TC	Trade Compliance
TCO	Trade Compliance Official
TFEU	Treaty on the Functioning of the European Union
UK	United Kingdom
UN	United Nations
USA/US	United States of America
WTO	World Trade Organization
WWII	World War II

1. Introduction

1.1. General Context

Climate Change is a familiar and common problem which requires global commitment and solutions. One major problem or perpetrator of climate change are greenhouse gases (GHGs) in the atmosphere from various sources in all countries. In general, governments have the legal authority to deploy laws and regulations in their own territories. Nevertheless, there is no legal mechanism in place that could make countries law-abiding to international climate treaties or force them to negotiate such treaties. One famous example is the 1997 Kyoto Protocol which set internationally binding emission reduction targets on various countries. However, some of the countries did not comply with their commitments and especially the United States of America (USA) did not ratify the agreement. The 2015 Paris Conference unveiled that a system of penalties for non-compliance with international climate treaties would be a crucial success factor for emission reductions.¹ A free-rider incentive is created when signatory countries (the countries that signed and ratified a climate treaty) abide by the treaty and reduce their GHG emissions while non-signatory countries do not encounter abatement costs. This free-rider incentive led to the so-called carbon leakage effect.² Carbon leakage is the phenomenon when unilateral climate agreements abet companies to relocate their production, the GHG emitting activities, to less regulated countries instead of reducing their carbon emissions on a global scale.³ This is especially true for jurisdictions with a carbon pricing instrument in place. Thus, policy makers and environmentalists try to level the carbon playing field. The policy debate focuses on trade measures such as border carbon adjustments (BCA).⁴ The idea behind BCA models is simple: The domestic producer faces additional costs, he must buy carbon certificates according to his local carbon pricing instrument, while the foreign producer can produce the same products without these additional costs. The foreign producer is able to market the goods at a lower price. This would cause unfair competition for the domestic producer. Therefore, an import duty is imposed on foreign-produced goods. It equals the costs the domestic producer must pay to ensure that all goods put on the market face the same carbon price.⁵ In short, a BCA imposes a tariff on certain products imported from countries not limiting their GHG emissions. Another form of a discussed BCA is the export rebate for companies that export to non-signatory countries⁶ but this form will be disregarded in this thesis.

In recent years, the European Commission communicated various measures targeting the European Green Deal. They announced a series of legislative proposals in 2021 aiming to achieve climate

¹ Paola Rocchi, Monica Serrano, Jordi Roca, and Inaki Arto, "Border Carbon Adjustments Based on Avoided Emissions: Addressing the Challenge of Its Design," *Ecological Economics*, no.145 (2017): 126, <https://doi.org/10.1016/j.ecolecon.2017.08.003>.

² Alaa Al Khourdajie, and Michael Finus, "Measures to enhance the effectiveness of international climate agreements: The case of border carbon adjustments," *European Economic Review*, no. 124 (2020): 1, <https://doi.org/10.1016/j.euroecorev.2020.103405>.

³ George Mörsdorf, "A simple fix for carbon leakage? Assessing the environmental effectiveness of the EU carbon border adjustment," *Energy Policy*, no. 161 (2022): 1, <https://doi.org/10.1016/j.enpol.2021.112596>.

⁴ Rocchi, Serrano, Roca, and Arto, "Border Carbon Adjustments," 127.

⁵ Mörsdorf, „Simple fix," 2.

⁶ Al Khourdajie, and Finus, „Effectiveness of international climate agreements," 2.

neutrality in the EU by 2050. One of these proposals includes a carbon border adjustment mechanism (CBAM). It will get into full force by 2026 and will apply partially from 2023 onwards.⁷

Previous academic discussion focused on three issues related to the BCA discussion. First, the practicability of trade measures for environmental purposes and whether they fit in the World Trade Organization (WTO) framework. Second, the economic justification of trade measures for environmental reasons within the framework of conventional trade theory. Third, the effectiveness of trade measures for environmental reasons.⁸ Instead, this thesis aims at looking at the issues and problems companies face that emerge from the CBAM proposal. Companies need to comply with a real BCA from 2026 onwards. Importers involved in international trade, meaning importing from non-EU countries, need to comply with the CBAM regulation and the transitional rules. Considering that, companies need to understand the new rules and implement internal measures to safeguard compliance with the law. This is often not straightforward and easy. It needs to be determined which function in the company oversees the implementation process. This includes the implementation of new or amended policies and procedures to comply with new rules. That function needs to be supported by other functions in the company with regards to data for reporting purposes and other resources. Managers need to outline which monitoring processes and related performance indicators are needed to create reports required by the new laws. These are a few examples of issues and problems companies are confronted with when new regulations and laws are announced and put into force.

1.2. Research Problem and Goal

The CBAM regulation will be enforced by EU customs authorities. Since customs is the enforcement agency, internally in a company this will be seen and treated as a trade compliance problem. In fact, the CBAM regulation will affect various parts of the supply chain and therefore, it is argued that this is not a topic for trade compliance alone. CBAM is only part of a bigger initiative, the Green Deal, and other comparable regulations will follow globally. Furthermore, it is argued that there are already comparable regulations in place. As this topic will be addressed to trade compliance by senior level management, there is the idea to analyze how thinking in necessary conditions can help ensure compliance with such a regulation. The questions from the leadership team will be e.g., what do we need to do to keep the supply up and what is necessary for us to do. Thus, trade compliance professionals need to prepare answers on what is necessary and what is sufficient to be compliant.

Moreover, the question is who will be responsible and accountable to ensure compliance with CBAM and upcoming supranational regulations. For this, a method is needed that makes it easy for all functions to understand and agree to which function a certain process activity belongs. This means, which business process in the supply chain needs to ensure compliance with the CBAM regulation. For this, necessity theories are applied to supply chain compliance by using the necessary condition analysis

⁷ Henrique Simoes, „Carbon Border Adjustment Mechanism as part of the European Green Deal,” Legislative Train, May 20, 2022, <https://www.europarl.europa.eu/legislative-train/theme-a-european-green-deal/file-carbon-border-adjustment-mechanism>.

⁸ Al Khourdajie, and Finus, „Effectiveness of international climate agreements,” 2.

technique of Jan Dul⁹ and the model of the customs-oriented value chain by Iris Amptmeijer¹⁰. In general, the aim is to understand how thinking in necessary conditions can be an appropriate method for trade compliance professionals to manage the company's trade management system. The idea is not to provide an implementation plan but to support the internal discussion companies need to have to ensure compliance with CBAM and comparable regulations. Here, the concept of the customs-oriented value chain model developed by Iris Amptmeijer is applied to demonstrate which customs and non-customs related departments and business areas need to be involved in the successful implementation of CBAM related processes and measures. This concept shall help develop processes and measures that are not a burden to business operations while ensuring supply chain compliance with a new EU regulation. The holistic and structured overview the concept provides will support the decision-making process and increase the acceptance of measures to be implemented. The model clearly shows the points of contact between customs and non-customs related business operations. Additionally, this thesis tests the applicability of the customs-oriented value chain model, and also whether and how these two models can help practitioners in their functional compliance work.

One part of the thesis will aim at challenging and enhancing this existing theory of the application of the necessary condition analysis in other research disciplines. The necessary condition analysis thinking is used as a data source in case study research in the Trade Compliance Management domain. To be precise, it is analyzed whether the proposed carbon border adjustment mechanism regulation in the European Union includes necessary conditions for a multinational company. In their paper "Building and testing necessity theories in supply chain management", Bokrantz and Dul¹¹ argue that necessity theories are usable and useful to practice. Necessary conditions are seen to be clear, practical, and easy to understand. Thus, they are potentially suitable to show decision makers what needs to be implemented at a minimum to deal with a certain problem.

Another important incentive for this thesis research is Corporate Social Responsibility (CSR). Sustainability as one part of CSR is fundamental to everything the company in this research does. For this reason, CSR and environmental sustainability are essential topics for this research. They are important to company stakeholders. Consequently, both concepts are the main reasons why this research is conducted. Compliance with regulations addressing environmental and sustainable issues is important to the company leadership team. The domain of business regulation tries to model regulation as an interaction between the regulatory authority and the company.¹² Compliance with laws and regulations usually requires administrative activities that ensure external reporting or documentation

⁹ Jan Dul, „Necessary Condition Analysis (Nca): Logic and Methodology of ‘Necessary but Not Sufficient’ Causality,” *Organizational Research Methods* 19, no. 1 (2016): 10–52, <https://doi.org/10.1177/1094428115584005>

¹⁰ Iris Amptmeijer, „The customs-oriented value chain How customs-oriented collaboration across the value chain supports value creation in the customs operations of a multinational manufacturing organization” (Master Thesis; Rotterdam School of Management, Erasmus University, 2020), 1-104.

¹¹ Jon Bokrantz and Jan Dul, “Building and testing necessity theories in supply chain management,” *Journal of Supply Chain Management* (2022): 3, <https://doi.org/10.1111/jscm.12287>

¹² Ian Ayres and John Braithwaite, *Responsive Regulation: Transcending the Deregulation Debate* (Oxford Socio-Legal Studies. New York: Oxford University Press, 1992), 54-55.

by businesses to comply with a regulation. Hence, it is relevant to see which business regulation is included in the CBAM regulation and how this interacts with the company's sustainability approach.

This thesis addresses the research problem from three different perspectives. It is a customs' related problem as customs will be the enforcement agency. Customs needs to ensure that companies have sufficient certificates on hand and need to supervise the reporting requirements as outlined in the regulation. In addition, it is an information technology (IT) problem as companies need to flag the commodities in their IT systems and track and trace shipments that include CBAM-relevant commodities. IT resources will be needed to implement a monitoring system and generate regular reports for the enforcement agency. In addition, the certificates need to be bought on the EU ETS system that is available electronically. The ETS system will be explained in chapter 5.1. The supply chain pillar is impacted the most. This research is about supply chain due diligence and supply chain compliance. The impact of a new supranational law on the supply chain of a company that is active in all EU member states and beyond is analyzed. The measures taken to comply with CBAM will impact the supply chain surplus (Customer Value – Supply Chain Cost)¹³. Non-compliance with proposed regulations will most probably lead to additional supply chain interruptions and delays.

1.3. Research Questions

The purpose of this thesis is to understand how thinking in necessary conditions may help ensure supply chain compliance with regulations in a multinational company. In addition, this research aims to advance trade compliance management in companies. The thesis will be structured around the following main research question:

How to ensure supply chain compliance with a (proposed) supranational regulation in a multinational manufacturing enterprise?

The main research question shall be answered with the help of the following sub-questions:

1. What are comparable supranational regulations to CBAM?
2. What are necessary conditions in the CBAM regulation?
3. How can the customs-oriented value chain model help implement appropriate compliance measures and how can thinking in necessary conditions support this process?

The carbon border adjustment mechanism is compared to other EU regulations because the aim is to analyze and outline if the compliance approach created for CBAM can be replicated for other regulations that will follow. Therefore, similarities and differences between CBAM and other regulations are presented to draw conclusions on the generalizability of the research approach. Ensuring compliance with regulations is crucial. Thus, the research method necessary condition analysis is chosen because the underlying principle is that when the condition is not met it will fail. The emphasis is on the term "ensure" and implies what is of most importance for companies to do to be compliant. The customs-oriented value chain model is used to institutionalize and operationalize the necessary conditions into business operations. Moreover, it is used to start and drive the internal discussion as CBAM is only a

¹³ Chopra Sunil, *Supply Chain Management: Strategy, Planning, and Operation 7th Ed.* (Harlow: Pearson, 2019), 17.

proposal for now. Benchmarking with other companies or industries is not possible. Companies need to establish new operating models.

1.4. Structure of the Thesis

This chapter introduces the reader to the underlying topics of climate change and carbon taxation in the EU. The aim of trade measures such as border carbon adjustments are discussed. Moreover, it provides an elaborate description of the research problem, research goal and outlines the research questions. The goal is to investigate how supply chain compliance can be ensured by using the necessary condition analysis method and the customs-oriented value chain model.

The second chapter provides the literature review, which gives the scientific context for this research. The literature review covers the carbon border adjustment mechanism, trade compliance management in companies including the operating model, business regulation of companies, corporate social responsibility and a company's environmental responsibility, and necessary condition analysis in other research disciplines. It is shown trade compliance management is still an underexamined topic although the term "trade compliance" is heavily used. The company view on business regulation is still any administrative activity that requires external reporting. Companies mainly perceive this as an administrative burden. Corporate Social Responsibility is a very conceptualized and model-based construct which comes in various forms and shapes. It is practiced and perceived differently around the globe, but climate change and environmental protection are common themes. It was ascertained that the necessary condition analysis is a suitable research method for various research domains.

The third chapter outlines the research methodology which encompasses a mixed methods approach. A mixed methods approach is a thriving combination of qualitative and quantitative research methods in one empirical study. In total, three main research steps are carried out. First, necessary conditions are extracted from a legal text using qualitative content analysis methods. These are then tested using a survey which is a method of the quantitative research domain. Second, a single case study analysis of one instance of the research object in a real-life context is performed. Third, an adjustment of an operating design model inspired by value creation models is conducted. Each individual research method and the linkages between them for this study are depicted. It is shown how the necessary conditions were extracted from the legal text. Moreover, the structure of the case study analysis is shown, and it is outlined how the customs-oriented value chain model is adapted to achieve collaboration in the company's supply chain to prepare for the carbon border adjustment mechanism.

The fourth chapter provides the results for the empirical part of the thesis, starting with a comparison of the case study object to other legislative proposals of the EU. The analysis shows that many overlaps between the proposed regulations analyzed during this thesis research are visible. This chapter shows the necessary conditions retrieved from the legislative text of CBAM and outlines the results of the survey conducted to verify the correctness and applicability of the derived necessary conditions. Next, the results of the semi-structured interviews are presented and combined with the customs-oriented value chain approach. For this reason, activity tables and one exemplary functional table of the customs-oriented value chain approach are depicted. Finally, important remarks made by the interviewees are listed.

The last chapter provides conclusions of the research findings and answers the main research question and sub-questions. It depicts the validity and reliability of the research approach and outlines the limitations of the research. The chapter ends with suggestions for further research. In the appendix the survey questionnaire used in this research and the results are shown. The appendix also contains the interview guide and the revised interview guide used for conducting interviews during the research process.

2. Review of Research Literature

This chapter provides a review of the literature, which gives the scientific context for the research. According to this thesis' structure, the literature review covers the carbon border adjustment mechanism, trade compliance management in companies including the operating model, business regulation of companies, corporate social responsibility and a company's environmental responsibility, and necessary condition analysis in other research disciplines. Research was done on the key words: carbon border, green deal, fit for 55, operating model, compliance, management, trade compliance, business regulation, corporate social responsibility, CSR, and necessary condition. First, the titles and abstracts of the articles were studied. Second, when they were considered relevant for this research, the text of those articles, papers, chapters etc. were carefully read. References in the various documents were often used to identify additional literature sources. The sources used for this literature research vary from books/e-books/chapters, journal articles and news articles. Statistics about how many sources for each sub-topic were reviewed cannot be given because they were not tracked.

The Carbon Border Adjustment Mechanism is explained in more detail because it is the main object of research. To solve the research problem of the company it is necessary to look into the area of trade compliance management in companies. Operating models explain how functions and department in companies contribute to the company strategy. This sub-chapter also explains the meaning of an operating model. In the area of corporate social responsibility, it is reviewed how environmental aspects play a role. The topic of business regulation encompasses the wide range of how companies are affected by regulation, where they come from and how to best interact with authority regulators. Lastly, it is presented that the method of necessary condition in fact is a tool useful in various research domains.

2.1. Carbon Border Adjustment Mechanism

In December 2019, the EU announced to make the continent climate neutral by 2050 which would be aligned with the Paris Agreement 2015 on climate change. This is outlined in the European Green Deal. For this purpose, all relevant EU policies need to be reviewed and aligned with climate change goals and objectives.¹⁴

From September 2020 to July 2021, the EU announced and published a WTO compatible carbon border adjustment mechanism (CBAM) as part of the Fit for 55 Package. Until May 2022, various committees adopted and published different opinions on the EU Commission's work program on CBAM. In June 2022, the European Parliament adopted its position on the proposed regulation, and the Members of the Parliament (MEP) recommended several changes. They include the addition of other GHG heavy goods such as organic chemical, plastics, hydrogen, ammonia, and indirect emissions.¹⁵ The EU set the ambitious target of a 55% reduction in carbon emissions compared to 1990 levels by 2030, and to

¹⁴ "European Council, 12-13 December 2019," European Council, accessed December 27, 2022, <https://www.consilium.europa.eu/en/meetings/european-council/2019/12/12-13/>.

¹⁵ "CBAM: Parliament pushes for higher ambition in new carbon leakage instrument," European Parliament, accessed December 27, 2022, <https://www.europarl.europa.eu/news/en/press-room/20220603IPR32157/cbam-parliament-pushes-for-higher-ambition-in-new-carbon-leakage-instrument>.

become a climate-neutral continent by 2050.¹⁶ For this purpose, the EU published its Fit for 55 package which is a set of legislative proposals to revise and update EU legislation and policies. The Fit for 55 Package includes a comprehensive set of changes to the existing EU's emissions trading system (EU ETS). These changes should result in an overall emission reduction of 61% by 2030 as compared to 2005. CBAM is designed to function in parallel with the EU ETS, to mirror and complement its functioning on imported goods.¹⁷

The European Union Emissions Trading System came into force in 2005 and is an instrument of EU climate policy with the aim of reducing greenhouse gas emissions by issuing a limited number of emission rights and then trading them on a market. The EU ETS is the first cross-border and world's largest emissions trading system.¹⁸ The ETS was implemented to control GHG emissions in setting annual restrictions and in demanding emission allowances (EA) for every emitted ton of CO₂. As a result, the ETS internalizes environmental costs for companies and adds this new cost type to the production function of companies.¹⁹

Companies having production facilities in the EU could move carbon-intensive production abroad to take advantage of lax emission standards in other countries. This phenomenon is called carbon leakage. This would undermine the EU's ambitious climate change objectives. CBAM will equalize the price of carbon between domestic products and imports. Initially, CBAM was planned to apply from January 1, 2023, with a transitional period until the end of 2026. When CBAM is in force, EU importers would need to buy carbon certificates corresponding to the carbon price that would have been paid, had the production taken place in the EU. The price for the certificates will mirror the price of carbon certificates at the ETS and will be published on a website on a weekly basis. CBAM would initially apply only to a selected number of goods which are considered to have a high risk of carbon leakage. The goods in scope of CBAM are iron and steel, cement, fertilizer, aluminum, and electricity generation. Moreover, to provide businesses and other countries with legal certainty, CBAM will be phased in gradually, beginning with a reporting system in 2023. This will provide every party time to prepare until the final system is in place.²⁰ Schippers and de Wit examine the legal structure of the CBAM regulation and provide counselor expertise on selected contents of the CBAM proposal.²¹

In December 2022, a joint declaration by the Presidents of Parliament, Council and Commission on EU legislative priorities for 2023 and 2024 was published. It commits the three EU institutions to giving utmost priority to initiatives aimed at delivering on the European Green Deal, achieving the digital

¹⁶ "Carbon Border Adjustment Mechanism: Questions and Answers," European Commission, accessed December 27, 2022,

https://ec.europa.eu/commission/presscorner/detail/en/qanda_21_3661.

¹⁷ "Fit for 55," European Council, accessed December 27, 2022,

<https://www.consilium.europa.eu/en/policies/green-deal/fit-for-55-the-eu-plan-for-a-green-transition/>.

¹⁸ "EU Emissions Trading System (EU ETS)," European Commission, accessed December 27, 2022, https://climate.ec.europa.eu/eu-action/eu-emissions-trading-system-eu-ets_en.

¹⁹ Carola Hammer, "Modelling impacts of the European Emission Trade System on the future energy sector," in *Operations Research Proceedings 2011*, eds. Diethard Klatte, Lüthi Hans-Jakob, and Karl Schmedders (Berlin: Springer, 2012), 129.

²⁰ European Commission, "CBAM FAQ."

²¹ Walter de Wit and Martijn L. Schippers, "Proposal for a Carbon Border Adjustment Mechanism," *Global Trade and Customs Journal* 17, no. 1 (2022).

transition, and enhancing the EU's resilience, creating an economy that works for people, making Europe stronger in the world, promoting our European way of life, and protecting our democracy and values.²² Out of 164 listed initiatives, 52 initiatives, which is one third of all initiatives, are linked to the European Green Deal. Many of the initiatives relate to updating existing directives and regulations. Other initiatives aim at the creation of new directives or regulations. Among the initiatives, some common themes can be found: scarcity of water, waste management, transport, and reduction of greenhouse gases (GHGs).

In December 2023, the latest provisional agreement was reached. The MEP and the Council agreed on changes to be included in a revised CBAM proposal. The provisional agreement extends the scope of products subject to carbon taxation and indirect emissions. All new rules will be in compliance with WTO rules and centralized governance will be the Commission's responsibility. By the end of 2027, the Commission will conduct a complete review of CBAM including an assessment of progress made in international negotiations on climate change. The start of the transitional period of CBAM is postponed to October 2023 and the full implementation date is open.²³

2.2. Trade Compliance Management

Companies need to manage their customs operations on a strategic and operational level. Existing literature does not address the functional level of customs management in companies. This is the result of a research conducted in 2014.²⁴ The research focused on the question what customs managers in businesses do and how they go about it. The main methods were literature research and interviews. In 2016, the same interview results were analyzed again, and additional findings and conclusions were made.²⁵ In the following, findings from both papers will be depicted. Customs management within companies is the domain of a small group of experts and companies view the topic as commercially and legally sensitive. The function of a customs manager is broad and comprises different activity areas such as logistics support, supply chain management and regulatory compliance. The extent of involvement in each activity area is diverse. The traditional customs manager makes use of a common toolbox to perform his work which includes being a go-to person, the company administrative system, and to contract out certain trade related activities such as customs brokerage. The interviews highlighted that customs management should be part of the company's strategic decision-making processes such as location and logistics decisions because without the consent of customs agencies goods cannot be cleared through a border. In addition, it was emphasized that the main work of customs management in companies is still focused on applicable customs procedures and legislation to avoid breaches. This is

²² "EU institutions agree on joint priorities for 2023 and 2024," European Commission, accessed January 3, 2023, https://ec.europa.eu/commission/presscorner/detail/en/ip_22_7733.

²³ "Deal reached on new carbon leakage instrument to raise global climate ambition," European Parliament, accessed December 27, 2022, <https://www.europarl.europa.eu/news/en/press-room/20221212IPR64509/deal-reached-on-new-carbon-leakage-instrument-to-raise-global-climate-ambition>.

²⁴ Andrew Grainger, "Customs management within multinational companies," *NUBS Research Paper Series* no. 06, (2014): 3.

²⁵ Andrew Grainger, "Customs management in multinational companies," *World Customs Journal* 10, no. 2 (September 2016): 18.

conditional to the fact that failure to comply adequately with customs requirements will impact the company's ability to manage its supply chain management operations efficiently.

Grainger's literature review²⁶ exposed that the literature of customs and their significance for businesses and supply chain is still young. Nonetheless, the last volumes (since volume 10 2016) included no papers addressing the topic specifically. All publications focused on the management and work of the administrative body and not on businesses. Recent publications address the role of women in customs leadership, but the research was conducted within customs authorities in Asia-Pacific.²⁷ Other research focused on gender diversity gap in administrations in the Asia-Pacific region²⁸ and in Eastern and Southern Africa.²⁹ Another paper looked at the wellbeing of customs officers in customs administrations³⁰. One study aims to provide opportunities to better manage customs and border related costs in supply chains and slightly touches upon the regulatory compliance management part.³¹ Heijmann et al. explored the use of data and the data pipeline model for customs to better align with supply chains, but this paper focuses merely on customs supervision.³² Widdowson analyzed resources developed by the world customs organization and how they can be used at a strategic and operational level to manage compliance in a more structured and systematic way in administrations.³³

Traditional compliance management neglects and ignores trade and supply chain compliance. In fact, the recently published report by the German professional association of compliance managers³⁴ is about competition law, money laundering, data privacy, anti-corruption, and bribery only. The report looks back at the last ten years of research conducted by the association itself. The report highlights changes and interesting developments in the area of business internal compliance management for the last decade. Nonetheless, the words supply chain, customs, import, export, or trade are not mentioned in the entire report. Only the German Supply Chain Due Diligence Act slightly touches upon challenges for compliance manager in the area of supply chain diligence and trade management.

²⁶ Grainger, "Customs management within companies" 18.

²⁷ Sreya Hong, Michelle Bond, Losalini Lesu, Melani Madhubhashini, Senali Lokubalasoorya, and Dini Ratnasari, "Women in customs leadership: why does it matter?," *World Customs Journal* 16, no. 1 (March 2022): 125.

²⁸ Anita Dodds, Anneka Farrington, Phillip Dowler, Joel Carruthers, Michelle Bond, Anne Linn Jensen, and Ulrich Meiser, "Get ready for a new mindset on women in customs leadership," *World Customs Journal* 16, no. 1 (March 2022): 117.

²⁹ Dennis Ndonga, Sendra Chihaka and Anne Fielder, "Integration of gender practices and promotion of diversity in customs and trade: the case of East and Southern Africa," *World Customs Journal* 15, no. 1 (March 2021): 77.

³⁰ Akosita Valamalua, Shirley Mohanakumar, Indu Ranathunga, and Sanduli Medonza, "Bolstering resilience in Customs: the wellbeing of our people," *World Customs Journal* 16, no. 1 (March 2022): 151.

³¹ Andrew Grainger, Roel Huiden, Boriana Rukanova, and Yao-Hua Tan, "What is the cost of customs and borders across the supply chain? ... and how to mitigate the cost through better coordination and data sharing," *World Customs Journal* 12, no. 2 (September 2018): 3.

³² Frank Heijmann, Yao-Hua Tan, Boriana Rukanova, and Albert Veenstra, "The changing role of Customs: Customs aligning with supply chain and information management," *World Customs Journal* 14, no. 2 (September 2020): 131.

³³ David Widdowson, "Managing customs risk and compliance: an integrated approach," *World Customs Journal* 14, no. 2 (September 2020): 63.

³⁴ Melanie Baier, „Ein Blick zurück – nach vorn,“ *Berufsverband der Compliance Manager*, no. 1 (November 2022): 25.

Moreover, a review of the Journal of Regulatory Compliance, which is one example for literature on compliance, was conducted. The Journal publishes scholarship from the interdisciplinary perspectives of law, economics, philosophy, and ethics. It seeks to advance academic dialogue on managing regulatory risk in a commercial enterprise, the experience of the regulated actor, and analysis of regulations in the context of organized efforts to comply with law.³⁵ The search for the keywords “customs” amounted in results for customer or customized, “supply chain” showed articles about the impact of Covid-19 pandemic on supply chains, and “import and export” led to articles about the export of FFP2 masks during the pandemic. This shows as well customs compliance or trade compliance is not part of academic research.

Compliance sees a changing shape of organizational life evidenced in the growth of outsourcing. This means larger supply chains, more suppliers, and contractors. The role of compliance is to address the issue that third party supplier and contractor operate with laws and regulations as well as meet the company’s standards. An effective ethics and compliance program requires senior management to oversee the company’s ethics and compliance program and to understand internal and external legal and compliance risks. The “tone at the top” is a key factor for effective compliance programs. One part of an effective compliance program is the need for an enhanced due diligence of third parties. Such programs should extend up and down the supply chain because the growth of supply chains represents significant potential compliance risks to the organization. With regards to risks resulting from growing supply chains, this paper as well mentions only bribery, corruption, fraud, and conflict of interest as the critical compliance risks. Enhanced due diligence of supply chains should be conducted by compliance together with the business’s procurement, or operations functions³⁶.

As companies face evolving legal obligations and the problems posed to multinational corporations are more complex than ever before, companies require teams of people with different expertise to collaborate to understand what the regulations require. The paper by Mamaysky³⁷ mentions obligations related to accounting, data privacy, anti-bribery, anti-fraud, anti-corruption, and corporate governance. It also lists the environment and industry-specific requirements among many others as compliance obligations of a company. This is the only imaginable reference to customs and export control compliance in a company when the reader wants to include trade compliance to the obligations. Further on, the paper emphasizes the need of a chief ethics and compliance officer (CCO). But because trade compliance is usually not the responsibility of the ethics and compliance department, recent publications, and discussions on the internet and during functional conferences see the need for companies to establish the chief trade officer (CTO) role. Trade Compliance became a significant source of corporate risk and therefore chief executive officers (CEO) need to navigate the company through geopolitical hazards and make supply chains more resilient. So far, trade risk management has usually

³⁵ “Journal of Regulatory Compliance,” School of Law, Loyola University of Chicago, accessed December 10, 2022, <https://www.luc.edu/law/academics/journals-publications/journalofregulatorycompliance/index.cfm>.

³⁶ Michael G. Silverman, “Organizational Compliance and Ethics in an Era of Outsourcing”, *Journal of Regulatory Compliance*, no. II (Fall 2017): 4-15.

³⁷ Issac Mamaysky, “Understanding Ethics and Compliance: A Practitioner’s Guide to Effective Corporate Compliance Programs”, *Journal of Regulatory Compliance*, no. VI (Spring 2021): 70-72.

been a midlevel function somewhere in operations, legal, or finance.³⁸ KPMG published guidance on what a chief trade officer should do during the first 100 days of work.³⁹ Mainly, a CTO should set the strategic priorities, understand comprehensively the company's trade profile, and its past, present, and future state. Recently, even the EU commission announced a Chief Trade Enforcement Officer whose main role is to manage the EU's trade program.⁴⁰

2.3. Operating Model of Trade Compliance

For a better comprehension of the research problem, it is of importance to understand the operating model (OM) of a multinational company. The operating model emphasizes how the functional department contributes to the company's strategy. Therefore, the structure, processes, and performance of the department are outlined. Before presenting the operating model of the company, it is explained what an operating model is.

Research by Bateman was conducted in 2019 to explore the concept of operating models.⁴¹ She found that the term "operating model" has been popular in the last ten years but there is a lack of academic research to define what operating model means in a management context. Most of the discussion around operating models is driven and lead by consulting companies. For example, McKinsey's "Next-generation operating model"⁴², Deloitte's "Digital Operating Model"⁴³, Deloitte's "Legal Operating Model"⁴⁴, BCGs "Agile Operating Model"⁴⁵, Bain's "Operating Model"⁴⁶, or KPMG's "Target Operating Model".⁴⁷ One major finding is that although there seems to be an implicit understanding of the term "operating model" it is in principle based on the IT discipline. Nevertheless, there are common themes to most of the model frameworks: service proposition, process category, management system/framework, performance management, organization, resources, and technology. Consultancies

³⁸ "Why your company needs a "chief trade officer," BCG, accessed November 22, 2022, <https://www.bcg.com/publications/2022/why-international-trade-companies-need-a-chief-trade-officer>.

³⁹ "New Chief Trade Compliance Director's First 100 Days," KPMG, accessed December 17, 2015, <https://assets.kpmg/content/dam/kpmg/pdf/2015/09/directors-first-100-day-web.pdf>.

⁴⁰ "Chief Trade Enforcement Officer," EU Commission, accessed December 17, 2022, https://policy.trade.ec.europa.eu/enforcement-and-protection/chief-trade-enforcement-officer_en.

⁴¹ Nicola Bateman, "Operating Model: an exploration of the concept," Loughborough University Research Repository, September 21, 2017.

⁴² "McKinsey on Digital Services: Introducing the next-generation operating model," McKinsey, accessed December 22, 2022, <https://www.mckinsey.com/~media/mckinsey/business%20functions/mckinsey%20digital/our%20insights/introducing%20the%20next-generation%20operating%20model/introducing-the-next-gen-operating-model.ashx>.

⁴³ "Digital Operating Model: Der Weg zur erfolgreichen Transformation," Deloitte, accessed December 22, 2022, <https://www2.deloitte.com/de/de/pages/technology-media-and-telecommunications/articles/digital-operating-model.html>.

⁴⁴ "Legal Operating Models: Vertrauen bei der Transformation," Deloitte, accessed December 22, 2022, <https://www2.deloitte.com/dl/de/pages/legal/articles/legal-operating-models.html>.

⁴⁵ "Agile as the Next Government Revolution," BCG, accessed December 22, 2022, <https://www.bcg.com/publications/2018/agile-next-government-revolution?linkId=55793077&redir=true>.

⁴⁶ "Organisationsdesign & Operating Model," Bain, accessed December 22, 2022, <https://www.bain.com/de/managementkompetenzen/organisation/organizational-design--operating-model/>.

⁴⁷ "KPMG Target Operating Model," KPMG, accessed December 22, 2022, <https://home.kpmg/ch/de/home/themen/2021/04/target-operating-model.html>.

usually use various management tools such as value chain maps, scorecards, etc. to support the design process of the operating model.

Another attempt to capture all nuances of operating models was published in 2016 by Kesler and Kates.⁴⁸ They argue that globally competing companies must have sophisticated playbooks to sustain their competitive advantage. The senior management of these companies must design organizations capable of managing the challenges of complex, global strategies. They recommend the global operating model tool which promotes the use of a matrix organization. Based on several case studies from various global companies, they conclude that a global operating model encompasses the combination of organizational structure, process, governance forums, metrics, and reward systems.

In 2011, as part of the IT domain, de Vries et al. outlined that an operating model is a commitment to a way of doing business. The creation of an OM is intended to achieve visibility for company-wide process standardization and data centralization. In addition, an OM governs how a company shall implement processes.⁴⁹

The latest publication on the operating model concept is from 2021 and was published by Campbell and Gutierrez where they outline why a company needs an operating model.⁵⁰ The OM is an invaluable tool to determine what changes are needed in the organization and its operations to implement any new strategy. In an OM the high-level decisions are captured. It takes the strategy and outlines operational choices and maps the work to be done. In general, the OM should be designed by the top management team responsible for the strategy but as a lot of decisions to operationalize the new strategy are to be made, delegation of tasks to individual members several levels down the hierarchy is required. They also conclude that the operational model discussion is mainly driven by consultant companies. Moreover, next to Bateman they also found common themes in all frameworks: work processes, people, organizational structure, information systems, locations, operating technology, supplier relationships and more. Lastly, they also found that consultancies use tools such as organization charts and process maps to visualize themes in the OM.

In annex one the company's Trade Compliance department operating model is depicted which is based on the KPMG, BCG, and Deloitte legal model. Trade compliance is a separate organization being part of the integrated supply chain organization. The company operates in a matrix organization while departments itself follow a line organization. The role of the trade compliance organization can be compared to an internal consultant and auditor for topics related to customs and export controls. Sustainability is of major importance for the company and must be included in everything the company does.

⁴⁸ Gregory Kesler and Amy Kates, *Bridging Organization Design and Performance: 5 Ways to Activate a Global Operating Model*, Hoboken, New Jersey: John Wiley & Sons, 2016.

⁴⁹ Marne de Vries, Alta van der Merwe, Paula Kotzé and Auroa gerber. „A method for identifying process reuse opportunities to enhance the operating model,” *IEEE International Conference on Industrial Engineering and Engineering Management*, (December 2011):1005.

⁵⁰ Andrew Campbell and Mikel Gutierrez, “Why You need an Operating Model: To Align Your People and Deliver Your Strategy,” *Management and Business Review*, (Spring 2021): <https://mbrjournal.com/2021/11/01/why-you-need-an-operating-model-to-align-your-people-and-deliver-you-strategy/>

2.4. Corporate Social Responsibility

The topic of Corporate Social Responsibility (CSR) has a long history.⁵¹ Nowadays, companies must meet new performance standards ensuring sustainable outcomes to maintain a competitive advantage and to focus on economic performance. A review of the last decades shows the tendency and need for companies to become more responsible for their negative externalities.⁵² The concept of CSR is based on three unique terms. All forms of businesses from small to large companies are in the scope of corporate. Social refers to welfare of a community which can vary from a local community to the whole world. Responsibility means to be held accountable by society. Various models, conceptualizations, and definitions of CSR evolved since the 1960s. Hence, it is difficult to nail down what CSR actually is. When a company is thinking about establishing a corporate CSR program the basis or starting point must be sound business practices. As most valuable perceived by the public are safe products, clean environment, legal compliance, and honesty. All concepts, models and definitions have several dimensions in common which are stakeholder, social, economic, voluntariness and environmental.⁵³

CSR has many complementary concepts like business ethics, corporate citizenship, or corporate purpose-driven businesses to name a few. These are distinct but overlapping frameworks. Recent research wants to advance existing concepts and focus on the business case of CSR or upstream/downstream CSR. Upstream/downstream CSR focusses on shared responsibility and ethical implications of corporate supply chains and the demands for CSR posed on multinational corporations.⁵⁴

CSR varies around the world and depends on sociopolitical and institutional infrastructure of a country.⁵⁵ The issue of different nation states and their role in CSR remains a to be discussed issue.⁵⁶ There is a difference between CSR practices in various nations e.g., between the United States (US) and Europe.⁵⁷ In the US CSR is more explicit meaning the programs are self-interest driven, company policies are published and whole strategies and programs are launched. In the rest of the world but especially in Europe CSR is more implicit, meaning that it is part of the company culture.⁵⁸ This discussion was triggered by Matten and Moon's typology of implicit and explicit CSR in 2008. In addition, the EU's approach on CSR is not a single one and varies between EU member states and corporations.⁵⁹

⁵¹ Archie B. Carroll and Jill A. Brown, "Corporate Social Responsibility: A Review of Current Concepts, Research, and Issues," in *Corporate Social Responsibility*, ed. by James Weber and David M Wasieleski (Bingley: Emerald Publishing Limited, 2018) 40.

⁵² Daina Mazutis, "Much Ado about Nothing: The Global Pace of CSR Implementation in Practice," in *Corporate Social Responsibility*, edited by James Weber and David M Wasieleski (Bingley: Emerald Publishing Limited, 2018) 178.

⁵³ Carrol and Brown, "Review of Current Concepts," 44-46.

⁵⁴ Carrol and Brown, "Review of Current Concepts," 59-60.

⁵⁵ Carrol and Brown, "Review of Current Concepts," 41-42.

⁵⁶ Ralph Tench, Brian Jones, and William Sun, "The Critical State of Corporate Social Responsibility in Europe: An Introduction." in *The Critical State of Corporate Social Responsibility in Europe. Critical Studies on Corporate Responsibility, Governance and Sustainability*, ed. by Ralph Tench, Brian Jones, and William Sun (Bingley: Emerald Publishing, 2018) 3.

⁵⁷ David Vogel, *The market for virtue: the potential and limits of corporate social responsibility* (Washington: Brookings Institution Press, 2005) 132.

⁵⁸ Carrol and Brown, "Review of Current Concepts," 47.

⁵⁹ Ralph Tench, Brian Jones, and William Sun, "Introduction," 4.

Mazutis conducted research to understand how companies responded and acted to institutional pressures. Maintaining harmful social and environmental practices become less acceptable. This change leads to new strategic focus areas that need to be considered by companies e.g., extended supply chain responsibility. The output of the research is that the mean CSR adoption levels of companies is relatively low.⁶⁰ It is recognizable that voluntary company efforts have its limits but have a measurable impact.⁶¹ This is underlined by the results of Vogel, who found that most companies want to be one step ahead of the competition in environmental responsibility but not two steps.⁶²

Global climate change and a company's responsibility to improve the current situation by reducing emissions of GHGs is an important dimension in CSR.⁶³ Environmental responsibility is complex and multidimensional.⁶⁴ Businesses need a holistic approach encompassing new business/environment thinking from zero waste to zero carbon emissions. The environmental management role in companies is still underrated compared to quality management and health and safety management.⁶⁵ Adapting to environmental changes can be seen as a necessary condition of company survival. This means that ensuring continual fit between strategy and environmental harm is critical for achieving and maintaining a competitive advantage.⁶⁶ Many companies have embraced beyond pure environmental compliance and created environmental strategies which are proven cost-effective. It has been found that the most promising area for cost-effective environmental programs is within the company's own production processes.⁶⁷

Of all CSR dimensions environmental protection attracted the most attention. Corporate Environmental Responsibility (CER) is always communicated as success – never negative aspects.⁶⁸ Emerging global standards, codes, and principles create an expectation of corporate accountability and transparency. Here, one example is the ISO standard 14001.⁶⁹ The ISO 14001:2004 standard opened the door for carbon leakage because it was only a “tick the box” compliance approach meaning conformity with the standard was in focus only, The latest ISO 14001:2015 standard shifts towards a more creative, open-value, and innovation approach. This means a fundamental shift from control and conformity to achievement and self-direction values. Nevertheless, greenwashing is still a topic.⁷⁰ In addition, Vogel found that still only a few companies systematically monitor the environmental performance of their suppliers.⁷¹ Usually, changes in ISO standards are results of societal pressure.⁷²

⁶⁰ Mazutis, “Much Ado about Nothing,” 182-183.

⁶¹ David Vogel, *The market for virtue*, 133.

⁶² David Vogel, *The market for virtue*, 132.

⁶³ David Vogel, *The market for virtue*, 121.

⁶⁴ David Vogel, *The market for virtue*, 110.

⁶⁵ Sarah Williams, “Can a Values Reframing of ISO14001:2015 finally give Business an effective Tool to tackle Climate Change?,” in *Redefining Corporate Social Responsibility. Developments in Corporate Governance and Responsibility*, ed. David Crowther and Shahla Seifi (United Kingdom: Emerald Publishing, 2018) 17.

⁶⁶ Mazutis, “Much Ado about Nothing,” 178.

⁶⁷ David Vogel, *The market for virtue*, 127.

⁶⁸ David Vogel, *The market for virtue*, 133.

⁶⁹ Mazutis, “Much Ado about Nothing,” 180.

⁷⁰ David Vogel, *The market for virtue*, 138.

⁷¹ David Vogel, *The market for virtue*, 138.

⁷² Mazutis, “Much Ado about Nothing,” 181.

In December 2022, the European council adopted a position on due diligence rules for large companies. The due diligence directive will lay down rules and obligations for selected companies in and outside EU regarding actual and potential impacts on human rights and the environment. The rules will impact a company's chain of activities and will be applicable for upstream and downstream activities. Companies will need to adopt a plan to ensure compliance of their business operations, business model and strategy with the Paris Agreement 2015 on Climate Change.⁷³

2.5. Business Regulation

From a business perspective, business regulation is regarded as any administrative activity that requires some external reporting or documentation by the business to comply with a regulation.⁷⁴ CFE Research on behalf of the Department for Business, Energy & Industrial Strategy (BEIS) conducted a qualitative study to explore companies' view on around regulatory burden in 2019. The results show that business regulation impacts companies very differently and that the perceived administrative burden of compliance with regulation varies depending on company size, regulatory environment, and business sector. Costs for the internal administrative setup, for the infrastructure and equipment are the main obstacles for monitoring compliance within companies.⁷⁵

In June 1982, Braithwaite introduced the concept of government enforced self-regulation⁷⁶. He used the benefits of the theory of self-regulation and added the notion of government monitoring capabilities as an alternative to direct governmental regulation. The advantage of self-regulation include that it achieves greater inspectorial depth because people from the business have greater knowledge where non-compliant behavior is to be found and are more likely to detect and uncover cover-ups of non-compliance. Under enforced self-regulation the company documents its own set of rules tailored to the uniqueness of its business operations and the regulator reviews and approves them. According to Braithwaite this is the strongest method to ensure self-regulation. Based on this principle, a lot of business regulation is in place today. Examples are the EU AEO program, or the proposed CBAM regulation. In both cases, the company needs to document their rules to comply with the program or regulation. Furthermore, it includes monitoring and reporting requirements for the company to the regulator.

⁷³ "Council adopts position on due diligence rules for large companies," European Council, accessed December 27, 2022, <https://www.consilium.europa.eu/en/press/press-releases/2022/12/01/council-adopts-position-on-due-diligence-rules-for-large-companies/>.

⁷⁴ Department for Business, Energy & Industrial Strategy (BEIS) and CFE Reserch, "Business Regulation Understanding business' perceptions and behaviour", *BEIS Research Paper*, no. 024 (2019): 6,

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/840622/business-regulation-understanding-business-perceptions-behaviour.pdf.

⁷⁵ Department for Business, Energy & Industrial Strategy (BEIS) and CFE Reserch, "Business Regulation Understanding business' perceptions and behaviour", *BEIS Research Paper*, no. 024 (2019): 8,

⁷⁶ John Braithwaite, "Enforced Self-Regulation: A new Strategy for Corporate Crime Control", *Michigan Law Review* 80, no. 7 (1982): 1466–1507.

Two decades ago, Braithwaite and Drahos published their book on global business regulation⁷⁷. Reviewing the findings and conclusions of chapter twelve, nearly 23 years later reveals that their conclusions drawn still hold true today. The chapter explores the business regulation around the environment. Major achievements with regards to environmental regulation are the regulation of whaling and the ozone-depletion. Already in the 1990s Porter concluded that enhanced resource productivity can increase competitiveness because of the set of environmental standards companies operate in. Furthermore, the shift from standard compliance to continuous improvement (CI) is emphasized. This means when CI leads corporate practices up, environmental standards will follow. By this, global standards will be raised. For example, in a company, the goal can be to undercut the environmental harm like carbon emissions compared to a specific previous period. Integrating environmental standards into companies' strategic ISO umbrella is an example for a level playing field that over time will lead to a higher-quality field.

In their book, Alemanno et al.⁷⁸ discuss various nuances of business regulation. They commence with the economic justification of regulation and expect that the reams of regulation will only grow soon. They name climate change and financial crises of driving forces for additional regulation because they contribute to the "world risk society". They indicate that institutional efforts to manage risks usually compromise businesses, business' products, and service. Furthermore, they discuss that the justification of and need for regulation has different origins and perspectives: economic perspective, legal perspective, sociological perspective, political perspective, and public administrative perspective. What they all have in common is that regulations that are justified by one of these origins, can be necessary to correct market failures such as environmental risks. Thus, risk-based regulation seeks to repair market failure at lowest possible costs. One major area of risk is named as greenhouse gases and environmental degradation which are a direct effect of individual and corporate consumption. The authors admit that regulation can solve social problems. Nevertheless, the solutions can come with their own problems e.g., compliance costs especially implementation costs.

The different chapters of the book address different aspects of business regulation and aim to create a better portrait of challenges linked with a risk society.⁷⁹ Chapter four starts with a comprehensive picture of the development from the United Nations Framework Convention on Climate Change (1992) via the Kyoto Protocol (1997) to the Copenhagen Accord (2009). The possibility to trade emissions was already embodied in the Kyoto Protocol.⁸⁰ Ayalew and Mulugetta conclude that global legal frameworks only bind states who will therefore enact national laws that eventually affect business directly.⁸¹ The

⁷⁷ John Braithwaite and Peter Drahos, *Global Business Regulation*, (Cambridge: Cambridge University Press, 2000), 256-196.

⁷⁸ Alberto Alemanno, Frank den Butter, André Nijsen and Jacopo Torriti, "Introduction," in *Better Business Regulation in a Risk Society*, ed. Alberto Alemanno et al. (New York: Springer, 2013), 1-4.

⁷⁹ Alberto Alemanno, Frank den Butter, André Nijsen and Jacopo Torriti, "Introduction," in *Better Business Regulation in a Risk Society*, ed. Alberto Alemanno et al. (New York: Springer, 2013), 1-4.

⁸⁰ Mulugeta Mengist Ayalew and Yacob Mulugetta, "The Prospects for Global Climate Change Reform After Copenhagen," in *Better Business Regulation in a Risk Society*, ed. Alberto Alemanno et al. (New York: Springer, 2013), 65.

⁸¹ Mulugeta Mengist Ayalew and Yacob Mulugetta, "The Prospects for Global Climate Change Reform After Copenhagen," in *Better Business Regulation in a Risk Society*, ed. Alberto Alemanno et al. (New York: Springer, 2013), 76.

relevance of chapter four is that international frameworks opened the path for individual climate change laws that include measures to achieve binding goals for the states and countries.

Furthermore, chapter six looks at the costs related to state intervention for the financial sectors. Boonstra and Bruinshoofd explain that the motives for additional costs are well understood but social costs are not understood. They argue that the political discussion on regulatory proposals does not include the benefits and costs of new regulations.⁸² Further on they analyze different cost components of regulatory compliance. On one side, real costs of supervision meaning providing periodic information statements to the supervisor or regulator occur that indicate that their operations and services are compliant with regulations. Another cost component is that regulations may affect the behavior of businesses and their customers or clients. These changes in behavior could impact the stability and functionality of the system.⁸³ The result is that regulations come with cost for businesses in all sectors and these costs are intertwined with different regulations that a company needs to comply with.

Den Butter's chapter 7 provides a distinction between various types of transaction costs. He starts with outlining that the implementation of government regulation brings transaction costs and argues that these costs are often neglected in policy design. Again, he confirms that government regulation is about internalizing externalities such as market failures. In addition, it is recognized that a common characteristic of regulations is that they cause implementation costs. It is further argued that these transaction costs of government regulation are too high and inefficient for certain countries and obstruct economic activity. Especially, administrative burden is mentioned as the major obstacle.⁸⁴ It is further explained that benefits of such regulations are not always directly visible. With regards to benefits, the author also elaborates on the reputational mechanism of complying to environmental standards and refers to the AEO as an example for a government regulation that uses the reputation mechanism.⁸⁵

Chapter eleven written by Vos considers the enforcement activities of the EU with regards to regulations and indicates several problems. The main topic is the EU misses a clear, uniform, and consistent regulation in various business sectors. There are huge differences from highly to less regulated sectors. Due to the setup of the EU, it lacks aligned enforcement and supervisory procedures and thus, cannot regulate in the same way in all member states. This is called cross border barriers.⁸⁶

⁸² Wim Boonstra and Allard Bruinshoofd, "The Costs of State Intervention in the Financial Sector," in *Better Business Regulation in a Risk Society*, ed. Alberto Alemanno et al. (New York: Springer, 2013), 101.

⁸³ Wim Boonstra and Allard Bruinshoofd, "The Costs of State Intervention in the Financial Sector," in *Better Business Regulation in a Risk Society*, ed. Alberto Alemanno et al. (New York: Springer, 2013), 106-107.

⁸⁴ Frank den Butter, "The Perspective of Public Sector Economies on Regulation: Transaction Costs and the Agency Model," in *Better Business Regulation in a Risk Society*, ed. Alberto Alemanno et al. (New York: Springer, 2013), 120.

⁸⁵ Frank den Butter, "The Perspective of Public Sector Economies on Regulation: Transaction Costs and the Agency Model," in *Better Business Regulation in a Risk Society*, ed. Alberto Alemanno et al. (New York: Springer, 2013), 130.

⁸⁶ Joeske Marijke Vos, "From Better to best Regulation: Towards Competitiveness by Cross-Border Consistency", in *Better Business Regulation in a Risk Society*, ed. Alberto Alemanno et al. (New York: Springer, 2013), 174-180.

2.6. Necessary Condition Analysis in other Research Disciplines

Several papers claim that the necessary condition analysis is a suitable research method in various research disciplines like supply chain management, psychology, business research, human resource management and management research.

When comparing journal articles of studies conducted in these named areas, a lot of similarities are visible. Back in 2016, Karwowski et al.⁸⁷ successfully applied the necessary condition method in the field of psychology. They took a new approach with the NCA to re-evaluate the old phenomena of creativity and intelligence. To be more precise, they argue that intelligence is a necessary condition for creativity and the only applicable method to explain this phenomenon is the NCA method and not correlation and regression models. The authors performed several methods to collect data on both variables and applied the NCA using the NCA package in R. The results confirm the theory. Thus, they have proven the generalizability of the NCA method as applicable in psychology research.

More recently, Richter and Hauff⁸⁸ argued that the necessary condition approach is very often referred to in international business (IB) research, but they see a theory-method-fit gap. Thus, they conducted their research to familiarize IB researchers with the correct approach to tackle IB phenomena. In their view the correct method should often be the necessary condition analysis. They call it a powerful tool for IB researchers. Specifically, they found out that a lot of existing IB research refers to necessity theories in research titles but the phenomena on hand were explained using regression-based procedures while NCA would have been the appropriate method. For this, they searched for key words in selected business and management research journals and reviewed the approach taken by other IB researchers. In addition, to underline their argumentation they successfully carried out a necessary condition analysis on foreign direct investment (FDI). For example, they analyzed whether beneficial institutional environments (e.g., not being a war zone) are a necessary location factors for companies.

Similar research was carried out by Bokrantz and Dul⁸⁹ in 2022. The main difference is that they looked at supply chain management (SCM) research. They also looked for research that included key words such as “necessary condition” and “necessary and sufficient condition”. They conclude on the same results. For example, they also found a gap in the method-theory-fit as the methods used to establish evidence about necessary condition were again regression-based procedures. Nevertheless, they found that SCM researchers applied necessity theorizing to various SCM concepts and phenomena.

⁸⁷ Maciej Karwowski, Jan Dul, Jacek Gralewski, Emanuel Jauk, Dorota M Jankowska, Aleksandra Gajda, Michael H Chruszczewski, and Mathias Benedek. “Is Creativity Without Intelligence Possible? A Necessary Condition Analysis.” *Intelligence* 57 (2016): 105–17. <https://doi.org/10.1016/j.intell.2016.04.006>.

⁸⁸ Nicole Franziska Richter and Sven Hauff. “Necessary Conditions in International Business Research-Advancing the Field with a New Perspective on Causality and Data Analysis.” *Journal of World Business* 57, no. 5 (2022). <https://doi.org/10.1016/j.jwb.2022.101310>.

⁸⁹ Jon Bokrantz and Jan Dul, “Building and testing necessity theories in supply chain management,” *Journal of Supply Chain Management* (2022): 1-18, <https://doi.org/10.1111/jscm.12287>

Moreover, Bergh et al.⁹⁰ acknowledge the necessary condition method as a meaningful methodological contribution. In the paper, they recognize that the NCA method has been introduced and is increasingly used in management research. To emphasize how the NCA constitutes a methodological contribution they use a four-stage life cycle concept. Hence, they apply the NCA method to the life cycle method to illustrate that a good methodological contribution's existent can be described in a life cycle from birth (inception) via adolescence (refinement and comparison), maturity (knowledge consolidation and dissemination) to death (displacement). Nevertheless, they do not reference where and when NCA was applied in management research at the time the paper was published.

At last, this advance of the necessary condition method and its relevance to various research methods has already been predicted by Dul et al. in 2010⁹¹. The authors already assumed then that many phenomena were examined using the wrong methodological approach. In their paper, the authors showed how necessary condition hypotheses can be built and tested in different research contexts in operations management (OM). Back then, they already searched for key words in OM literature and evaluated the mathematical modelling approaches in the papers found. The results of the research were similar to the results of recent research. Many OM researcher formulated necessary condition hypotheses but did not test or did not test them correctly. An interesting finding in that paper is that necessary condition statements are important to managers. Managers desire a certain outcome which is success. Thus, a correct necessary condition statement implies that it is critical or essential for managers to ensure that this condition is taken care of. If not, success will not occur. Moreover, the authors acknowledge NCA to be a method fitting case study research.

2.7. Chapter Summary

This chapter provided the literature review. It was shown that trade compliance management is still an underexamined topic although the term trade compliance is heavily used. The structures and operations of multinational companies are becoming more and more difficult, but the compliance function is still seen in its traditional setting as part of the company legal domain. The company view on business regulation is still any administrative activity that requires external reporting. Companies mainly perceive this as an administrative burden. Nevertheless, business regulation is economically justifiable and has various nuances that need to be considered. Environmental regulation and concepts of business regulation have a long history. Corporate Social Responsibility is a very conceptualized and model-based construct which comes in various forms and shapes. It is practiced and perceived differently around the globe, but climate change and environmental protection are common themes. It was found that the necessary condition analysis is a suitable research method for various research domains. Nevertheless, it was not applied properly in past research which is highlighted by studies reviewing preceding research papers.

⁹⁰ Donald D. Bergh, Brian K Boyd, Kris Byron, Steve Gove, and David J Ketchen. "What Constitutes a Methodological Contribution?" *Journal of Management* 48, no. 7 (2022): 1835–48. <https://doi.org/10.1177/01492063221088235>.

⁹¹ Jan Dul, Tony Hak, Gary Goertz, and Chris Voss, "Necessary condition hypotheses in operations management," *International Journal of Operations & Productions Management* 30, no. 11 (2010): 1170 – 1190, <https://doi.org/10.1108/01443571011087378>.

3. Research Methodology

This chapter outlines the research methodology which encompasses a mixed methods approach. Teddlie and Tashakkori call this method the third methodological movement. They argue the paradigm debate between quantitative and qualitative oriented research is leading nowhere. A mixed methods approach is a thriving combination of qualitative and quantitative research methods in one empirical study. Amongst others they characterize mixed methods research by focusing on the research question in determining the methods employed within any given study and as a set of basic “signature” research designs and analytical processes.⁹² In total, three main research steps are carried out. First, necessary conditions are extracted from a legal text using qualitative content analysis methods. These are then tested using a survey which is a method of the quantitative research domain. Second, a single case study analysis of one instance of the research object in a real-life context is performed. Third, an adjustment of an operating design model inspired by value creation models is conducted. These three research steps depict the signature research design of this thesis research.

In addition, desk research was carried out on the empirical research methods to explain the basic principles in the thesis. This is needed to understand why these research methods were chosen and why they are suitable and applicable for this thesis research. This applies amongst others to the case study analysis, the necessary condition analysis, and the value chain model. Mainly qualitative data is analyzed in the research process. As a first step, secondary data next to the carbon border adjustment mechanism regulation itself was collected. Publications and papers already addressing a carbon border adjustment mechanism were considered. This includes publications by the EU commission and other public sources like journals. This is necessary to provide background information like the history and development of the case study object and to emphasize the problem and its context. Keywords for this were to climate change, fit for 55 package and corporate social responsibility. The literature research was conducted using the university online library, and online search engines like Google Scholar.

The focus is on the proposal of the carbon border adjustment mechanism. Nevertheless, one chapter of the thesis is dedicated to other proposed regulations that have a similar impact and nature like CBAM. This chapter reflects comparative legal research to emphasize the importance of the problem that there is supranational law a multinational company needs to somehow comply with in several countries. Lastly, the focus is on the compliance part of the regulation and not on other consequences. For example, it is not investigated how the trading process for the certificates will work or how reporting to the competent authorities will be managed.

3.1. Legal Research

Legal research is needed for this thesis research. It is needed to describe and explain the CBAM regulation by using descriptive and explanatory research methods. It includes why this regulation exists by outlining the causes, motives, and backgrounds. In addition, comparative research is applied to compare the regulation in question with other legal constructs like the proposal on a forced labor ban

⁹² Charles Teddlie and Abbas Tashakkori, "Mixed Methods Research: Contemporary Issues in an Emerging Field," in *The Sage Handbook of Qualitative Research*, eds. Norman K. Denzin and Yvonna S. Lincoln (Los Angeles: SAGE, 2011), 285-287.

and other regulations that are being discussed. For the legal comparative research, CBAM is compared to the regulation proposals on a forced labor ban and deforestation and forest degradation. These were chosen because they are heavily discussed now during functional conferences, webinars, and newsletters. All three regulations were chosen because they are still in the discussion phase and are not yet adopted. Their common theme has to do with sustainability and supply chain due diligence. For the comparison part, all three proposals were read by the researcher first. Afterwards seven common categories were determined that all three regulations have in common. Based on these seven categories, differences and similarities were highlighted and explained. The results are depicted in a table in chapter 4.1.

3.2. Necessary Condition Analysis

In the empirical part, the Necessary Condition Analysis is applied on the legislative text of the CBAM proposal. Normally, NCA would require data to analyze whether the logical argument (X is necessary for Y OR absence of X results in absence of Y) constitutes a necessary condition. For a Necessary Condition Analysis, it is usually the aim to see if one or a few logical arguments constitute a necessary condition. For that purpose, data is gathered. As data on actual shipments is not available and CBAM is not yet in force, the deductive qualitative coding method⁹³ was used to identify necessary conditions in the regulations based on marker and trigger words. In this case, the aim is to derive all necessary conditions from one legal document. As expected, more than one necessary condition was derived from the proposal text.

A first reading of the regulation led to the decision that the word “shall”, in connection with the fact a party should do something, was defined as marker word. Whole sentences were coded expressing either the authorized declarant, the competent authority or customs authority shall do something. Citations where the authorized declarant shall do something where coded as “direct conditions” and where other parties shall do something where coded as “indirect conditions”. The below table depicts the coding guidelines used for the coding in QCAMap.org.

Table 1: Coding Guidelines for NCA

Name	Definition	Anchor examples
RQ1-1: Direct Condition	It is specifically said that the authorised declarant shall do something.	By 31 May of each year, each authorised declarant shall submit a declaration (CBAM declaration), for the calendar year preceding the declaration, to the competent authority.
RQ1-2: Indirect Condition	The authorised declarant needs to do something but it is expressed on behalf of another actor.	The competent authority shall assign to each authorised declarant a unique CBAM account number.
RQ1-3: Commercial Condition	Without the condition the CBAM regulation would not apply to the business.	This Regulation applies to goods as listed in Annex I, originating in a third country, when those goods, are imported into the customs territory of the Union.

Source: Author

Additionally, “Commercial conditions” were coded that were not specific to any of the involved parties, but they were deemed important to be included in the coding. Those coded passages include statements needed in the following process of determining necessary conditions. Without these coded sentences the applicability of the CBAM regulation would not be included in the formulation of necessary condition

⁹³ Udo Kuckartz, *Qualitative Inhaltsanalyse. Methoden, Praxis, Computerunterstützung, 3rd Ed.*, (Basel, Weinheim: Beltz Juventa, 2016) 48.

analysis. Two rounds of deductive coding were carried out in QCAmap to capture all relevant direct, indirect, and commercial conditions.

After coding, all cited sentences were classified into a certain group. In total, seven groups (reporting, penalty, record keeping, application, calculation, certificates, and monitoring) were defined. Based on these groups, all coded sentences were put in a matching order in each specific group. The grouping of the necessary conditions allows the researcher to group the interview questions into separate topics. Coded sentences that were considered to refer to the same topic were combined. Based on this combination, necessary condition hypotheses were formulated either as explicit statements (X is necessary for Y) or implicit statements (X is a prerequisite for Y)⁹⁴. The formulation of the necessary conditions was carried out in the light of the central question “What does the company need to do to comply with the regulation?”. All necessary conditions start with a verb to indicate that there is a task behind every condition. In total, 22 necessary conditions were extracted from the proposal text.

After extracting the necessary conditions, they need to be validated. As data on CBAM impacted shipments and internal processes is not yet available, the validity cannot be tested in the NCA/R tool. Instead, a survey was conducted to assess the validity of the derived necessary conditions. Regarding the timeframe of this research, it was decided to conduct a survey instead of structured expert interviews. This decision was taken to be closer to the actual necessary condition analysis which is more of a black and white approach. The mathematics behind the method are clear and straightforward. Either the proposition depicts a bottleneck, or it does not. Even structured interviews would not have been close enough to this straightforward approach as interviews always leave room for the respondent to add a personal view or to add remarks.

The following questionnaire design process follows the principles of marketing research⁹⁵. First, the survey objective needs to be stated clearly and must be linked to the research question. The expected data generated by the survey is agreement or disagreement with a necessary condition hypothesis. Agreement with a statement means that the statement constitutes a necessary condition in view of the survey participant while disagreement concludes the statement does not constitute a necessary condition. Thus, this survey answers the research sub-question whether there are necessary conditions in the CBAM proposal. In total, 17 respondents participated in the survey. Out of these 17 responses, only six were included in the evaluation of the survey because these respondents indicated that they regularly deal with CBAM or deal with CBAM. The results of the survey are depicted in chapter 5.2. The survey questionnaire is included in appendix 1. The raw data of the survey are shown in appendix 2.

The data collection method is an online questionnaire created with Google Forms.⁹⁶ The questionnaire consists of 24 questions in total. Two questions focus on demographic and classification data. These questions have nominal level of measurement because they have no other meaning than identifying a particular characteristic. This is done to identify the answers from experts of the customs, trade, or supply chain domain. Contributions from other areas of expertise are sorted out. Combinations of these

⁹⁴ Bokrantz and Dul, “Testing necessity theories in supply chain management,” 3.

⁹⁵ Kenneth E. Clow and Karen E. James, *Essentials of Marketing Research: Putting Research into Practice* (Thousand Oaks: Sage 2014), chap. 9, chap. 11.

⁹⁶ <https://www.google.com/forms/about/>

domains are highly appreciated by the researcher. In addition, the professional expertise in years in these domains can play a role as to assess the reliability of the survey participants during the evaluation of the results. This professional experience is requested in an ordinal scale but it is not a mandatory question. The knowledge expressed in a scaled-response format provides data on the degree to which a respondent is knowledgeable about the current Carbon Border Adjustment Mechanism discussion. Here, the knowledge is expressed in an interval scale from “I never heard of CBAM so far” until “I regularly deal with CBAM”. The same applies to the necessary condition concept. Concept knowledge might influence the results.

The main questionnaire itself consists of closed-ended and scaled-response question. Closed-ended questions mean the respondents are given a finite number of responses to choose from. This is done to the limit the interviewer bias and to get easy and accurate data entries. The disadvantage for the respondent will be that he must select an answer from given alternatives. The scaled-response question approach is used to capture the intensity of the response. How much does the respondent agree that this is a necessary condition or not. The researcher chose two points in the interval scale. An even number was chosen to avoid neutral responses (the middle of the scale).

The survey was available online for one month and was shared via LinkedIn, e-mails, and text messages. The responses were extracted in an excel file. From the total of 17 respondents only 6 responses were included in the analysis. It was expected to have at least five useful responses to perform the analysis. Responses were regarded as useful when the respondent indicated they deal with CBAM or regularly deal with CBAM. The aim of the survey was never to get as many answers as possible but to get expert answers for analysis. The raw data of the survey including all respondents is shown in appendix two. The results are shown in a bar chart in chapter 4.2.

3.3. Case study analysis

For this master thesis one part of the research approach is to conduct case study research on the proposed CBAM regulation. The structure of case study research follows the works of Yin⁹⁷, Eisenhardt⁹⁸, Dul and Hak⁹⁹, and Farquhar¹⁰⁰. The book by Farquhar is a secondary source for case study analysis that includes works of Yin and Eisenhardt and provides additional practical explanations to the case study methodology. Thus, it is considered useful to better understand the research approach and depiction as well as generalizability of the findings.

Case study research is a study on one instance (the case) of the object of study in its real-life context. The research relies on multiple sources of qualitative data and includes mainly qualitative methods of analysis. The case study method was chosen as it is said that it is well received by practitioners. Case study research is suitable for exploring something new when there is a need to understand phenomenon

⁹⁷ Robert K. Yin, *Case Study Research and Applications: Design and Methods* (Los Angeles: Sage, 2018).

⁹⁸ Kathleen M. Eisenhardt, “Building Theories from Case Study Research.” *The Academy of Management Review* 14, no. 4 (1989): 532–550.

⁹⁹ Dul and Hak, *Case Study Methodology*.

¹⁰⁰ Jillian Dawes Farquhar, *Case Study research for Business* (London: Sage, 2012), <https://dx.doi.org/10.4135/9781446287910.n2>.

in a real-life context. It can help to study the application of new rules to an industry. This applies to the proposed CBAM regulation. There is uncertainty on what the real impact will be and what it will mean to importers, customs brokers, and other economic operators.

The case study in this thesis is a single case study as the CBAM regulation is a unique phenomenon. Furthermore, including other cases (other regulations) in the necessary condition analysis and later in the internal discussion was not possible in the given timeframe. It would increase the research scope which is not desired. In addition, it allows a deep dive into the carbon border adjustment mechanism to really understand and make visible what is required to comply with the regulation to avoid fines, supply chain disruptions or productions outages. The research is a cross-sectional and retrospective type as the time dimension is not important and the study is limited to the proposal published on July 14, 2021, which is already in the past.

This case study reflects the practical problem in a theoretical phenomenon. The level of analysis is the meso level meaning the company's organization in the EU as the context of the case study. There are two units of analysis. First, the CBAM regulation is studied to understand whether it contains necessary conditions companies need to comply with. Second, it is investigated how the concept of the customs-oriented value chain in connection with necessary conditions can help to lead the internal management discussion. The company needs to comply with the regulation when it comes into force. The discussion is about measures and processes which need to be changed or implemented. To be more precise, the discussion includes which department or organization in the company is the main responsible party to ensure compliance.

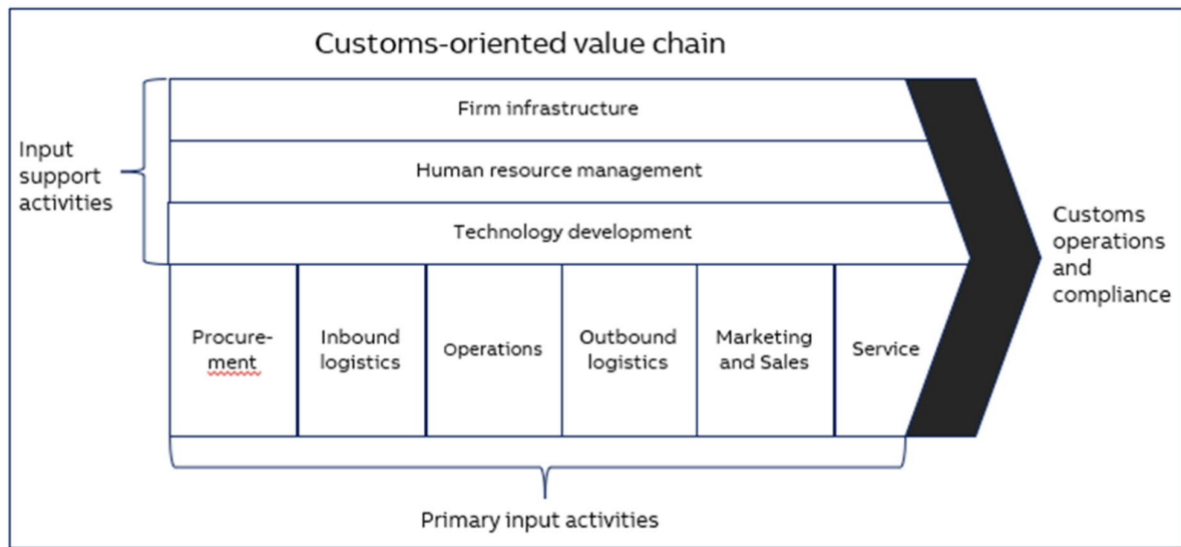
3.4. Customs-Oriented Value Chain Model

To address the research problem's company issue, the customs-oriented value chain model by Amptmeijer is used.¹⁰¹ Amptmeijer used Porter's value chain model which originally is a pure strategic cost management tool¹⁰² and turned it into a tool to identify collaborative activities that enhance the overall value proposition of a company. Her model focuses on those activities which contribute to an efficient, reliable, and thus cost-effective fulfillment of customs requirements along the whole supply chain. In addition, it provides an alternative set of KPIs and measurement standards to enable evaluation of the non-customs department's contributions to customs processes. As CBAM is to be enforced by customs authorities of the member states, it is regarded as a customs process for this part of the analysis. In the model value creating primary activities are replaced by activities influencing the coordination with other parties in the supply chain and which generate data relevant for customs clearance purposes. In addition, secondary activities support the execution of the primary activities. The following figure shows the customs-oriented value chain model.

¹⁰¹ Amptmeijer, "Customs-oriented Value Chain," 47-61.

¹⁰² Porter, "Competitive Advantage", 38.

Figure 1: Customs-Oriented Value Chain Model



Source: Amptmeijer, "Customs-oriented Value Chain," p. 49

This model reflects most customs relevant linkages in the organization. It makes visible required contributions of non-customs departments to the customs process. Furthermore, it can be used to perform a gap analysis of operational practices which then can be used to improve the internal collaboration. Which in turn can be achieved through a variety of measures like enhancement of processes or implementation of support tools.

To visualize possible collaborations between customs and non-customs departments activity tables are created. For this thesis, the activity tables are amended as follows.

Table 2: Exemplary Activity Table

Customs Issue	Root cause identification	Departments involved
XXX	XXX	XXX

Source: modelled after Amptmeijer, "Customs-oriented Value Chain"

Table 3: Amended exemplary Activity Table

Necessary Condition	Data/Collaboration activity	Departments involved
XXX	XXX	XXX

Source: modelled after Amptmeijer, "Customs-oriented Value Chain"

The customs Issue is replaced by the necessary condition because that is the issue where collaboration is needed. The root cause identification is replaced with source/collaboration activity because we need to know which data or collaboration is required between the customs and non-customs departments. In a second stage these activity tables will be re-grouped per department to gain proper understanding of the required contribution in one single overview. This model uses the same sub-activities as the Porter model: direct, indirect, and quality assurance.¹⁰³ The company's operational structure does not match

¹⁰³ Porter, "Competitive Advantage", 44.

entirely with the generic customs-oriented value chain model. To overcome this problem, functional area tables are created to reflect the generic functional categories. An example is shown in the following.

Table 4: Exemplary Functional Table

Functional Area	e.g., Procurement
Roles within the company	<i>Logistics Manager, Sourcing Manager</i>
Attention areas	<i>Product Classification, Customs Valuation</i>
Direct activities	<i>Request full product information from supplier</i>
Indirect activities	<i>Maintain workforce with insight into customs requirements</i>
Quality assurance activities	<i>Actively manage vendors in case of non-compliance</i>
Potential KPIs	<i>Number of times data from supplier was incomplete</i>

Source: modelled after Amptmeijer, "Customs-oriented Value Chain"

To address the implementation part of the research, 8 semi-structured interviews with relevant company stakeholders were conducted. The term "stakeholder" for this thesis research refers to a person or group who has a legitimate interest in the course or outcome of a process or project. Therefore, an interview list was created. To create the interview list, an analysis comparable to a stakeholder analysis is carried out. The analysis indicates who needs to be interviewed and why. In business research, a stakeholder analysis is a three-step process. First, a broad-based consideration of different stakeholder groups, which are assumed to influence the case study analysis takes place. Second, the respective requirements for the identified stakeholders are to be recorded in current terms and in their forecast development. Ideally, these can be outlined using a description. Third, the stakeholders' requirements are to be recorded and classified in terms of their relevance for the study.¹⁰⁴ The following table shows the interview list based on the stakeholder analysis approach. The analysis was carried out by the trade compliance team in an online workshop.

¹⁰⁴ Roland Alter, Strategisches Controlling: Unterstützung des Strategischen Managements (Berlin/Boston: De Gruyter, 2013), 107 – 110.

Table 5: Stakeholder Analysis

Stakeholder / Corporate Area	Description / Role	Interest in CBAM
Procurement Sustainability and Compliance	ensure integration of CSR principles into company's procurement processes and ensure compliance within the procurement function	CBAM addresses environmental problems in supply chains and CBAM is established in the form of a regulation with which a company needs to comply
Supplier Risk Management	identify and mitigate risks to an organization caused by the organization's supply chain	CBAM constitutes a potential threat to the companies' supply chain especially because its uniqueness and novelty
Category Management Castings	manage (purchased) product groups as business units	CBAM encompasses HS code chapters 72 iron and steel, 73 articles of iron or steel and 76 aluminium and articles thereof
Category Management Polymeric	manage (purchased) product groups as business units	CBAM encompasses HS code chapter 39 plastics and articles thereof
Trade Compliance	ensure import and export compliance with laws and regulations	CBAM will be enforced by the national customs authorities
Sustainability	create long-term stakeholder value through implementation of a business strategy focussing on the ethical, social, environmental, cultural, and economic dimensions of doing business	CBAM addresses environmental problems in supply chains and forces companies to manage their global carbon footprint. Sustainability is crucial for the company's business operations
Finance	plan, develop and control the capital structure of a business	CBAM requires company to buy CBAM certificates in advance at the EU ETS
Transportation	handle and understand how goods are moved throughout the supply chain and all modes of transportation therein	CBAM affects goods in all modes of transportation and without a CBAM management CBAM goods can no longer move through the supply chain

Source: Author

These functions were chosen because they represent related areas of work. The process owning function for CBAM has not yet been identified. This list of participants has also been chosen to capture and represent various perspectives in business operations. In addition, participants rank differently in the company hierarchy from vice president to operational manager. CBAM is not yet a well-known topic. A frequently asked questions (FAQ) document addressing the basic known facts about CBAM was created and distributed among the participants to give them a first introduction to the topic. Then, an online meeting was scheduled to further discuss the current knowledge level of CBAM and to clarify questions before the interviews. This meeting was recorded, and comments made by the participants were included in the analysis.

To assess the potential impact of the carbon border adjustment mechanism on business operations of European importing companies of the company for this research data was collected. The researcher collected previous calendar year's data from the main manufacturing locations within the EU. The data reflects imported items based on their HS codes which in future will be subject to CBAM, number of imports of these items, quantities of these items in the import declaration and imported values. Due to confidentiality these numbers cannot be presented in this research report. What can be shared is CBAM will apply for more than a thousand import shipments a year. The imported values are in the two-digit

millions. All main manufacturing locations will be impacted by CBAM. At some locations the impact will be bigger than at others.

To conduct the interviews an interview guide was created. It is available in appendix 3. The interview guide lists questions and topics that are intended to elicit responses contributing to the research question. The interview guide was reviewed after the first two interviews. Smaller changes were made to the first version. The order of questions was changed, six questions were deleted, and three questions were added. All interviews were conducted via Teams and recorded. The transcription of the recording was done with Teams. The deductive coding was carried out in QCAmap. The category “miscellaneous” was created to capture remarks from components which are not directly linked to a necessary condition but are being regarded valuable for the analysis. For simplification purposes only the categories for necessary conditions were used instead of mentioning all extracted necessary condition in the coding guidelines. This is aligned with the interview guide which is also based on the groups and not on each individual necessary condition. QCAmap does not allow for hybrid coding techniques. This is why the additional category was created. The coding guidelines are shown in the following table.

Table 6: Coding Guidelines Interviews

Name	Definition	Anchor examples
RQ2-1: Reporting	All necessary conditions grouped under reporting purposes.	The CBAM declaration is issued to the competent authority on March 31 every year.
RQ2-2: Penalty	Necessary Conditions that are grouped under penalty.	A certificate of origin is requested from suppliers for every CBAM import to prevent circumvention of the regulation.
RQ2-3: Record Keeping	Answers to necessary conditions grouped under record keeping.	The record keeping requirements need to be added to the global record keeping policy.
RQ2-4: Application	Answers to necessary conditions grouped under application.	Function x applies with the competent authority to become an authorized declarant.
RQ2-5: Calculation	Answers to necessary conditions grouped under calculation.	The calculation will be based on the default values.
RQ2-6: Monitoring	Answers to necessary conditions grouped under monitoring.	CBAM imports will be subject to a specific post entry review.
RQ2-7: Miscellaneous	All other remarks made by the respondents that are not linked to a necessary condition.	We need to rethink compliance management.
RQ2-8: Process Owner	Answers to the questions around process ownership	shared responsibility, central team

Source: Author

From the interview results, the activity tables are created for the company to ensure supply chain compliance with the proposed carbon border adjustment mechanism and to be prepared before the regulation enters into force. The coded passages were sorted by code. Then, the passages were analyzed for data, collaboration activities and functions stated by the interviewees.

3.5. Chapter Summary

This chapter described the research methodology for this thesis research. The mixed methods signature approach for this research was outlined. Each individual research method and the linkages between them for this study were depicted. It was shown how the necessary conditions were extracted from the legal text. Moreover, the structure of the case study analysis was shown, and it was outlined how the customs-oriented value chain model is adapted to achieve collaboration in the company supply chain to prepare for the carbon border adjustment mechanism.

4. Research Results and Analysis

This chapter provides the results for the empirical part of the thesis. It starts with a comparison of the case study object to other legislative proposals of the EU. This adds to the generalizability of the research approach and emphasizes the importance of literature findings especially on CSR. In addition, this chapter outlines the results of the survey conducted to verify the correctness and applicability of the derived necessary conditions. Next, the results of the semi-structured interviews are presented and combined with the customs-oriented value chain approach.

4.1. Comparison of CBAM to other Regulations

In the following sub-chapter descriptive and comparative legal research was applied. The aim of this sub-chapter is to uncover similarities and differences of three legal constructs at the same state level (EU regulation). Therefore, it is essential to describe the law as a first step. A descriptive research objective is always to be followed by another legal research objective.¹⁰⁵

In the following, two other proposals for regulations will be compared to the CBAM proposal. One is also linked to the EU Green Deal. What these three proposals for a regulation have in common is they have an impact on a company's supply chain due diligence and CSR. Next, the two other proposals for a regulation will be introduced.

On November 17, 2021, the European Commission published the proposal for a regulation on the making available on the Union market as well as export from the Union of certain commodities and products associated with deforestation and forest degradation and repealing Regulation (EU) No 995/2010. The aim of this proposal is to make supply chains deforestation-free. Thereby the EU will help to stop deforestation and forest degradation across the globe. In addition, greenhouse gases will be reduced, and biodiversity increased.¹⁰⁶

On September 14, 2022, the European Commission published the proposal for a regulation on prohibiting products made with forced labor on the Union market. This comprehensive approach is needed because still millions of people are in forced labor globally. This proposal does not only address forced labor alone but also targets core labor standards.¹⁰⁷

The European Commission has issued all three legislative proposals in the form of a regulation. If the proposals are adopted, they will be directly applicable in all EU member states and will not need to be transposed into national legislation. Regulations are the most powerful forms of EU law. All three proposals follow the structure provided for in the Treaty of Lisbon 2007. This means the proposals will serve as a basic regulation. To make the regulations workable the Commission will need to adopt

¹⁰⁵ Lina Kestemont, *Handbook on Legal Methodology: From Objective to Method* (Cambridge: Intersentia, 2018) 9-13.

¹⁰⁶ "Green Deal: EU agrees law to fight global deforestation and forest degradation driven by EU production and consumption," European Commission, accessed January 3, 2023, https://ec.europa.eu/commission/presscorner/detail/en/ip_22_7444.

¹⁰⁷ "Commission moves to ban products made with forced labour on the EU market," European Commission, accessed January 3, 2023, https://ec.europa.eu/commission/presscorner/detail/en/IP_22_5415.

delegated and implementing acts to elucidate the basic regulation.¹⁰⁸ All three proposals make reference to both implementing and delegated acts. For example, in CBAM it is mentioned in article two and article 29. In the deforestation proposal it is mentioned in article 27 and 33 while in the forced labor ban proposal it is also mentioned in article 27 and article seven. The treaty of Lisbon changed the way the Union exercises its powers by creating the current institutional set-up. One of these powers is exclusive competence where the Union can legislate, and member states only implement.¹⁰⁹

In general, all three proposals address externalities that happen outside of the EU territory. The regulations would apply to EU member states and operators who make available or put products on the Union market, but the actual impact is outside EU. These regulations will show and raise awareness to what is happening outside EU. Nevertheless, there are some differences in the impacted territories outside EU. CBAM excludes imports from certain countries. These countries could be called the “carbon club”. The carbon club is depicted in Annex II to the basic regulation. According to article 290 TFEU the Commission is allowed to add more countries or country groups to the carbon club. The carbon club consists of countries participating in the EU ETS. The deforestation proposal does not mention any specific territories or countries to be excluded from the application. Article 3 defines conditions to be fulfilled to place or make available products on the Union market, but it does not exclude or specify any exceptions of countries or country groups. Also, it is irrelevant whether deforestation is legal in the country of origin or production. The forced labor ban proposal also does not exclude countries or country groups from the applicability. Article 3 prohibits to place or make available products on the Union market which are made with forced labor. Exporting these products from the EU customs territory is also in scope of the regulation.

With regards to the products in scope of the proposed regulations, both CBAM and deforestation list the product in an annex to the regulation. The products in scope are identified based on their harmonized system (HS) code usually on the fourth but also up to the sixth digit level. This makes the supervision process for the enforcement agency straight forwards and easy. Based on the HS codes used in the entry summary declaration they can perform their risk assessment and eventually stop and inspect incoming shipments at the EU border. In contrast, the forced labor ban encompasses all products which are not closer specified. Authorities shall adopt a risk-based approach in assessing the likelihood whether products were made with forced labor (article 4). Moreover, substantiated concern (article 5) will lead to investigations of potential breaches of the regulation by the operator. Risk-based could mean for example to inspect products originating in Xinjiang, China.¹¹⁰

All three legislative proposals require economic operators to perform or enhance their current supply chain due diligence. In the CBAM proposal this is not explicitly mentioned but it is necessary to understand for which shipments CBAM certificates and reporting requirements apply. This is an indirect

¹⁰⁸ Jean-Michel Grave, “The Impact of the Lisbon Treaty on Customs Matters: A Legal Assessment,” *Global Trade and Customs Journal* 5, no.3 (2010): 107.

¹⁰⁹ Timothy J. Lyons, *Eu Customs Law* Third ed. (Oxford Eu Law Library. Oxford: Oxford University Press, 2018), 130.

¹¹⁰ “U.N. expert concludes ‘forced labour’ has taken place in Xinjiang,” Reuters, accessed January 4, 2023, <https://www.reuters.com/world/china/un-expert-concludes-forced-labour-has-taken-place-xinjiang-2022-08-18/>.

need for due diligence across the supply chain. On the contrary, the forced labor proposal in article four requires economic operators to carry out due diligence in relation to forced labor in accordance with applicable legislation. Due Diligence should be carried out by due diligence guidelines or recommendations of the UN, ILO, OECD, or other relevant international organizations. The deforestation proposal goes even one step further and requires a Due Diligence Statement for each import which must be mentioned in the import declaration (article 4 (2)). Article eight defines the need to carry out due diligence for all relevant products but per every supplier. Thus, it is not enough to perform the due diligence analysis based on the products. It is necessary to analyze each supplier and supply chain individually.

What all three proposals have in common is that customs authorities of EU member states act as the enforcement agency. For CBAM this is mentioned in article 25, in deforestation it is in article four and for the forced labor ban this is shown in article 15. This means that all three legislative proposals will become a trade compliance topic after their adoption. They will all be enforced by customs. It shows that the need to collaborate internally with other functions is essential for trade compliance to prepare for the future.

The effect of regulations will have some commonalities and differences. All three have in common that products cannot be put on the Union market when they do not fulfill the requirements. CBAM will require companies to be an authorized declarant (article 4) to import CBAM goods into the customs territory of the Union. The deforestation regulation prohibits importation when the goods do not comply with article three and the forced labor ban requires compliance with article three as well. CBAM introduces a levy on imports of certain products and basic materials based on the emissions embedded in them. For products mentioned in the deforestation proposal it needs to be ensured and proven that covered products have not been produced on land that was subject to deforestation or forest degradation. Here, no additional duties apply but the importer needs to have the Due Diligence Statement in place for each shipment. That will lead to additional costs and efforts for companies. The forced labor ban proposal can be regarded as having the least effect on everyday operations. Supply Chain Due Diligence must be carried out but is only required when the enforcement agency questions the forced labor free origin of the products. Thus, it will be up to the companies to decide when they will perform and document their due diligence process.

All three legislative regulations are currently in the proposal phase and are not in force yet. As they pass through different institutions of the EU, changes and amendments are brought up and included or disregarded in the process. With regards to CBAM, it is already known that indirect emissions in addition to direct emissions will be included in the next legislative proposal text as well as the products in scope will be increased. The same is true for the deforestation proposal. Here, it is also possible to add and expand the scope to other woodland or products. As the forced labor ban proposal has a very broad scope meaning all products from all countries outside EU it would be very difficult to extend the scope. Nevertheless, the scope of a companywide due diligence requirement could be included. The EU already proposed a "Corporate Sustainability Due Diligence Directive" in February 2022 to identify, prevent, mitigate, and account for actual and potential adverse impacts on human rights, including labor

rights and the environment along global supply chains.¹¹¹ The following table summarizes the similarities and differences between the three proposals.

Table 7: Comparison of CBAM to other proposals

	Carbon Border Adjustment Mechanism	Global Deforestation and Forest Degradation	Forced Labour Ban
Legislative Type	Regulation	Regulation	Regulation
Impacted Territory	3rd Country (outside EU territory) except "carbon club"	3rd Country (outside EU territory) regardless of whether it is legal or illegal in this country	3rd Country (outside EU territory)
Product Scope	Iron and Steel, Cement, Fertilizer, Aluminum, Electricity Generation, Organic Chemical, Plastics, Hydrogen, Ammonia	Palm Oil, Cattle, Soy, Coffee, Cocoa, Timber, Rubber, and Derived Products (such as Beef, Furniture, or Chocolate)	All Products - no constraints
Requirement for Supply Chain Due Diligence	Declare embedded emissions in those goods imported into the EU	Ensure and prove that covered products have not been produced on land that was subject to deforestation or forest degradation	Detect forced labor in supply chain to combat and eradicate forced labour from value chains
Enforcement Agency	Customs Authorities of Member States	Customs Authorities of Member States	Customs Authorities of Member States
Effect	Additional tax at importation	Products cannot be put on market or exported	Withdraw products from market, prohibit to place on market by authorities
Development Plans	Include indirect emissions in addition to direct emissions	Scope could be expanded to other woodland	Mandatory horizontal due diligence legislation

Source: Author

This comparative research analysis shows many similarities and differences between these three legislative regulation proposals. The most important contribution of this analysis is that all proposed regulations will be enforced by the customs authorities of the member states. Thus, they will all be addressed to a company’s trade compliance function. Second, they all bring up new supply chain due diligence requirements for companies. Therefore, a comprehensive company approach is needed to

¹¹¹ "Commission moves to ban products made with forced labour on the EU market," European Commission, accessed January 3, 2023, https://ec.europa.eu/commission/presscorner/detail/en/IP_22_5415.

comply with the regulation requirements. Third, two out of three proposals use the harmonized system code to identify products covered by the regulation. For this purpose, correct product classification and documentation is key to show and prove compliance with the regulations. Last, all three proposals regulate operations in the EU but actual the output is to show and emphasize what happens outside the EU. Hence, these regulations will not only impact EU companies but also companies and other countries around the globe. For example, South Korea already announces a response to the CBAM regulation. South Korea will mostly be impacted through its steel exports to the EU where in the production process a lot of carbon dioxide is emitted. The country plans to deal with the impact by further developing carbon reduction technologies.¹¹²

4.2. Results of the Necessary Condition Analysis

In total, 22 necessary conditions were extracted from the proposal text. All necessary conditions were divided into seven groups (reporting, penalty, record keeping, application, calculation, certificates, and monitoring). This shows there are many obligations a company must fulfill when they plan to continue to import CBAM goods from a third county. This also shows that a comprehensive review of the business operations is needed to assess the potential impact of CBAM on the business.

The grouping of the necessary conditions shows that general company processes and CBAM specific process are in scope. For example, record keeping is not a unique business process to CBAM. Record keeping requirements apply to various documents such as tax or business accounting related documents. In most countries there are laws which regulate record keeping requirements or these requirements are included in separate laws. Another example is the reporting group. Reporting requirements can be found in various compliance cases. In the customs domain, the authorized economic operator (AEO) is a good example for reporting. The company needs to regularly report to the customs authority on their financial stability, changes to the management, or changes to operational processes which relate to the AEO. The calculation group for example is unique to CBAM. Here, embedded emissions need to be calculated.

This comparison shows that the CBAM regulation itself is not entirely new and unique. It encompasses various principles that can be found in other regulations or business areas as well. The adjustment mechanism itself is the novelty and that all companies importing CBAM goods are impacted. The following table shows the groups and the corresponding necessary conditions.

¹¹² “South Korea Initiating Response to EU's Carbon Border Tax,” Business Korea, accessed January 4, 2023, <http://www.businesskorea.co.kr/news/articleView.html?idxno=106802>.

Table 8: Necessary Condition Hypotheses in CBAM proposal

Group	Necessary Condition Hypothesis
Reporting	Ensuring that a CBAM declaration is submitted yearly to the competent authority is necessary to comply with the regulation.
	Assuring that all relevant shipments including shipments under special customs procedures are included in the CBAM declaration is necessary to comply with the regulation.
	Analyzing where carbon tax was paid in the country of origin of the goods listed in Annex I is necessary to reduce the number of certificates to be surrendered.
	Verifying that required CBAM certificates are surrendered on a yearly basis is a prerequisite to comply with the regulation and to file a complete CBAM declaration.
	Ensuring that a CBAM report is submitted per quarter to the competent authority is necessary to comply with the regulation.
	Making sure that the competent authority reimbursed the authorised declarant for surrendered CBAM certificates is necessary to reduce the financial impact of the purchase of CBAM certificates
Penalty	Ensuring that all required CBAM certificates have been surrendered is a necessary condition to avoid penalties.
	Implementing measures to detect circumvention practices related to CBAM impacted shipments is necessary to ensure that no violation of the regulation occurs in the business.
Record Keeping	Defining which records the authorised declarant keeps is a prerequisite to fulfill the record keeping requirements.
	Ensuring that adequate documentation in accordance with the regulators requirements is stored is necessary to comply with the record keeping requirements.
	Safeguarding that no records are destroyed before the end of the retention period outlined in the regulation is necessary to avoid penalties.
Application	Demonstrating to be in a good economic state without infringements of customs and tax legislation is a prerequisite for the application to become an authorised declarant.
	Classifying all products into the harmonized system of the World Customs Organization is necessary to assess which imports will be subject to carbon taxation under the CBAM regulation.
	Analyzing where the company is buying goods in third countries is necessary to assess which imports will be subject to carbon taxation under the CBAM regulation.
	Ensuring that the applicant is established in the European Union is a necessary condition to become an authorized declarant.
	Applying to become an authorised declarant is necessary to avoid supply chain disruptions because of non-compliance with the regulation.
Calculation	Requesting data on carbon emissions from tier 1 and (at minimum) tier 2 supplier is necessary to carry out the embedded emission calculation when you import complex goods (goods not produced from raw materials).
	Requesting data on actual emissions per shipment from the supplier is necessary to calculate the embedded emissions in the shipment.
	Using default values for carbon emissions is necessary to perform the calculation when actual emission data is not available.
	Buying CBAM certificates at the EU Emission Trading System (ETS) is necessary to import goods listed in Annex I of the regulation.
	Determining the country of origin for all goods listed in Annex I of the CBAM regulation based on EU country of origin rules is necessary to assess the applicable country of origin of imported goods.
Monitoring	Monitoring all CBAM impacted shipments is necessary to govern CBAM related internal company processes.

Source: Author

The survey to verify the necessary conditions was available online for one month and was shared via LinkedIn, e-mails, and text messages. Six respondents indicated they deal with CBAM or regularly deal with CBAM. Six qualitative responses exceeded the expected five valuable responses. The aim of the survey was never to get as many answers as possible but to get expert answers for analysis. Five qualitative answers have been the set as target. The following figure shows the results for these six respondents only. The raw data of the survey including all respondents is shown in appendix two.

In general, the survey's results express agreement with the NCs. Only twice the respondents expressed they do not agree with a necessary condition. In both cases, two responses agreed with the statement being a necessary condition and four responses disagreed. But only one statement was excluded from the ongoing analysis. The respondents state it is sufficient but not necessary to ensure the company gets reimbursed for surrendered CBAM certificates by the competent authority. This statement is excluded from the analysis. The responses show it is sufficient but not necessary to request data on actual emissions per shipment from the supplier to calculate the embedded emission in the shipment. This statement remains in the analysis because a linked statement does show discord in the answers.

Discord or disagreement is visible for two statements. Here, there is a tie between the six respondents. One of these statements is linked to the emissions calculation. It is true that in the absence of actual emissions standard values which will be made public can be used for the calculation. Nevertheless, with regards to cost saving initiatives this statement must be reviewed in the interviews as a potential "commercial necessary condition". This is why both statements about emissions calculation stay within the scope. The other tie is the question is it necessary to ensure a CBAM report is submitted on a quarterly basis. It will be seen whether the competent authority will request and review these quarterly reports.

In six cases, there are four responses in agreement with the statement and two responses in disagreement. In eight cases, five respondents agree with the statement being a necessary condition and only one respondent disagrees. In four cases, all six respondents agree the statement constitutes a necessary condition. This rating does not reveal anything about the ranking just because all respondents agree. Necessary conditions do not follow a hierarchy. If one necessary condition is not followed, compliance with the regulation will not be given. Thus, complete agreement does not indicate anything about the importance of this necessary condition to the overall success.

Figure 2: Necessary Conditions Survey Results



Source: Author

These findings show qualitative results because the responses were made by people with limited knowledge. Knowledge is limited because CBAM is not in force yet. Hence, all replies might not reflect reality. They are based on expertise and expert knowledge. The responses included in the analysis were selected from responses which indicated the respondents work in the international trade world.

The necessary condition analysis method normally requires data to be analyzed. It can be assumed a calculation would have led to different results. Nevertheless, the results are sufficient for this thesis. Usually, management decisions are based on or influenced by data. The results show that necessary conditions can be found in the CBAM proposal. Thus, the survey results depict data that can be used

for management decisions. To limit researcher bias coding principles were followed in phrasing the statements.

In standard legal research the relation between strict legal duties is examined. It is analyzed whether all extracted duties need to be fulfilled or whether there are possible alternatives. In necessary condition research there are no alternatives possible. All conditions must be met. Otherwise, they would not constitute a necessary condition.

Businesses define business regulation as any administrative activity that requires some external reporting. This is the result of a survey outlined in the literature review. The administrative burden for CBAM will vary from company to company. Not all businesses will be affected the same way as some companies have more imports of CBAM goods than others. Nevertheless, all companies importing CBAM goods will have to do some external reporting namely the CBAM declaration and the quarterly CBAM reports. The costs for compliance will vary between the companies affected by CBAM. The survey showed differences in costs spent on infrastructure and equipment used for monitoring purposes. CBAM also requires companies to monitor their shipments as well. This leads to costs for the implementation or changes for a monitoring system including infrastructure and equipment.

The proposed regulation is an example of the enforced self-regulation model. The necessary conditions show that self-regulation by the company is required, and government monitoring is also applicable. For example, the companies need to surrender leftover CBAM certificates on a prescribed due date. Failure to surrender leftover certificates will lead to a penalty. The authorities require CBAM declarations and quarterly CBAM reports. These reports will be used to assess whether the company surrendered all necessary certificates. Moreover, the CBAM declaration is a government supervision tool to monitor the company's CBAM activities. Boonstra and Bruinshoofd claimed the political discussion on regulatory proposals does not include the costs of new regulations. This is also true for the CBAM proposal. The companies face additional costs for monitoring and supervision activities, but the regulator does not address this topic.

4.3. Results of the Customs-Oriented Value Chain Approach

In the following paragraph, the activity tables for each group of necessary conditions are shown. The required data elements, the collaboration activities, and the involved functions stem from the interviews. All information collected from the interviews are included. At this point there is no allocation between a data element or collaboration activity with a function. This is due to the fact that each interviewee had its own view on a potential future setup and there is no consensus at the moment. In the table none of the data entries are in a certain order. The order stems from the coded passages analysis.

Table 9: Activity Table for Reporting

Group	Necessary Condition Hypothesis	Data / Collaboration Activity	Departments Involved
Reporting	Ensuring that a CBAM declaration is submitted yearly to the competent authority is necessary to comply with the regulation.	- Embedded emissions - CO2 by part	- Master Data - Purchasing - Customs Broker - Transportation
	Assuring that all relevant shipments including shipments under special customs procedures are included in the CBAM declaration is necessary to comply with the regulation.	- Customs broker reports - HS Code - Country of Origin	
	Analyzing where carbon tax was paid in the country of origin of the goods listed in Annex I is necessary to reduce the number of certificates to be surrendered.	- EORI Number - Direct material receipts in ERP - Supplier Invoices	
	Verifying that required CBAM certificates are surrendered on a yearly basis is a prerequisite to comply with the regulation and to file a complete CBAM declaration.	- Shipping documentation - Supplier shipping location	
	Ensuring that a CBAM report is submitted per quarter to the competent authority is necessary to comply with the regulation.	- Full automation - Digitlization of import process - Collect and store data in a central repository	

Source: Author

Table 10: Activity Table for Penalty

Group	Necessary Condition Hypothesis	Data / Collaboration Activity	Departments Involved
Penalty	Ensuring that all required CBAM certificates have been surrendered is a necessary condition to avoid penalties.	- Delegation of Authority - Strong process - Accurate and qualitative business records - Classification records reports - System	- Sourcing - Trade Compliance - independent from other functions - no conflicts of interest
	Implementing measures to detect circumvention practices related to CBAM impacted shipments is necessary to ensure that no violation of the regulation occurs in the business.	- Internal Review - Internal Audit - Awareness Training - Control Mechanisms - Checkpoints - Internal Controls	

Source: Author

Table 11: Activity Table for Record Keeping

Group	Necessary Condition Hypothesis	Data / Collaboration Activity	Departments Involved
Record Keeping	Defining which records the authorised declarant keeps is a prerequisite to fulfill the record keeping requirements.	- Debit and credit of CBAM certificates - Supplier invoice - Classification path - Long-term declarations - Country of origin certificates - Import declaration - Airway bill / bill of lading - Packing lists - Calculations of the embedded emissions - HS codes - Statistics - Delivery notes - Customs documents - Tonnage - Material composition - Supplier location	- Trade Operations - Site that utilizes these documents/data
	Ensuring that adequate documentation in accordance with the regulators requirements is stored is necessary to comply with the record keeping requirements.		
	Safeguarding that no records are destroyed before the end of the retention period outlined in the regulation is necessary to avoid penalties.		

Source: Author

Table 12: Activity Table for Application

Group	Necessary Condition Hypothesis	Data / Collaboration Activity	Departments Involved
Application	Demonstrating to be in a good economic state without infringements of customs and tax legislation is a prerequisite for the application to become an authorised declarant.	- Customer demand - Inventory Levels	- Planning - Procurement - Legal - Trade Compliance - Trade Operations - Sustainability - Centralized function
	Classifying all products into the harmonized system of the World Customs Organization is necessary to assess which imports will be subject to carbon taxation under the CBAM regulation.	- AEO certification - CO2 related data - CDP program	
	Analyzing where the company is buying goods in third countries is necessary to assess which imports will be subject to carbon taxation under the CBAM regulation.	- Classify the materials - Use AEO certification, experience and relationship with customs	
	Ensuring that the applicant is established in the European Union is a necessary condition to become an authorized declarant.	- Any operation site - Every legal entity - Multiple legal entities in Europe	
	Applying to become an authorised declarant is necessary to avoid supply chain disruptions because of non-compliance with the regulation.	- Importing entities - Manufacturing entities - Some commercial teams - Each entity that deals with customs - Centralizing importation of CBAM goods - One facility for Europe	

Source: Author

Table 13: Activity Table for Calculation

Group	Necessary Condition Hypothesis	Data / Collaboration Activity	Departments Involved
Calculation	Requesting data on carbon emissions from tier 1 and (at minimum) tier 2 supplier is necessary to carry out the embedded emission calculation when you import complex goods (goods not produced from raw materials).	- Real CO2 emissions - Default values for CO2 emissions - Annual volumes of potentially affected goods	- Treasury - Accounting - Procurement - Strategic Purchasing - Purchasing - Inventory Management - Import Team - Supply Chain
	Using default values for carbon emissions is necessary to perform the calculation when actual emission data is not available.	- Amount of certificates - CDP reports	
	Buying CBAM certificates at the EU Emission Trading System (ETS) is necessary to import goods listed in Annex I of the regulation.	- Approve the purchase of certificates - Use real emissions to keep company accountable for our sustainability program - Start with a transition phase in which default values will be used	
	Determining the country of origin for all goods listed in Annex I of the CBAM regulation based on EU country of origin rules is necessary to assess the applicable country of origin of imported goods.	- Parallel review of real embedded emissions - Calculate the financial difference for embedded emissions values - Forecast annual volumes - Purchasing process - Receive emission data from CDP reports	

Source: Author

Table 14: Activity Table for Monitoring

Group	Necessary Condition Hypothesis	Data / Collaboration Activity	Departments Involved
Monitoring	Monitoring all CBAM impacted shipments is necessary to govern CBAM related internal company processes.	<ul style="list-style-type: none"> - CBAM certificates - Management reports - Classification and country of origin data - Real embedded CO2 emissions - Default value table for embedded emissions - Import documentation - Statistics, ERP data - Supplier invoices - Manage CBAM certificates as an commodity or asset - Automation of processes and data analysis - Ensure classification and origin data is correct - Establish red flag process comparable to outbound sanctions process - Understand what products are being imported - Rigorous tracking of import shipments - Analyze default values compared to real embedded emissions reported - Random Sampling - ERP integration - Incorporate monitoring into existing monitoring processes 	<ul style="list-style-type: none"> - Legal - Finance - Trade - Compliance - Sustainability - Procurement - Master Data - Supplier Risk - Sourcing - Transportation - Operations - Planning

Source: Author

Given the knowledge about the regulations and the missing delegated and implementing acts, the approach cannot provide the full picture. It allows further insights into upcoming problems and tasks that the company needs to deal with. This is not a comprehensive overview of all compliance tasks. It is only a small portion for what is known so far and what is expected by the interviewed people and their knowledge, but it clearly shows which functions need to collaborate and indicates which data need to be collected. This overview also provides the possibility to perform a gap analysis between the current state of the organization and the to-be state outlined in the tables. For example, digitalization of records and data is a big topic qualifying for a gap analysis among the various locations in the EU.

The next step in the analysis is grouping contributions into the customs-oriented value chain meaning the functional tables. The complexity and the overall company structure do not allow an exhaustive mapping of all functional tables. The full set of functional tables would be part of the guidance submitted to the senior leadership team. This guidance is unique to the company and therefore cannot be shown here. Hence, only the functional table for the trade compliance function is shown in the following. The trade compliance organization is central to this thesis research. For this research, one part of the problem is CBAM might be seen as a trade compliance problem because customs is the enforcement agency. The functional table shows which estimated activities to comply with CBAM may belong to the trade compliance function.

Table 15: Functional Table for Trade Compliance

Functional Area	Trade Compliance
Roles within the Company	Director Trade Compliance, Manager Trade Compliance, Trade Compliance Official
Attention Areas	Monitoring, Internal Audit, (Awareness) Training, Application with Customs
Direct activities	- write/amend policy - setup monitoring framework - conduct audits - provide (awareness) training
Indirect activities	- establish red flag process comparable to outbound sanctions process - use AEO certification, experience and relationship with customs - support application process
Quality Assurance activities	- ensure classification and origin data is correct - review business records during audits
Potential KPIs	- Number of times business records were not complete - Number of times CBAM reports and declarations were not provided on time

Source: modelled after

The creation of the remaining functional tables and updating the model would be an ongoing project as more and more facts about CBAM get published until the transitional period starts. Moreover, during the transitional period amendments to the model need to be made as issues and problems become visible in the company or the EU changes e.g., CBAM requirements.

Regarding the process ownership and therefore the project lead is proposed to be with trade compliance. When asking the respondents about the process ownership trade compliance and sustainability were named most often. Many times the respondents did not want to decide between the two functions. The process owner in this regard would not own and run all the related internal processes. Only one function should have overall responsibility. In general, compliance with CBAM is regarded as a mixed or cross-functional effort. Various functions in the organization need to collaborate to ensure compliance with the regulation. This also becomes visible when reviewing the last column in the activity tables. Thus, during the interviews it has been proposed to establish the function of “Chief Trade Officer” (CTO) which encompasses far more than customs, export control, and sanctions compliance. This function should also incorporate supply chain due diligence and sustainability requirements. It is in line with the view many external consultants share on the need to address international trade risks at the C-level of companies which has been discussed during the literature review.

During the interviews several side remarks were made by the interviewees. These were coded under the miscellaneous code and are listed in the following.

- The data collected for the preparation of the interviews which was shown during the introduction meeting was regarded as too low by some of the involved people. During the interviews we found potential explanations for this. For example, there are castings which are in a higher production state (meaning a higher HS code) and therefore are not impacted by CBAM yet as CBAM focuses on basic materials for now. In addition, in many cases the company’s suppliers import raw castings and pipes from a third country and perform some value adding processing in the EU. This might be why the number of imports is lower than expected.

- The need to find a mechanism to understand the sustainability impact or the environmental impact of the company has been brought forward. It was acknowledged that reputation is the company's biggest asset when it comes to sustainability. Every non-compliance or if something goes wrong related to GHGs emission would impact the sustainability credibility.
- In some interviews it was highlighted to anchor compliance with CBAM in several other places than business processes only. Internally compliance with CBAM should be made part of job descriptions, goal setting, and the corporate code of conduct. Externally, compliance with CBAM should be included in the supplier code of conduct and purchasing guidelines. Here, during the interviews it was admitted that so far, the company did not involve compliance experts into sourcing decisions and strategies.
- In addition to the CTO role, it was mentioned that currently there is not one single operational function managing cross-border transportation which includes customs brokerage. A transportation organization was named which manages the flow of goods throughout the supply chain in all modes of transport including customs brokerage.
- With regards to the upcoming requirement to buy CBAM certificates at the EU ETS it was proposed by one interviewee that purchasing reaches out to some of the suppliers in the EU who work in industries that are already familiar with the ETS. This is to better understand the process and to provide insights into learnings from these industries in the last decade.

4.4. Chapter Summary

This chapter showed the empirical results of this thesis research. Each chapter addressed one of the sub-research questions to answer the main research question in the conclusion. There are comparable EU regulations to CBAM, and all proposals analyzed follow a similar structure. In addition, the regulations define their scope based on the harmonized system tariff code (HS code). Hence, the products affected by the regulations can easily be identified based on their HS code. In all reviewed regulations customs is the enforcement agency which means customs plays a big role in the implementation and operational execution of the regulations. The qualitative coding approach combined with the quantitative survey showed there are several necessary conditions in the regulation. The survey showed that not all extracted conditions were regarded as a necessary condition. It was possible to combine the necessary condition statements into a few groups. This shows that general company processes and CBAM specific process are in scope of record keeping. The adapted customs-oriented value chain model was used to create activity tables to ensure compliance with the upcoming CBAM regulation. The activity tables show data elements, collaboration activities and involved functions which are needed to comply with a group of necessary conditions. From these activity tables one exemplary functional table for trade compliance was created to show which direct, indirect, and quality assurance activities fall in the scope of trade compliance to comply with CBAM. In addition, important remarks made by the interviewees were listed.

5. Conclusions and Recommendations

This chapter provides conclusions of the research findings and answers the main research question and sub-questions. Furthermore, it depicts the validity and reliability of the research approach and outlines the limitations of the research. The chapter ends with suggestions for further research.

5.1. Conclusions

This thesis research follows a mixed methods approach which combines several independent research methods in one empirical study. The approach taken is a combination of qualitative and quantitative research methods. Necessary conditions were extracted from a legal text using qualitative content analysis methods. These were then tested using a survey which is a method of the quantitative research domain. Next, a single case study analysis was performed of one instance of the research object in a real-life context is performed. Last, an adjustment of an operating design model inspired by value creation models is conducted. This combination of independent research methods gives this thesis research its own signature research design. It constitutes a new integrated and formulized approach for companies to prepare for upcoming EU regulations. In addition, it also challenges traditional research approaches which makes the approach inspiring for other researchers. This thesis research creates a new innovative research methodology.

The literature review shows Trade Compliance is still not part of the compliance domain. Legal compliance encompasses competition law, money laundering, data privacy, anti-corruption, and bribery only. Moreover, trade compliance is also not part of the C-level decision making process of companies. The trade compliance or customs compliance function has usually been a midlevel function somewhere in operations, legal, or finance. Customs management within companies still is the domain of a small group of experts. Trade Compliance managers see this long-serving model as outdated because in their view trade compliance has become enormously complex in the past years. It became a significant source of corporate risk and therefore senior management needs to navigate the company through geopolitical hazards and make supply chains more resilient. The role of trade compliance managers comprises different activity areas such as logistics support, supply chain management and regulatory compliance. This is also visible in the growing number of bilateral, and regional trade agreements, environmental regulations, sanctions, and tariffs.

To answer the first research sub-question of what are comparable supranational regulations to CBAM, the answer is straightforward. There are comparable EU regulations to CBAM. In this thesis, two other proposed regulations were compared to the carbon border adjustment mechanism regulation proposal. All three proposals follow a similar structure which leads to the conclusion that the EU is not innovative in writing regulations. As there are comparable regulations to CBAM, this approach can be helpful and replicable to upcoming regulations. What was noticeable is the regulations define their scope based on the harmonized system tariff code (HS code). The products affected by the regulations can be easily identified based on their HS code. In all reviewed regulations customs is the enforcement agency. Both aspects, the HS code, and customs as the enforcement agency, is a very important development for trade compliance management. This underlines relevance of the research problem for this thesis research. Trade Compliance ensures customs compliance within the company. This can be reviewed in

the operating model of the trade compliance organization. Thus, there will always be the discussion whether a regulation comparable to CBAM will be a trade compliance challenge or not. Moreover, supply chain due diligence plays a major role in all three reviewed proposals. This is similar to upstream/downstream CSR efforts which focus on shared responsibility and ethical implications of corporate supply chains. All proposals impact EU importers but in fact they will highlight what happens outside the EU. For example, CBAM will visualize where most carbon emissions happen outside the EU. As two out of three proposals fall under the EU Green Deal it can be assumed that future regulations of the Green Deal will follow the same structure and approach. This type of regulation will be the new standard and CBAM and deforestation set this new standard.

The second sub-question of what are necessary conditions in the CBAM regulation is answered in the following. The qualitative coding approach combined with the quantitative survey showed that there are several necessary conditions in the regulation. The survey showed that not all extracted conditions are regarded as a necessary condition. For some extracted conditions, on the other side, there was full agreement the statement constitutes a necessary condition. It is recognizable that necessary conditions reflect the company has to do something in order to comply with the regulations e.g., monitoring the business processes impacted by the regulation and adherence to reporting requirements. Grouping the necessary conditions indicates that a comprehensive business operations review is essential to assess the potential impact of the upcoming regulation. It must not be forgotten that CBAM is still a proposal and not yet in force. Nevertheless, this approach supports the planning and preparation process within the company. It limits the uncertainty for business decision makers, but a certain risk remains.

When comparing the mixed methods approach to the standard legal research approach, differences and similarities become visible. The standard legal research approach is to read the legal text and search for key words. These findings are then used for interpretation by the researcher and verified using surrounding documents from e.g., the European Parliament or interest groups to understand the context and intentions of the legal text. Legal research would look for strict legal duties and obligations in the text. It is comparable to coding key words in the regulation proposal using a text coding tool. This research step is about identifying strict legal duties what needs to be done and what should be avoided. The last step is to analyze how the identified duties relate to each other. For example, if all duties must be satisfied or if alternatives are applicable. This process step is not needed in necessary condition analysis. In legal research, the findings and interpretations of the legal text are subject to public interpretation. When another researcher does not agree with the interpretation, he would publish his own interpretation of the legal text. This is different from the mixed method approach here. The approach chosen in this thesis is more formalized and structured using established research methods. The legal approach is about interpretation while the necessary condition analysis is based on the simple proposition "X is necessary for Y OR absence of X results in absence of Y". There is no interpretation possible in the approach. Either the strict legal duty constitutes a necessary condition or not. Using the necessary condition analysis in legal research might lead to more clarity and certainty in the analysis of legal texts.

The third sub-question was about how the customs-oriented value chain model can help implement appropriate compliance measures and how thinking in necessary conditions can support this process.

The necessary condition analysis helped the researcher and the trade compliance team to better understand the proposed regulation. For the trade compliance team, the necessary condition thinking approach helped to determine which already existing compliance tools can be expanded and which are missing. Mainly the calculation is the novum while the remaining regulation requires regular compliance tools such as reporting and record keeping. The interviewees appreciated the analysis results during the introduction meeting but did not look into the necessary conditions prior to the interviews. It is assumed they were not familiar with the necessary condition methodology and did not fully understand the importance and implications of this methodology although the basic principles were presented during the introduction meeting. During the interviews it also became visible that compliance people have a better overview of company processes and the company setup. Many interviewees were not familiar with corporate policies or legal obligations that constrain the business in its daily operations. Trade compliance was always named as the steering or leading function for the implementation of CBAM compliance. Here the question arises whether trade compliance is the best function to implement CBAM compliance or was trade compliance named solely due to the fact that the researcher is part of the trade compliance organization. Trade compliance presented CBAM to the organization and led the discussion so far. For this purpose, the customs-oriented value chain is a suitable to show compliance with CBAM is not the responsibility of trade compliance alone. The model clearly shows which data and collaboration activities between various functions in the company are needed. It becomes visible, and that was also acknowledged during the interviews, that a cross functional central team is needed to ensure compliance with CBAM. The downside of the approach is data, collaboration activities and functions cannot be linked directly to one necessary condition. It was only possible to put the data elements in the group of necessary conditions. Thus, further work is required to define the exact project team and scope for the CBAM compliance implementation. Nevertheless, the model shows from which areas of expertise project members must come from. It also shows which data is potentially needed and makes it possible to analyze which data is already available in the company and which is a new requirement. Altogether the model helps and supports the implementation process. The necessary condition analysis represents an efficient way to visualize the compliance requirements. How accurate the model and the data elements are must be reviewed when CBAM is in full force. Only then can finally be determined whether compliance was ensured.

The main research question for this thesis research was how to ensure supply chain compliance with a (proposed) supranational regulation in a multinational manufacturing enterprise. The importance is on ensuring compliance and this can be answered with an unbiased yes. Several achievements were reached during the research so that compliance in the company is ensured. The approach can be a blueprint for other regulations and other companies as it is replicable and the need for compliance became clear. The approach was understandable and comprehensible for all involved people. Overall, there is now a general awareness of the upcoming regulation and the potential impact on the manufacturing operations. The necessary condition analysis provided a good understanding of the compliance requirements. The customs-oriented value chain model showed that supply chain compliance is a cross functional team effort and not the responsibility of one function alone. Moreover, the project team composition is known, and the involved functions understand their role in the project. Their contributions will be valuable during the next steps towards CBAM compliance. Regarding the

time factor the company is on time or even ahead of time as the transition period is yet to start. Overall, the methodologies chosen will ensure supply chain compliance with supranational regulations in multinational companies. The approach supports the process of raising awareness in the company and helps to inform the people about the upcoming requirements. There is a lot of uncertainty left because CBAM is currently just a proposal but as long as the company follows up on the developments and publications compliance will be ensured.

5.2. Business Relevance

From a business perspective the preparations to comply with CBAM need to go on and are not finalized yet. Senior management needs to be informed about the work done and needs to sign off the project to work on the future CBAM process. For this purpose, a project charter needs to be established including the project team consisting of people from the functions highlighted during the interviews. This also requires setting an action plan with milestones. A possible milestone is to be ready with reporting when the transitional period starts. During the project the activity tables and functional tables of the value chain model need to be extended or created.

Collaboration amongst different departments in a company is standard. As it was argued in the beginning of the thesis regulations enforced by customs are seen as a trade compliance problem alone. This new collaborative approach can be applied to various other areas of the company and not only for regulations. There are other possibilities where the approach can be applied e.g., when planning the market entry of a new product where various departments need to collaborate. Market entry of a new product could be regarded as a marketing problem alone.

Thinking in necessary conditions can be made a standard business practice. It helps compliance people to better understand legal texts and to translate these into business terms. This is applicable to the trade compliance domain but also for other legal domains such as anti-corruption. It may also support in decision making processes. NCA outlines the bare minimum which needs to be done to avoid a certain outcome. This way of thinking can lead to better decision making to avoid negative outcomes or evoke positive outcomes.

5.3. Validity and Reliability

As outlined in the research methodology chapter, the case study in this thesis follows the works of Yin and Eisenhardt. Yin outlines four tests to assess the quality of empirical research: construct validity, internal validity, external validity, and reliability.¹¹³

Construct validity is ensured by applying a two-step approach. First, the original objective of the study is to ensure supply chain compliance with upcoming regulations in a company. The operational measure for this is the proposed carbon border adjustment mechanism proposal.

Internal Validity is safeguarded by using explanation building and the use of logical models. This is achieved by creating visual displays such as graphics and tables and by putting information in chronological order.

¹¹³ Yin, *Case Study Research and Applications*, 42-43.

External validity aims at showing whether and how the findings can be generalized. This test is passed when the research deals with the “how” of a situation. The findings clearly show that the approach taken can be generalized and replicated to other upcoming EU regulations.

Reliability is ensured by outlining all the relevant research steps and methods in the research methodology chapter. As replication in case study research is difficult, the focus is on transparency. The description and discussion of research methods is exhaustive enough for another researcher to follow the same procedure by studying another case e.g., another proposed regulation of the EU Green Deal.

5.4. Limitations and Contributions

It is important to consider several limitations of this study. This thesis research is limited by the view and the company structure that this research is supported by. This research focuses only on this company’s organization. The findings of the necessary condition analysis are not applied to other organizations. This influences the research results.

Another limitation is the use of a survey to validate the constitution of the necessary conditions. Originally, necessary conditions are validated using a mathematical method and ceiling methods. This is not possible for this research as no experiences and no data on CBAM is yet available.

This research focuses on the compliance part of the regulation only and not on other consequences. For example, it is not investigated how the trading process for the certificates will work or how the calculation of the embedded emissions is calculated and verified.

Furthermore, including other cases (other regulations) in the necessary condition analysis and later in the internal discussion was not possible in the given timeframe for the thesis. It would have increased the scope of the research.

Lastly, the survey has only yes and no answers. This is a limitation for the respondents but provides clearer answers for the research. It is also closer to the original implication of the necessary condition concept whether a statement is a necessary condition or not. However, the approach provides no clear picture whether the potential necessary conditions describe what the regulator and policy makers intended to achieve. This is to be seen when CBAM will be in force.

Notwithstanding the above limitations, this thesis makes three contributions. First, the mixed methods approach as a new research methodology adds to the available research methodology. Second, it provides a new structured method for companies to prepare for upcoming regulations which impact their business operations. Third, the thesis applies the necessary condition analysis to the legal and compliance research domain.

5.5. Recommendations for Future Research

To further assess the current state of research on trade compliance management in the literature, other journals like the “Global Trade and Customs Journal” should be reviewed. The scope of this research only allowed for a limited review. The topic “Trade Compliance Management in Companies” is rich enough to conduct a separate study on its own. Trade Compliance management and organization is a standing topic on functional conferences and many trade compliance or customs managers are eager

to hear from other trade compliance managers about their organizational structure, IT tools, and responsibilities of the trade department.

This thesis research uses the necessary condition analysis (NCA) method. The original approach of the NCA is not entirely followed. The researcher only uses the “thinking in necessary condition” part of the analysis. When data on CBAM shipments is available the same analysis could be performed with other data. Each necessary condition used in this thesis research should be analyzed using the original statistical methods of the NCA. For that purpose, appropriate methodologies would be needed to collect data on each necessary condition individually. Such research would challenge the approach taken in this thesis and conclude how accurate the results of this research were.

The proposed mixed methods approach is a new structured way to analyze proposed regulation and drive the company internal preparation process. The applicability and generalizability need to be tested and verified with other proposed legal regulations. For example, considering the other two proposals that were included in the analysis (deforestation and forced labor ban) would be a good starting point for future research.

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Thesis or Dissertation

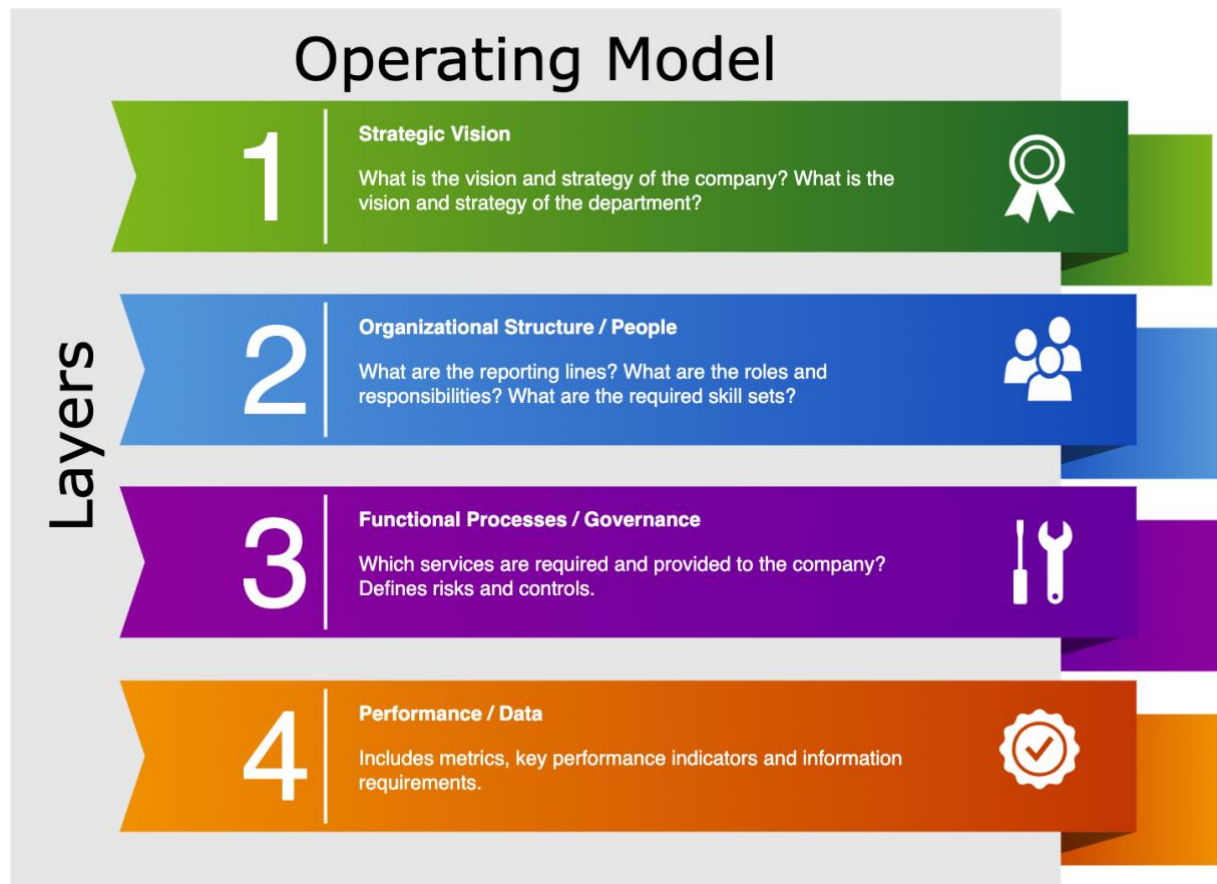
Amptmeijer, Iris. „The customs-oriented value chain How customs-oriented collaboration across the value chain supports value creation in the customs operations of a multinational manufacturing organization." Master Thesis, Rotterdam School of Management, Erasmus University, 2020.

Appendices

Appendix 1: Operating Model of the Company

The company's trade compliance organization used for this research is described based on the following operating model as outlined in chapter 2.3.

Figure 3: Operating Model



Source: Author

1. Strategic Vision

The company's strategy was last reformulated and communicated in 2021. The vision of the company is to create a world in which water issues are no longer a constraint to health, prosperity, and sustainable development. To achieve this vision the strategy is to help customers solve the world's greatest water challenges with innovative products, services, and solutions. The company is a leading water technology company committed to "solving water" by creating innovative and smart technology solutions to meet the world's water, wastewater, and energy needs. In a world of ever-growing challenges, the company delivers innovative water technology solutions throughout the cycle of water. Their technological strength across the life cycle of water is second-to-none. From collection and distribution to reuse and return to nature, our highly efficient water technologies, industrial pumps, and application solutions not only use less energy and reduce life-cycle costs, but also promote sustainability. The following figure shows the company's corporate strategy.

Figure 4: The Company's strategy



Source: Company Internal Data

The important part of the strategy is to include sustainability in everything that the company does. Sustainability is fundamentally core to everything the company does. From their own operations and solutions to the numerous ways they impact the communities around the world they are a part of, sustainability is at the center of their innovative solutions, their mission, and their ethos. In addition, the company joined the UN Sustainable Development Goals (SDG) Ambition program in 2021. The SDG aim to challenge and support participating companies of the UN Global Compact in setting ambitious corporate targets and accelerating integration of the SDGs into core business management.¹¹⁴

According to Blenko and Root, to design an appropriate operating model, the strategy needs to be translated into a set of design principles. These design principles define what the organization must do to enable execution of the strategy. The principles consist of 7-15 simple yet specific statements and the approach can be applied to a business unit. In addition to the strategy, the design principles are also influenced by aspects of the organization that could negatively impact the strategy implementation and therefore must be changed. On the other hand, organizational strengths shall be preserved.¹¹⁵ Therefore, in the following the design principles for the global trade compliance organization based on the 2021 strategy are shown. The design principles already indicate briefly but distinctly what is expected by trade compliance.

¹¹⁴ 2021 Sustainability Report, *Xylem* (2022), <https://www.xylem.com/siteassets/sustainability/2021/xylem-sustainability-report-2021.pdf>.

¹¹⁵ "Design principles for a robust operating model," Bain, accessed December 22, 2022, <https://www.bain.com/insights/design-principles-for-a-robust-operating-model/>.

Figure 5: Design Principles for the Operating Model (OM)

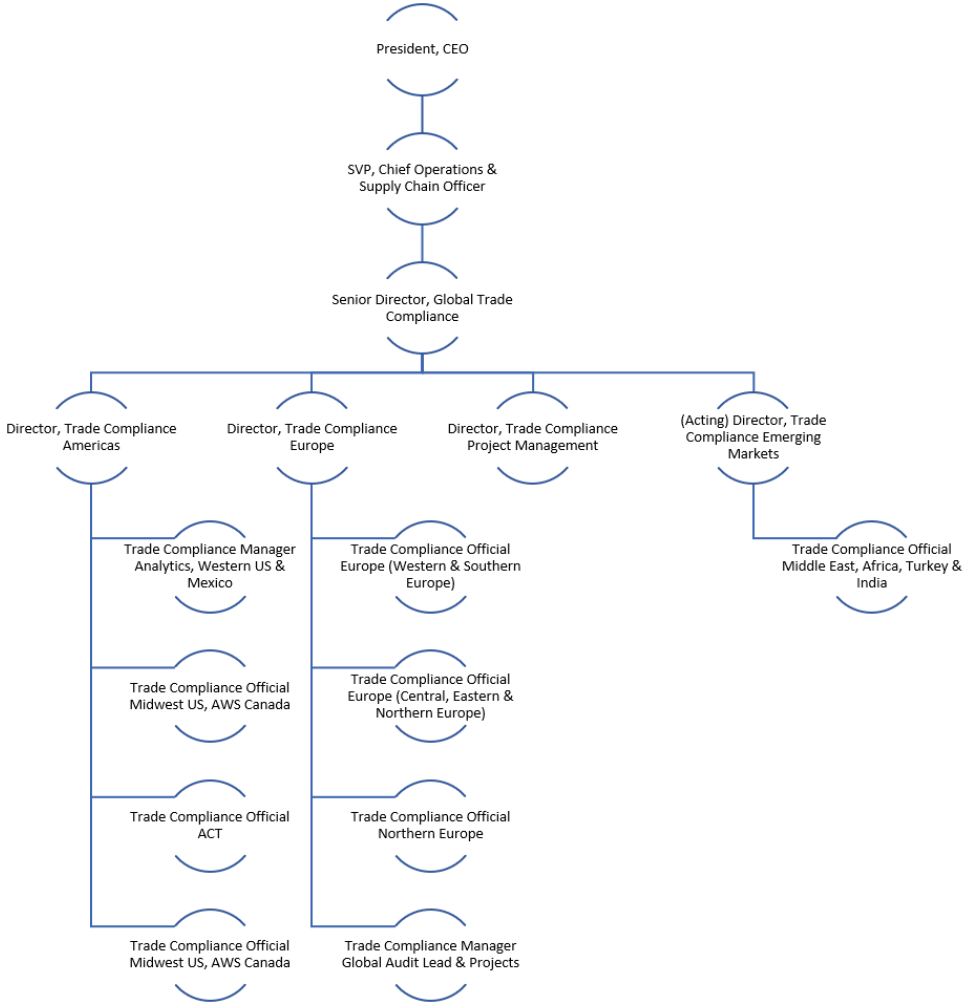


Source: Author

2. Organizational Structure / People

The company chose a matrix model with functions leading in specific areas where expertise matters. For example, the trade compliance officials (TCO) are the subject matter experts for customs and export control topics. The following figure shows the organizational chart for the company's trade compliance department. Within the company, trade compliance is part of the corporate integrated supply chain organization. Although the organizational chart might lead to the impression that the organization follows a straight-line organization, this is only true for the trade compliance organization itself. The TCOs support all different business units that would typically be in the vertical axis of the matrix. Trade Compliance is part of the horizontal axis of the matrix.

Figure 6: Organizational Chart



Source: Company Internal Data

The Trade Compliance organization is divided in the classical regions Europe, Americas, Middle East, Africa, and Asia-Pacific. The TCO for the Asia-Pacific region does not report with a solid line into the trade compliance organization. For simplification purposes dotted reporting lines are left out. Trade compliance was moved into the integrated supply chain organization in June 2022. Before that, trade compliance used to be part of the legal organization. More precisely it was part of the ethics and compliance domain within legal.¹¹⁶

The roles and responsibilities of the trade compliance organization staff are clearly outlined in the TCO job description. The main role is to manage the trade compliance program in the respective sub region and ensure that commodities cross border efficiently and compliant. The trade compliance officials are responsible for the development and implementation of procedures and metrics to ensure import and export compliance with laws and regulations and the company’s trade policies at the business locations in the region. This includes implementing and enforcing the company’s trade initiatives which may include local and foreign government initiatives. The TCOs also work with business location management and other business location department managers to assure full compliance in their

¹¹⁶ Company internal information

respective areas.¹¹⁷ Trade Compliance in the current company setup clearly is a support function in Porter's Value Chain Model. The function can be compared to the roles and responsibilities of the support activities Porter uses.¹¹⁸

3. Functional Processes / Governance

Since the organizational structure is known the question arises what activities should be performed by the trade compliance organization to support the strategy. For that, the company distinguishes between trade compliance and trade operations. The trade operations are all tasks that the employees carry out during the regular business processes. The trade compliance tasks are more of strategic nature where external guidance from a consultant would be needed by the company. In general, the TCOs act as internal auditors and consultants. One of the main functional processes is the audit process which is carried out in a defined cycle. Every three years a location is audited by a TCO against laws and regulations as well as the company's internal policies. For this, an internal risk assessment supports the decision which sites are to be audited. This risk assessment also influences the audit results. Moreover, the trade compliance organization educates and informs the company. This is done through various internal trainings and internal communication. In addition, trade compliance oversees changes in laws, regulations and authority guidance and communicates them internally to the relevant stakeholder.

4. Performance / Data

Like every other organizational unit trade compliance sets goals for each year which can be individual goals per TCO or for the whole team. These are tracked and updated on a quarterly basis in a suitable IT tool. Trade Compliance uses a small number of key performance indicators (KPI) so far. The current KPIs mainly relate to third country shipment values, duties paid and broker fees. Audit results are not linked directly to the performance of trade compliance because the trade management program is the responsibility of the site leadership team with the support of the respective TCO. Nevertheless, audit results are a very good indicator to assess the overall level of trade compliance of the company. The audit results are used to create remediation plans and other initiatives to improve the level of trade compliance within the company.

¹¹⁷ Company internal information

¹¹⁸ Michael E. Porter, *Competitive Advantage: Creating and Sustaining Superior Performance* (New York: Free Press, 1998) 40-43.

Appendix 2: Survey Questionnaire



Carbon Taxation

Dear participants,

I am looking for respondents that support my analysis of the proposed EU Carbon Border Adjustment Mechanism.

This survey is conducted as part of my master thesis research project for the Executive Master in Customs and Supply Chain Compliance at the Rotterdam School of Management (RSM), Erasmus University.

Filling out the following questionnaire takes about 10 minutes.

All information is collected anonymously and treated confidentially.

The data collection and evaluation is carried out exclusively for my master thesis work.

Questions marked with an asterisk (*) must be completed.

Thank you for your support.

Best regards,
Sina Klautke

Carbon Taxation



sina.klautke@googlemail.com wird nicht geteilt
[Konto wechseln](#)



* Erforderlich

What is your area of work? Please choose. *

Auswählen



In what business area are you working? Please choose.

Auswählen



Please answer the following questions.

What is your knowledge of the Carbon Border Adjustment Mechanism (CBAM)? *

In short, CBAM is a taxation of carbon emissions that are emitted in a country outside the European Union and levied on goods whose production caused these emissions when they are imported into the EU.

I never dealt with CBAM before 1 2 3 4 I regularly deal with CBAM

What is your knowledge of the necessary condition analysis (NCA) method? *

In short, necessary conditions follow the theoretical logic "Y only if X". If absent, necessary conditions are bottlenecks that prevent the outcome from existing.

I never dealt with NCA before 1 2 3 4 I regularly deal with NCA

Please express your agreement or disagreement with the following statements from a company's point of view.

Remember, these statements depict potential necessary conditions for a company in order to comply with the CBAM regulation. If a company does not meet the condition they will fail to comply.

Ensuring that a CBAM declaration is submitted yearly to the competent authority ^{*} is necessary to comply with the regulation.

Disagree 1 2 Agree

Assuring that all relevant shipments including shipments under special customs ^{*} procedures are included in the CBAM declaration is necessary to comply with the regulation.

Disagree 1 2 Agree

Analyzing where carbon tax was paid in the country of origin of the goods listed ^{*} in Annex I is necessary to reduce the number of certificates to be surrendered.

Disagree 1 2 Agree

Verifying that required CBAM certificates are surrendered on a yearly basis is a ^{*} prerequisite to comply with the regulation and to file a complete CBAM declaration.

Disagree 1 2 Agree

Ensuring that a CBAM report is submitted per quarter to the competent authority ^{*} is necessary to comply with the regulation.

	1	2	
Disagree	<input type="radio"/>	<input type="radio"/>	Agree

Making sure that the competent authority reimbursed the authorised declarant for ^{*} surrendered CBAM certificates is necessary to reduce the financial impact of the purchase of CBAM certificates

	1	2	
Disagree	<input type="radio"/>	<input type="radio"/>	Agree

Ensuring that all required CBAM certificates have been surrendered is a ^{*} necessary condition to avoid penalties.

	1	2	
Disagree	<input type="radio"/>	<input type="radio"/>	Agree

Implementing measures to detect circumvention practices related to CBAM ^{*} impacted shipments is necessary to ensure that no violation of the regulation occurs in the business.

	1	2	
Disagree	<input type="radio"/>	<input type="radio"/>	Agree

Defining which records the authorised declarant keeps is a prerequisite to fulfill ^{*} the record keeping requirements.

	1	2	
Disagree	<input type="radio"/>	<input type="radio"/>	Agree

Ensuring that adequate documentation in accordance with the regulators requirements is stored is necessary to comply with the record keeping requirements. *

	1	2	
Disagree	<input type="radio"/>	<input type="radio"/>	Agree

Safeguarding that no records are destroyed before the end of the retention period outlined in the regulation is necessary to avoid penalties. *

	1	2	
Disagree	<input type="radio"/>	<input type="radio"/>	Agree

Demonstrating to be in a good economic state without infringements of customs and tax legislation is a prerequisite for the application to become an authorised declarant. *

	1	2	
Disagree	<input type="radio"/>	<input type="radio"/>	Agree

Classifying all products into the harmonized system of the World Customs Organization is necessary to assess which imports will be subject to carbon taxation under the CBAM regulation. *

	1	2	
Disagree	<input type="radio"/>	<input type="radio"/>	Agree

Analyzing where the company is buying goods in third countries is necessary to assess which imports will be subject to carbon taxation under the CBAM regulation. *

	1	2	
Disagree	<input type="radio"/>	<input type="radio"/>	Agree

Ensuring that the applicant is established in the European Union is a necessary condition to become an authorized declarant. *

	1	2	
Disagree	<input type="radio"/>	<input type="radio"/>	Agree

Applying to become an authorised declarant is necessary to avoid supply chain disruptions because of non-compliance with the regulation. *

	1	2	
Disagree	<input type="radio"/>	<input type="radio"/>	Agree

Requesting data on carbon emissions from tier 1 and (at minimum) tier 2 supplier * is necessary to carry out the embedded emission calculation when you import complex goods (goods not produced from raw materials).

Disagree 1 2 Agree

Requesting data on actual emissions per shipment from the supplier is necessary * to calculate the embedded emissions in the shipment.

Disagree 1 2 Agree

Using default values for carbon emissions is necessary to perform the calculation * when actual emission data is not available.

Disagree 1 2 Agree

Buying CBAM certificates at the EU Emission Trading System (ETS) is necessary * to import goods listed in Annex I of the regulation.

Disagree 1 2 Agree

Determining the country of origin for all goods listed in Annex I of the CBAM regulation based on EU country of origin rules is necessary to assess the applicable country of origin of imported goods. *

Disagree 1 2 Agree

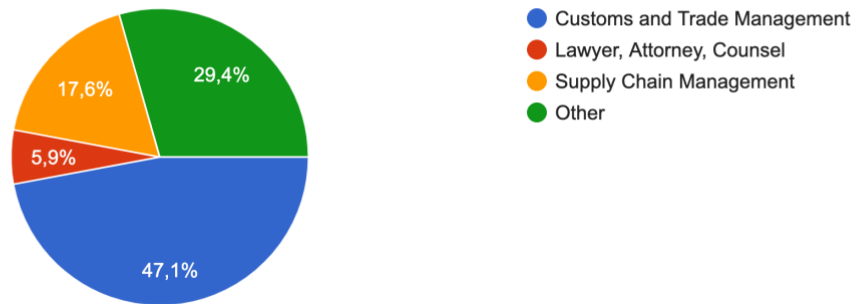
Monitoring all CBAM impacted shipments is necessary to govern CBAM related internal company processes. *



Appendix 3: Survey Results Raw Data

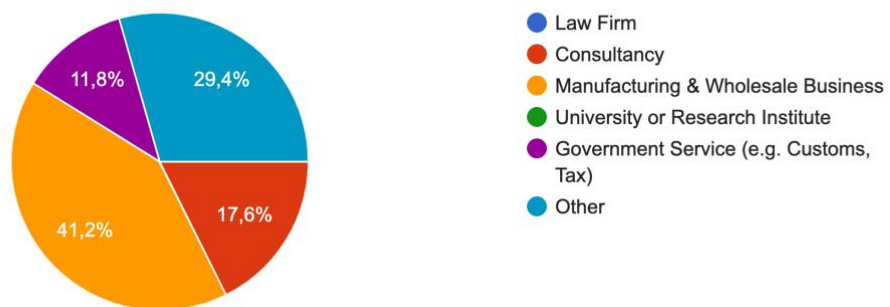
What is your area of work? Please choose.

17 Antworten



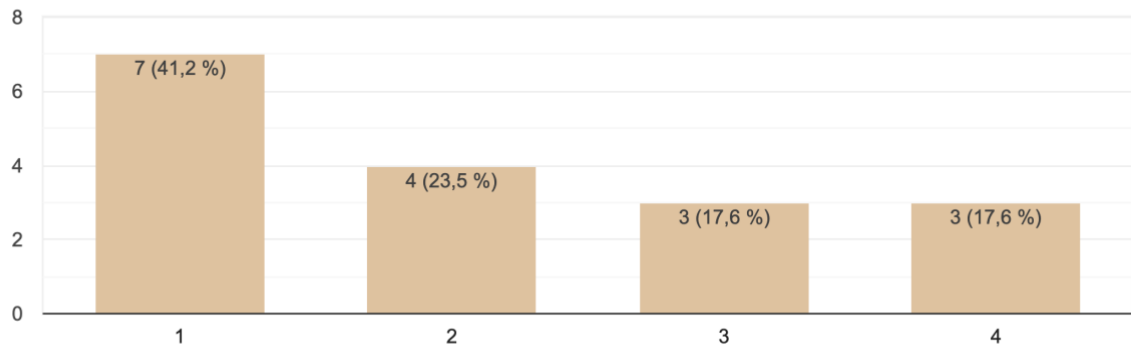
In what business area are you working? Please choose.

17 Antworten



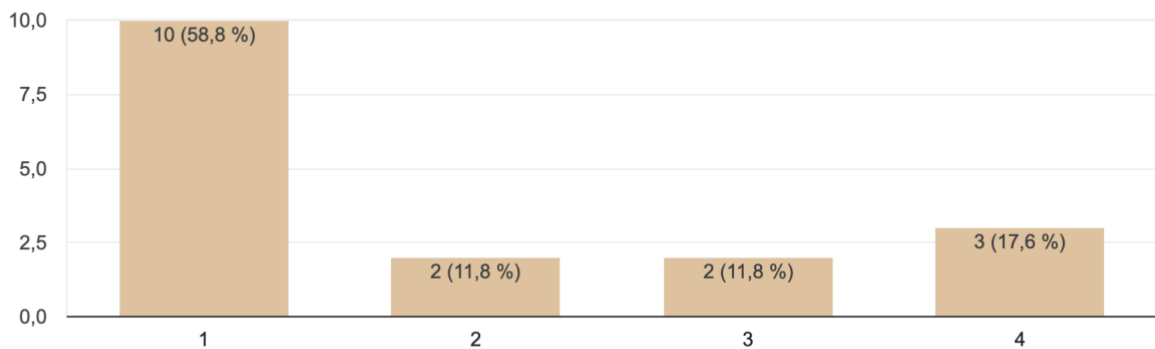
What is your knowledge of the Carbon Border Adjustment Mechanism (CBAM)? In short, CBAM is a taxation of carbon emissions that are emitted in...se emissions when they are imported into the EU.

17 Antworten



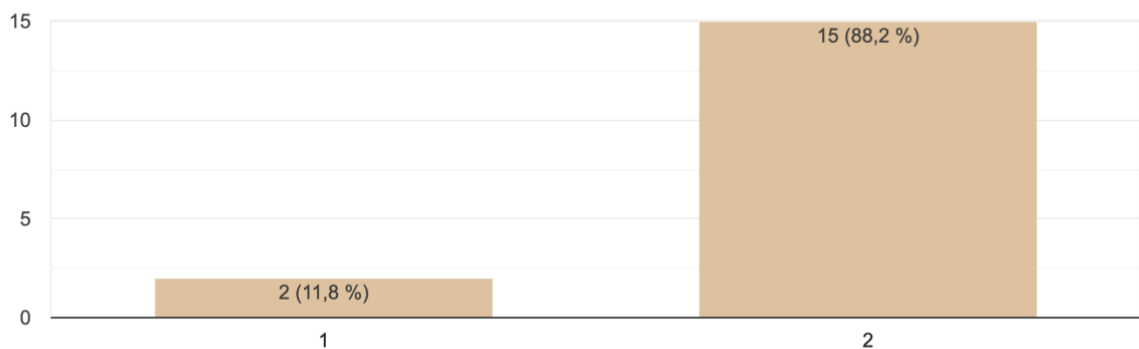
What is your knowledge of the necessary condition analysis (NCA) method? In short, necessary conditions follow the theoretical logic "Y only if X...ottlenecks that prevent the outcome from existing.

17 Antworten



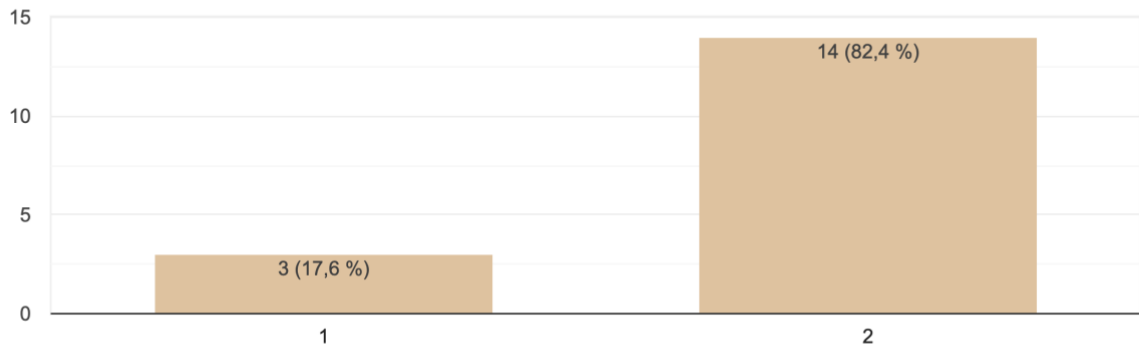
Ensuring that a CBAM declaration is submitted yearly to the competent authority is necessary to comply with the regulation.

17 Antworten



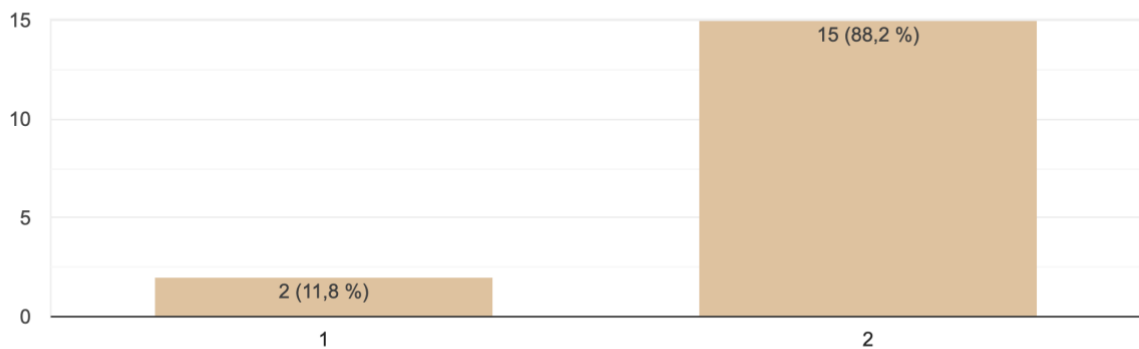
Assuring that all relevant shipments including shipments under special customs procedures are included in the CBAM declaration is necessary to comply with the regulation.

17 Antworten



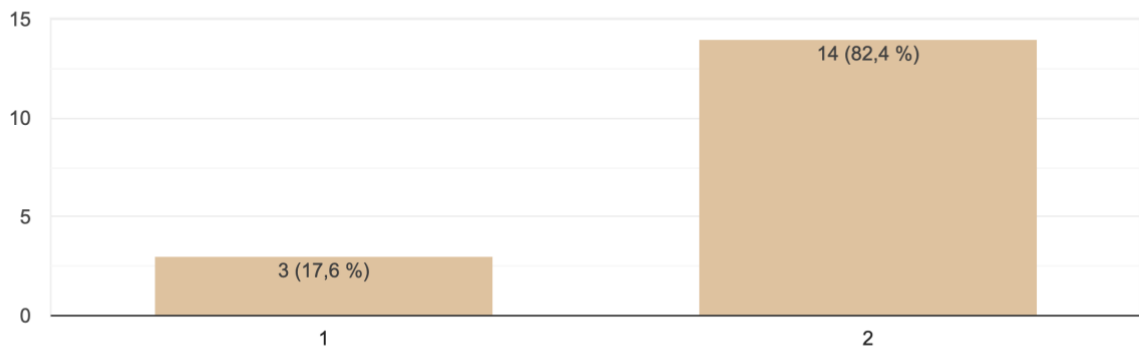
Analyzing where carbon tax was paid in the country of origin of the goods listed in Annex I is necessary to reduce the number of certificates to be surrendered.

17 Antworten



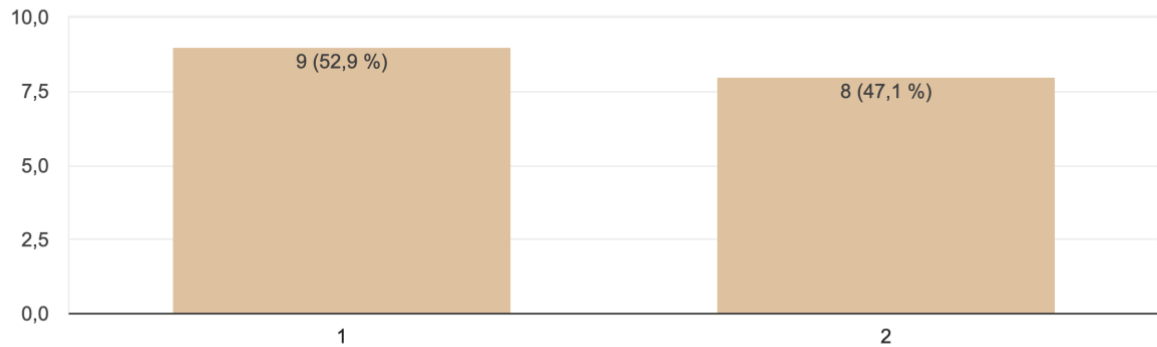
Verifying that required CBAM certificates are surrendered on a yearly basis is a prerequisite to comply with the regulation and to file a complete CBAM declaration.

17 Antworten



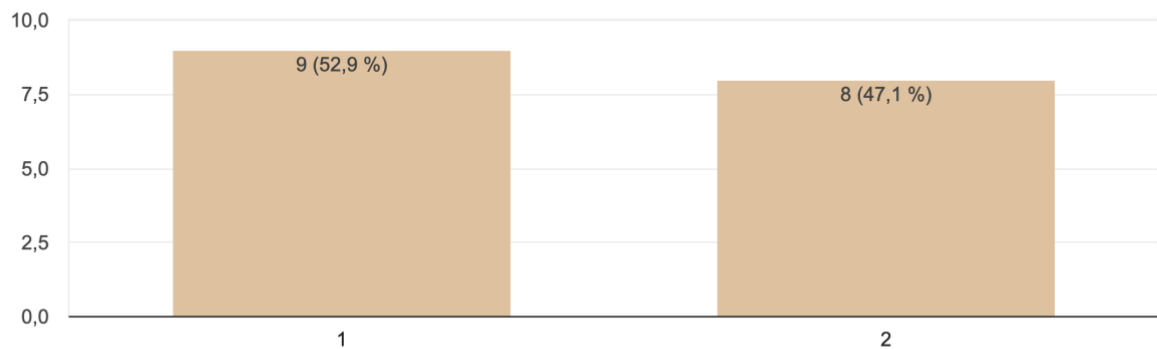
Ensuring that a CBAM report is submitted per quarter to the competent authority is necessary to comply with the regulation.

17 Antworten



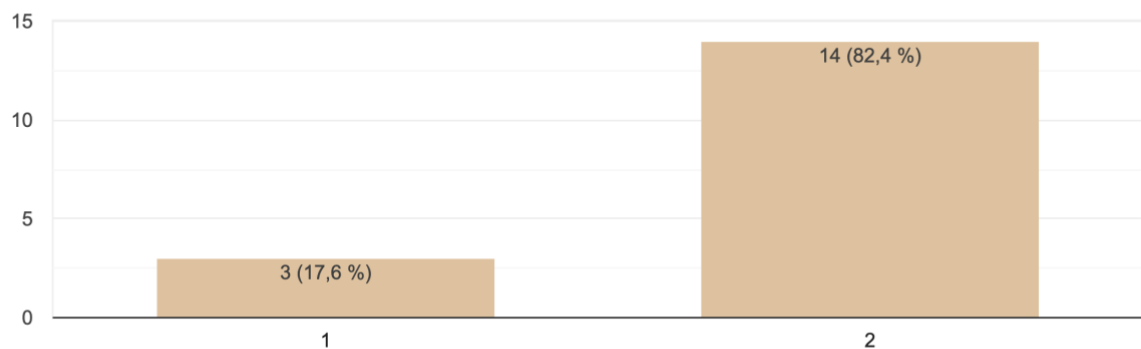
Making sure that the competent authority reimbursed the authorised declarant for surrendered CBAM certificates is necessary to reduce the financial impact of the purchase of CBAM certificates

17 Antworten



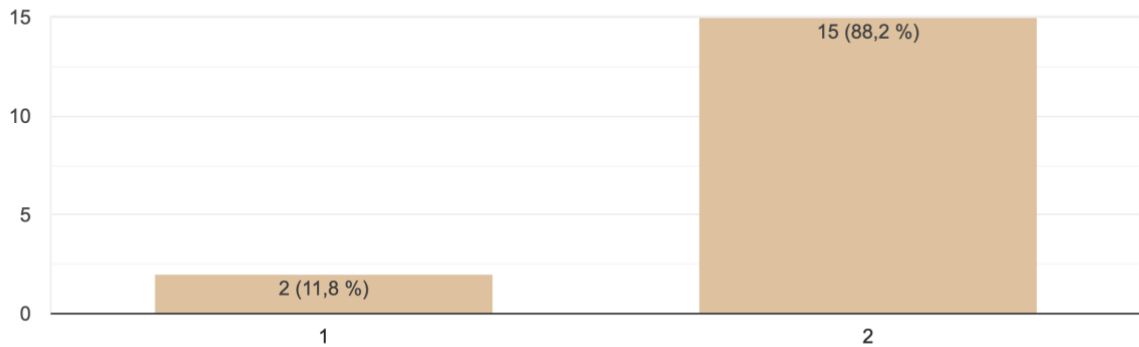
Ensuring that all required CBAM certificates have been surrendered is a necessary condition to avoid penalties.

17 Antworten



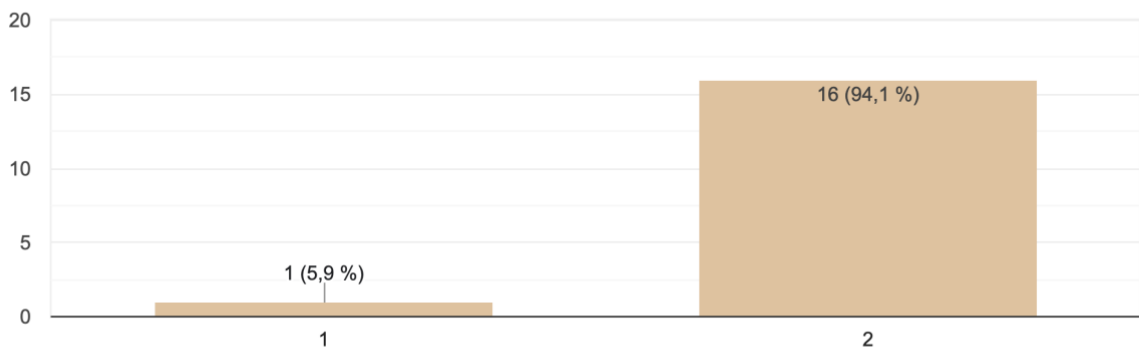
Implementing measures to detect circumvention practices related to CBAM impacted shipments is necessary to ensure that no violation of the regulation occurs in the business.

17 Antworten



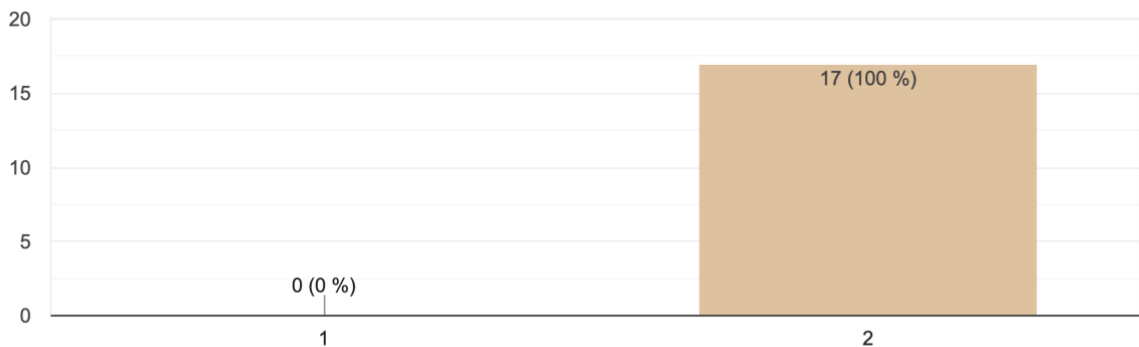
Defining which records the authorised declarant keeps is a prerequisite to fulfill the record keeping requirements.

17 Antworten



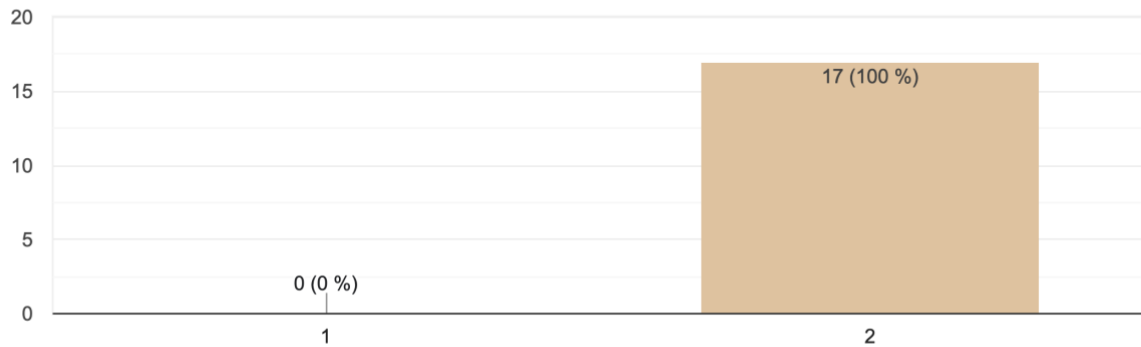
Ensuring that adequate documentation in accordance with the regulators requirements is stored is necessary to comply with the record keeping requirements.

17 Antworten



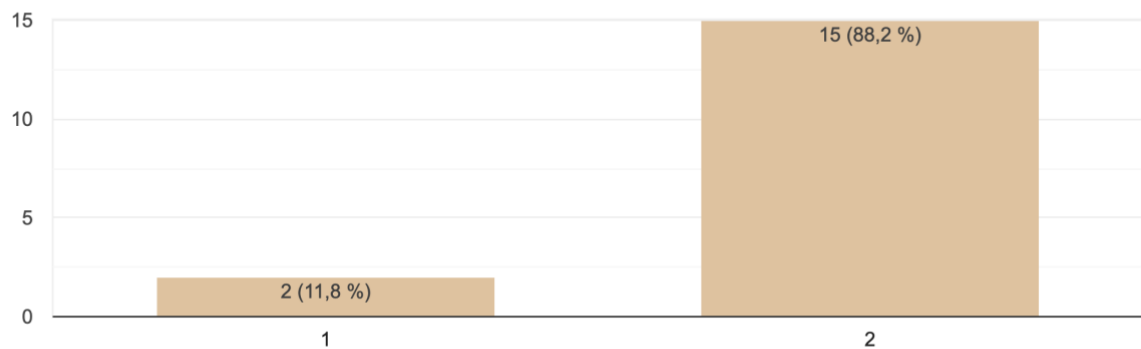
Safeguarding that no records are destroyed before the end of the retention period outlined in the regulation is necessary to avoid penalties.

17 Antworten



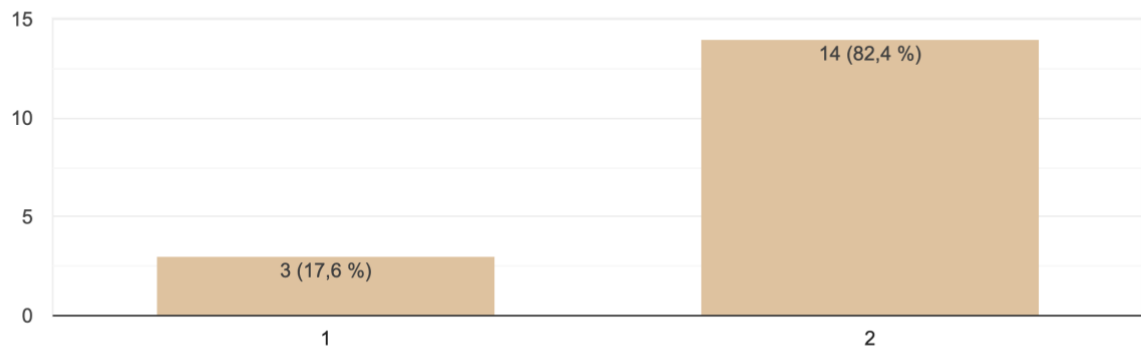
Demonstrating to be in a good economic state without infringements of customs and tax legislation is a prerequisite for the application to become an authorised declarant.

17 Antworten



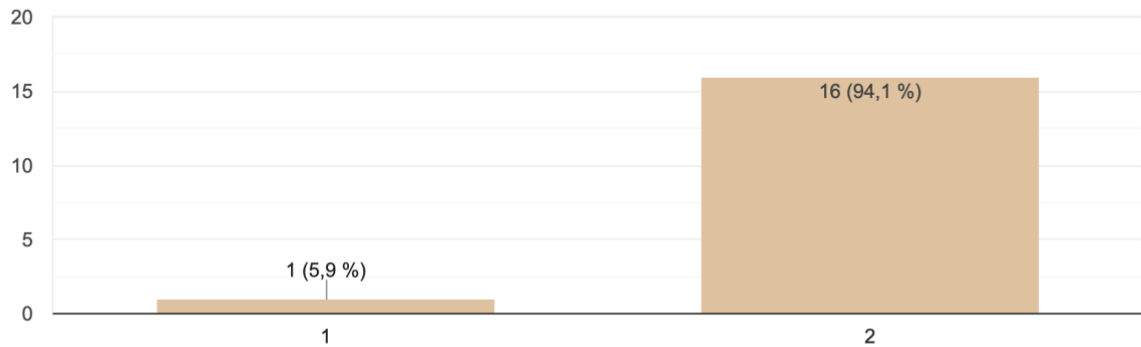
Classifying all products into the harmonized system of the World Customs Organization is necessary to assess which imports will be subject to carbon taxation under the CBAM regulation.

17 Antworten



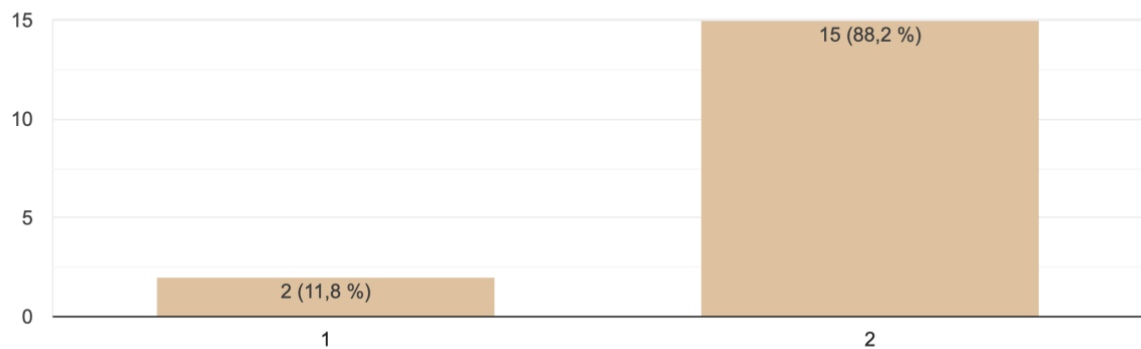
Analyzing where the company is buying goods in third countries is necessary to assess which imports will be subject to carbon taxation under the CBAM regulation.

17 Antworten



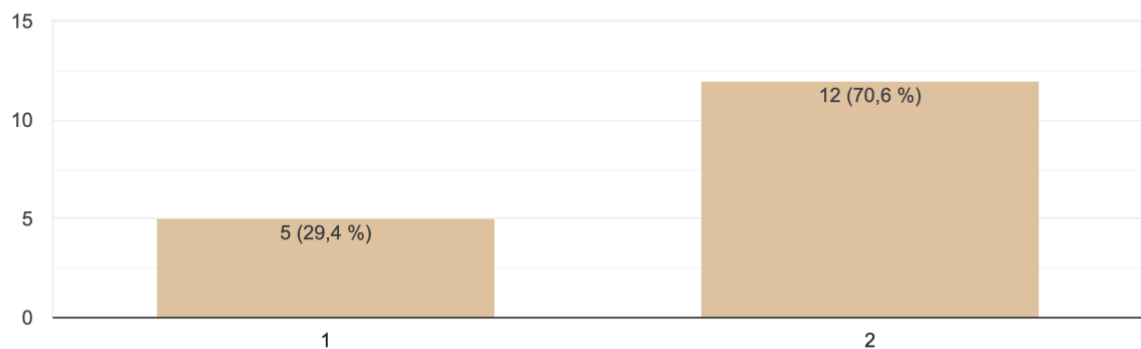
Ensuring that the applicant is established in the European Union is a necessary condition to become an authorized declarant.

17 Antworten



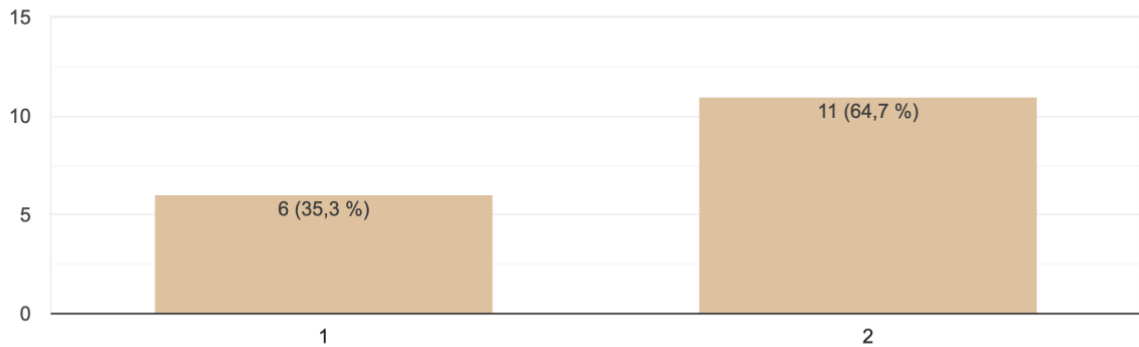
Applying to become an authorised declarant is necessary to avoid supply chain disruptions because of non-compliance with the regulation.

17 Antworten



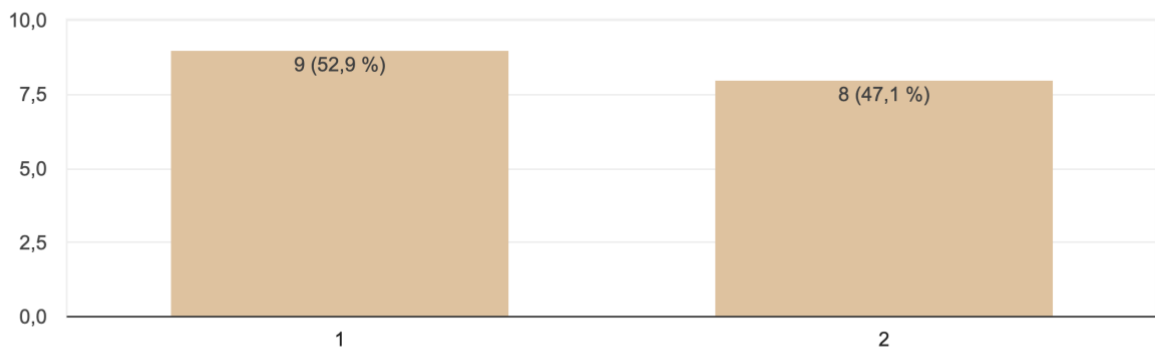
Requesting data on carbon emissions from tier 1 and (at minimum) tier 2 supplier is necessary to carry out the embedded emission calculation when...goods (goods not produced from raw materials).

17 Antworten



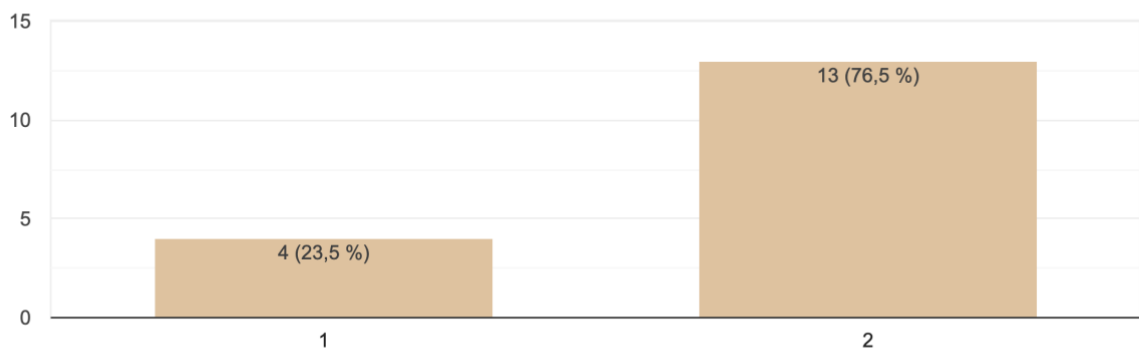
Requesting data on actual emissions per shipment from the supplier is necessary to calculate the embedded emissions in the shipment.

17 Antworten



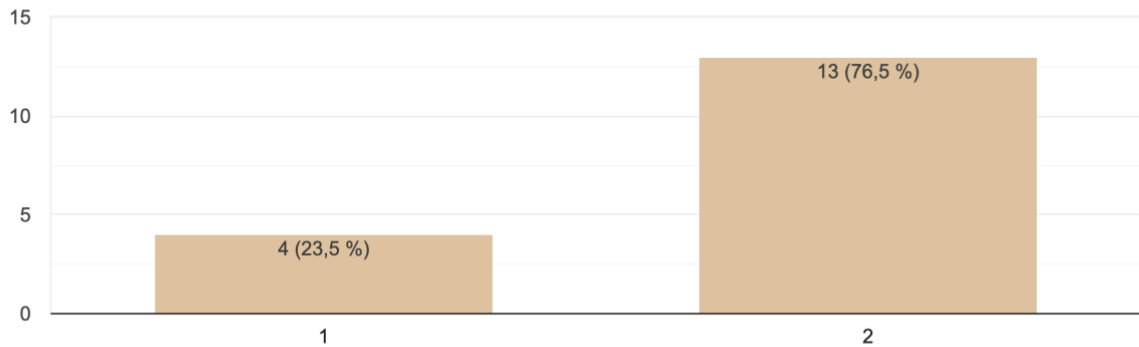
Using default values for carbon emissions is necessary to perform the calculation when actual emission data is not available.

17 Antworten



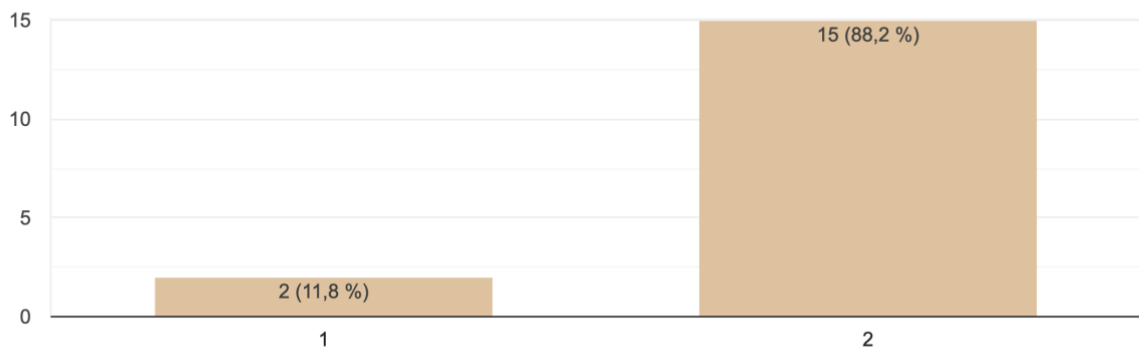
Buying CBAM certificates at the EU Emission Trading System (ETS) is necessary to import goods listed in Annex I of the regulation.

17 Antworten



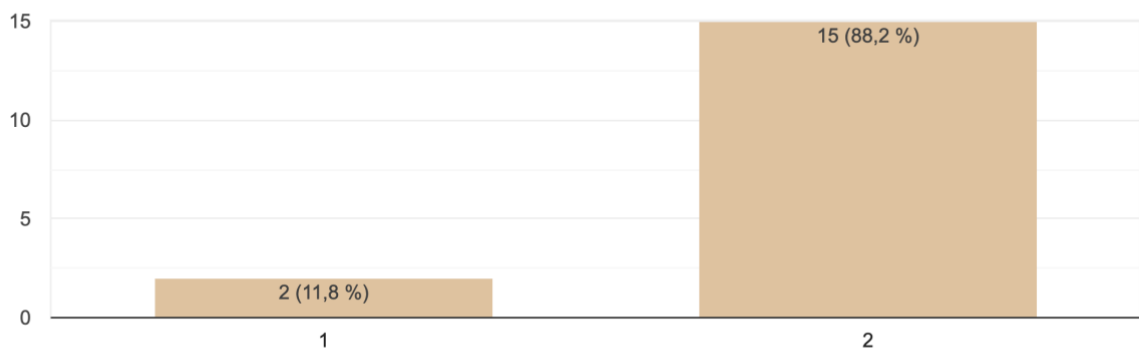
Determining the country of origin for all goods listed in Annex I of the CBAM regulation based on EU country of origin rules is necessary to assess the applicable country of origin of imported goods.

17 Antworten



Monitoring all CBAM impacted shipments is necessary to govern CBAM related internal company processes.

17 Antworten



Appendix 4: Interview Guide V1

Implementation

- What would be a possible company setup to manage and mitigate the impact of CBAM on the company operations in the EU?
- What changes to the company structure do you see relevant to comply with CBAM?

Application

- How did the data analysis help you to assess the impact of CBAM onto the business operations?
- Why do you think it is necessary to classify all products into the HS code system?
- Who should become the authorized declarant?
- Where do we need authorized declarants in the organization?
- How would you organize the application process?
- Who should be supporting the application process?
- What data do you think is relevant for the application to become an authorized declarant?
- Who can provide the relevant data?

Reporting/Monitoring/Penalties

- What would be an acceptable monitoring system to monitor all CBAM shipments?
- Who would need to collaborate to ensure a full monitoring process?
- How can we ensure that all shipments of CBAM goods are captured in the CBAM declaration?
- How would you assess the accuracy of the required reports?
- What data would you include in the monitoring process and who can provide this data?
- How would you ensure that all left-over CBAM certificates have been surrendered?
- How would you review whether the authorities paid back the correct values for surrendered certificates?
- How would you prevent circumvention activities in the company?
- What measures would you implement to detect circumvention activities?

Record Keeping

- How would you organize the record keeping process?
- How would you assess the accuracy of the records kept?
- Where would you keep the records?
- How would you ensure that no records are destroyed before the retention period is over?

Calculation

- What and why would be your preferred method to calculate the embedded emissions – default values or actual emissions?
- How would you organize the purchasing process of CBAM certificates at the EU ETS?
- Who in the company can support the purchasing process at the EU ETS?
- How would you collect the country of origin information for imported products and how would you verify the origin?

Process Ownership

- Who should be responsible in the company to comply with CBAM?
- Who should be the process owner?

Appendix 5: Interview Guide V2

Implementation

- What would be a possible company setup to manage and mitigate the impact of CBAM on the company operations in the EU?
- What changes to the company structure do you see relevant to comply with CBAM?

Reporting/Monitoring/Penalties

- What would be an acceptable monitoring system to monitor all CBAM shipments?
- Who would need to collaborate to ensure a full monitoring process?
- What data would you include in the monitoring process and who can provide this data?
- How would you ensure that all left-over CBAM certificates have been surrendered?
- How would you review whether the authorities paid back the correct values for surrendered certificates?
- How would you prevent circumvention activities in the company?
- What measures would you implement to detect circumvention activities?

Application

- How did the data analysis help you to assess the impact of CBAM onto the business operations?
- Why do you think it is necessary to classify all products into the HS code system?
- Who should become the authorized declarant?
- Where do we need authorized declarants in the organization?
- Who should be supporting the application process?
- *How can being an AEO be beneficial regarding the application to become an authorized declarant?*
- Who can provide the relevant data?

Record Keeping

- How would you organize the record keeping process?
- How would you assess the accuracy of the records kept?
- Where would you keep the records?
- *What records do you think are relevant to keep complying with the regulation?*

Calculation

- What and why would be your preferred method to calculate the embedded emissions – default values or actual emissions?
- How would you organize the purchasing process of CBAM certificates at the EU ETS?

- How would you collect the country of origin information for imported products and how would you verify the origin?

Process Ownership

- Who should be responsible in the company to comply with CBAM?
- Who should be the process owner?
- *In which policy would you include the compliance requirement for CBAM?*