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Assessing Compliance with Upcoming European
Sustainability Reporting Standards (ESRS) in the
Container Shipping Companies' Sustainability Reports:
Identifying Gaps and Discrepancies

by

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Acknowledgments

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“远渡重洋离开舒适区并不是一件简单的事情，这一年的背后有多少崩溃的时刻与他人也不可言说，这是开始，不是结束。”

Abstract

In response to intensifying global environmental challenges, the European Union (EU) has taken the lead in mandating sustainability reporting for companies. In 2022, the EU officially enacted the Corporate Sustainability Reporting Directive (CSRD), requiring companies to disclose sustainability reports in accordance with European Sustainability Reporting Standards (ESRS) starting from 2024. This marks the formal entry of sustainability reporting into a new phase of mandatory disclosure.

In light of this significant regulatory shift, it is crucial to examine how industries are adapting to these new requirements. This study focuses on the container shipping industry, a sector with substantial environmental and social impacts. By examining their sustainability reports, the paper aims to assess their current preparedness for ESRS and compliance levels.

The study employs quantitative content analysis, supplemented by a scoring system and classification analysis method, to systematically evaluate corporate sustainability reports' compliance with ESRS. Specifically, disclosure topics under each chapter are used as the unit of analysis, graded according to criteria developed based on ESRS. After evaluation, data collection and analysis utilizing Excel pivot tables for data analysis to identify compliance disparities among different companies and areas where these companies collectively show significant disclosure deficiencies.

Results reveal notable differences in compliance levels among companies, with a stepped distribution pattern. This stepped distribution in compliance levels appears to be related to the listing status and the number of employees. Overall, companies' compliance levels fall far short of ESRS requirements. The weakest area is the social aspect, particularly S3 and S4, where companies have made little substantive disclosure.

To address this situation, container shipping companies need to pay greater attention to the ESRS's double materiality principle. Furthermore, greater focus should be placed on disclosures related to strategic and financial impact aspects, as companies typically fall short in providing adequate information in these areas.

Table of Contents

<i>Acknowledgments</i>	<i>II</i>
<i>Abstract</i>	<i>III</i>
<i>Table of Contents</i>	<i>IV</i>
<i>List of Tables</i>	<i>V</i>
<i>List of Figures</i>	<i>VII</i>
<i>List of Abbreviations</i>	<i>IX</i>
<i>Chapter 1 Introduction</i>	<i>11</i>
1.1 Background and Relevance	11
1.2 Research Objectives	14
1.3 Research Design and Methodology.....	15
1.4 Thesis Structure	15
<i>Chapter 2 Literature Review</i>	<i>17</i>
2.1 Importance and Development of Sustainability Reporting.....	17
2.2 Overview of CSRD and ESRS.....	24
2.3 Current Status of ESRS adaptation	36
<i>Chapter 3 Methodology</i>	<i>43</i>
3.1 Methodology Review	43
3.2 Quantitative Content Analysis	48
3.3 Analysis Methods.....	54
3.4 Data Collection and Screening.....	56
<i>Chapter 4 Results and Analysis</i>	<i>59</i>
4.1 Compliance Level Discrepancies between Different Companies.....	59
4.2 Compliance Deficiencies across Different Disclosure Topics	66
<i>Chapter 5 Conclusion</i>	<i>78</i>
5.1 Key Findings.....	78
5.2 Suggestions for Better Compliance	79
5.3 Research Limitations	80
5.4 Suggestions for future research.....	80
<i>APPENDIX A: External Source Information</i>	<i>82</i>
<i>APPENDIX B: Original Analysis</i>	<i>93</i>
<i>References</i>	<i>96</i>

List of Tables

Table 1 General Role of Corporate Sustainability Reporting.....	17
Table 2 Evolution of Sustainability Reporting Standards	21
Table 3 Structure of the ESRS sustainability statement.....	28
Table 4 Categories of Disclosure Requirements	31
Table 5 Definition of different types of companies.....	31
Table 6 Criteria of different types of companies	33
Table 7 Timeline for the application of ESRS.....	35
Table 8 Theoretical Foundations and Assumptions.....	45
Table 9 Grading Criteria.....	50
Table 10 Data Points of Each Chapters	51
Table 11 Selected Companies.....	57
Table 12 Categorized Selected Companies	57
Table 13 Disclosure Topics in E2 and E4 with low scores.....	71
Table 14 Compliance Level of ESRS 1.....	76

Appendix Tables:

Table A 1 Detailed Categories of Disclosure Requirement.....	82
Table A 2 Horizontal Layout of the Balance Sheet (extraction).....	84
Table A 3 Illustration of Disclosure Topics	86

Table A 4 Sustainability Matters Covered in Topical ESRS 89

List of Figures

Figure 1 The European Green Deal.....	26
Figure 2 The EU sustainable finance framework.....	27
Figure 3 How CSRD and ESRS link with other policies.....	28
Figure 4 Content Structure of ESRS S1 Own workforce.....	30
Figure 5 How to identify the applicable ESRS application date.....	33
Figure 6 Compliance levels of selected Companies.....	59
Figure 7 E & S Score Trends across Companies.....	60
Figure 8 G & GI Score Trends across Companies.....	61
Figure 9 Compliance Levels by Listing Status.....	62
Figure 10 Compliance Levels by Company Scale and Listing Status.....	62
Figure 11 Compliance Levels by Company Scale.....	64
Figure 12 Compliance Levels by Number of Employees and Company Scale.....	65
Figure 13 Compliance Levels by Listing Status and Company Scale.....	65
Figure 14 Compliance Levels by Number of Employees.....	66
Figure 15 Average ESRS Compliance Levels across Different Aspects.....	67
Figure 16 Average Compliance Levels of Disclosure Topics in GI Aspect.....	69
Figure 17 Average Compliance Levels of environmental Chapters.....	70
Figure 18 Average Compliance Levels of Disclosure Topics in E Aspect.....	71

Figure 19 Average Compliance Levels of Social Chapters	73
Figure 20 Average Compliance Levels of Disclosure Topics in S Aspect	74
Figure 21 Average Compliance Levels of Disclosure Topics in G Aspect.....	75

Appendix Figures:

Figure A 1 Materiality Assessment Flowchart	83
Figure A 2 Compliance Levels by Listing Status for Companies with 2,000,000 < TEU < 4,000,000.....	93
Figure A 3 Compliance Levels by Number of Employees and Listing Status	94
Figure A 4 Compliance Levels by Company Scale and Number of Employees.....	94
Figure A 5 Compliance Levels by Listing Status and Number of Employees.....	94

List of Abbreviations

EU	European Union
NFRD	Non-financial Reporting Directive
CSRD	Corporate Sustainability Reporting Directive
ESRSs/ESRS	European Sustainability Reporting Standards
EFRAG	European Financial Reporting Advisory Group
ESG	Environmental, Social, and Governance
GHG	Greenhouse Gas
CO2	Carbon Dioxide
SMEs	Small and Medium-sized Enterprises
PIE	Public Interest Entity
DRs	Disclosure Requirements
ARs	Application Requirements
BP	Basis for Preparation
GOV	Governance
SBM	Strategy
IRO	Impact, Risk and Opportunity
MT	Metrics and Targets
GRI	Global Reporting Initiative
SASB	Sustainability Accounting Standards Board
TCFD	Task Force on Climate-related Financial Disclosures
TNFD	Taskforce on Nature-related Financial Disclosures
ISSB	International Sustainability Standards Board
IFRS	International Financial Reporting Standards
IASB	International Accounting Standards Board
VRF	Value Reporting Foundation
FSB	Financial Stability Board
CDSB	Climate Disclosure Standards Board

IR	Integrated Reporting
IIRC	International Integrated Reporting Council
SDGs	Sustainable Development Goals
TEU	Twenty-foot Equivalent Unit
ROA	Return on Assets
ROE	Return on Equity
TQ	Tobin's Q
STEM	Science, Technology, Engineering, and Mathematics
FISMA	Financial Stability, Financial Services and Capital Markets Union
SFDR	Sustainable Finance Disclosure Regulation

Chapter 1 Introduction

1.1 Background and Relevance

As the global economy continues to develop and the challenges of climate change intensify, sustainable development has emerged as a central focus worldwide. The EU has shown a particularly strong commitment to sustainability. In 2019, the EU launched the European Green Deal, aiming to transform the EU into a modern, resource-efficient, and competitive economy, decoupling economic growth from resource use (European Commission, 2022). Non-financial information, as a significant supportive component of the Green Deal (European Commission, 2022), has been continuously expanding and evolving. In line with this development, the disclosure regulations of the non-financial information have become a crucial tool for evaluating corporate performance and compliance.

The development of non-financial information reporting in the European Union dates back to 2014, marked by the adoption of the Non-financial Reporting Directive (NFRD). This directive aimed to enhance information transparency in various areas, including social responsibility, employee welfare, human rights, anti-bribery efforts (European Parliament, 2021). Responding to the growing demand for non-financial disclosures, the NFRD was implemented across all EU member states in 2018 with the requirement that all large companies with over 500 employees need to disclose non-financial information, through which, it succeeded in improving transparency, providing investors and other stakeholders with a more comprehensive view of corporate performance (Anderson, 2024; Publications Office of the European Union, 2019).

However, there were some shortcomings discovered during the implementation of the NFRD. According to the Implementation Appraisal Briefing of European Parliament, the requirement of non-financial information under NFRD encountered issues such as insufficient comparability, reliability, and relevance (European Parliament, 2021). Recognizing these limitations, the EU sought to enhance sustainability reporting standards. Consequently, in 2023, the EU introduced the CSRD as a successor to the NFRD. CSRD significantly expanded the scope of reporting requirements, encompassing approximately 50,000 companies. Followed the CSRD

requirements, these companies shall prepare the sustainability reports according to the ESRSs from 2024 (KPMG, 2024). This wide-ranging directive affects numerous sectors across the European economy, including key industries that play a vital role in international trade and commerce.

One such critical sector within the scope of ESRS is the shipping industry. Historically, shipping has been a crucial method for transporting goods, significantly boosting international trade (Carolan, 2022). In modern times, shipping accounts for 90% of global trade and is recognized as one of the most environmentally efficient modes of transport, especially when considering its productive value (International Maritime Organization, 2015).

However, the maritime industry faces numerous challenges in achieving sustainability transition, primarily due to its slow pace of technological adoption and the high capital investments required for modernization. (UN Trade and Development, 2023). Specifically, the maritime shipping sector currently is responsible for roughly 3% of global greenhouse gas (GHG) emissions. Without intervention, it is projected to account for 10% of global emissions by 2050 (Transport & Environment, 2024).

Within the broader maritime sector, different segments face varying degrees pressure to adopt sustainable practices. Container shipping, in particular, stands at the forefront of these challenges and opportunities. As a crucial part of the worldwide logistics chain, container shipping plays a pivotal role in global trade and is often the most visible face of maritime transportation to the general public. The heightened visibility of container shipping companies intensifies the pressure on them to demonstrate social responsibility and sustainable practices, compelling these firms to disclose sustainability information with greater transparency and accountability.

Additionally, container ships account for a substantial portion of global maritime CO2 emissions, representing approximately 30% of overall maritime CO2 emissions (Lu, Ming, Lu, Chen, & Duan, 2023). This substantial adverse environmental impact also demands greater transparency from container shipping companies regarding their efforts and measures to reduce

carbon emissions. Furthermore, the current sustainability reports from container shipping companies vary in quality and disclosure levels, lacking a standardized framework. This inconsistency makes it difficult for stakeholders to accurately assess and compare companies' environmental, social, and governance (ESG) performance (Zhou, Wang, & Yuen, 2021).

In light of these issues, it is increasingly essential for container shipping companies to adhere to reporting under ESRS. The reasons for this are multifaced. Firstly, ESRS is a mandatory disclosure standard that requires all companies within its scope to comprehensively report their ESG activities based on its guidelines. This requirement ensures transparency in reporting, effectively addressing public and media concerns.

Secondly, the environmental guidelines within ESRS, specifically E1-E5 (see more explanation in Chapter 2 Literature Review 2.23 Main Content and Framework of ESRS), outline detailed requirements for disclosing GHG emissions. This includes the undertakings' current emissions levels, reduction targets, and any actions or action plans implemented or planned to reduce adverse impact (European Commission, 2023). With these guidelines, container shipping companies can sufficiently showcase their efforts and initiatives to reduce emissions.

Thirdly, ESRS addresses current inadequacies in sustainability information disclosure and the difficulty in comparing data across companies by providing a unified framework with universal standards (FISMA, 2024). This framework aims to regulate corporate information disclosure, thereby improving the overall quality and comparability of company reports. By standardizing reporting practices, ESRS facilitates better assessment and comparison of sustainability efforts across the container shipping industry.

It is also worth noting that since ESRS mandates compulsory disclosures, failure to adhere to ESRS may result in companies non-compliant with the CSRD. In such cases, member states could enforce penalties or operational restrictions based on their national laws, which, in severe cases could lead to the revocation of operating licenses. The severity of these penalties varies across EU member states. In Germany, for example, fines can reach up to €10 million or 5% of the annual turnover (The CSRD Compass, 2023). Beyond these immediate penalties, non-

compliance with ESRS standards could have far-reaching consequences, including higher future compliance costs and unexpected audit expenses, thereby increasing the long-term operational burden on enterprises (Jager, 2022).

1.2 Research Objectives

The preceding discussion highlights the critical importance of the ESRS and the potential risks and consequences associated with non-compliance. As companies prepare to publish their first set of sustainability reports in accordance with ESRS in 2025, this paper aims to explore the following research question:

“To what extent do the sustainability reports of container shipping companies comply with the requirements of the upcoming European Sustainability Reporting Standards (ESRS)?”

To unpack this main question, a set of sub questions has been formulated as follows:

1. What is the scope of companies required to comply with ESRS, and what are the timelines for different categories of companies to begin mandatory reporting? (Chapter 2)
2. How do compliance levels with ESRS vary among different companies, and what are the possible reasons for these differences? (Chapter 4)
3. In which aspects of sustainability reporting do container shipping companies demonstrate inadequate disclosures? What are the possible factors contributing to these disclosure deficiencies? (Chapter 4)
4. What strategies can container shipping companies employ to enhance their sustainability reports and achieve better alignment with ESRS requirements? (Chapter 4)

This paper defines the following aspects to clarify the scope of the research and avoid potential misunderstandings:

The term "container shipping companies" does not encompass all container shipping firms. The paper selects companies that are required to disclose information under the first two phases of ESRS implementation. Specifically, these companies need to disclose information in 2025 and 2026. The selection of container shipping companies follows a thorough selection process and

the details are outlined in Chapter 3, Methodology 3.4 Data Collection.

Unless otherwise specified, all mentions of ESRS in this paper refer to sector-agnostic ESRSs. In this paper, unless otherwise specified, all mentions of ESRS refer to sector-agnostic ESRSs. The reason for this focus is that at the time of writing, ESRS standards specific to certain sectors, as well as those applicable to SMEs and non-EU enterprises, had not been released. Sector-specific ESRS for transport are anticipated to be published in the fourth quarter of 2024 (EFRAG, 2024). Furthermore, ESRS standards for SMEs and non-EU enterprises are expected to be released by June 30, 2026 (Council of the EU, 2024).

Lastly, it is important to define the perspective from which this paper approaches the subject. This paper evaluates the compliance level of sustainability reports of container shipping companies from the standpoint of external users, rather than internal report compilers or internal users.

1.3 Research Design and Methodology

The methodology used in this paper is primarily quantitative content analysis, supplemented by a scoring system and classification analysis method. The quantitative content analysis systematically examines and identifies the attributes of selected content. The scoring system quantitatively measures the compliance level of information identified through the quantitative content analysis, while the classification method supports the data analysis, minimizing the impact of other variables. The 2023 sustainability report serves as the source for content analysis.

1.4 Thesis Structure

The paper is structured into five chapters. Chapter 1 serves as an introduction, providing an overview of the study. Chapter 2 presents a comprehensive literature review, introducing the background, overview, and current research status of ESRS, thereby laying the foundation for the entire paper. Chapter 3 details the methodology, explaining the theoretical foundations of the research and how this paper applies these theories in practice. Chapter 4 focuses on results and analysis, where presents the research findings, explores the underlying reasons, and offers

suggestions based on analysis. Finally, Chapter 5 concludes the paper by summarizing key findings, acknowledging limitations of the study, and proposing directions for future research.

Chapter 2 Literature Review

This chapter initially discusses the importance and development of sustainability reporting. Subsequently, it introduces the contents and relevant information about CSRD and ESRS. Following this, the chapter reviews existing literature on this topic to examine the current state of research and identify any gaps.

2.1 Importance and Development of Sustainability Reporting

This section first addresses the importance of sustainability reporting. This encompasses its general significance in the business world and the specific importance of ESRS standards for container shipping companies. Subsequently, it examines the evolution of sustainability reporting over time.

2.11 Role of Sustainability Reporting in the Corporate Environment

This section explores the various roles that sustainability reporting plays within the corporate environment. For a more structured understanding, different roles of sustainability reporting are categorized into internal and external aspects, as shown in the table below (Table 1).

Table 1 General Role of Corporate Sustainability Reporting

Source: Author

Internal Aspects	External Aspects
Improve Financial Performance	Increase Transparency and Reputation
Enhance Management Practices	Investor Attraction and Corporate Value
	Strategic Differentiation
	Highlight Environmental and Social Efforts
	Compliance with Legal Requirements

Firstly, sustainability reporting enhances company performances and promotes sustainable development. Specifically, it helps improve financial and operational performances. For instance, research found that after adopting sustainability reporting, different companies across various industries tend to experience improvements in metrics such as Return on Assets (ROA), Return on Equity (ROE), and Tobin's Q (TQ) (Abdulla Yusuf Al & Amina, 2021; Amina, 2019). In addition to that, sustainability reporting is critical for companies to maintain social, economic,

and environmental responsibility, which could eventually contribute to the long-term healthy development of the company (Zeynep & Fikret, 2019).

Additionally, companies implementing sustainability reporting cultivate better management practices. It encourages businesses to focus more on environmental, social, and governance issues at the management level, fostering continuous improvement and innovation in these areas (Claus-Heinrich, 2007). As a result, enhanced sustainability reporting often leads to stronger corporate governance frameworks, characterized by better disclosure practices and improved board oversight (Almashhadani & Almashhadani, 2023).

Furthermore, sustainability reporting can improve a company's transparency and reputation, strengthening engagement with stakeholders. Globally, investors, regulators, and consumers are increasingly focused on corporate sustainability performance. By disclosing ESG metrics, sustainability reports highlight corporates' transparency and enhance credibility. This practice allows companies to address stakeholder needs, fostering trust and support (Rezaee, 2016). Consequently, it helps build and maintain trusted relationships between the company and its stakeholders.

Comprehensive sustainability reports also contribute to attracting investors and increasing corporate value. Investors are increasingly seeking companies with strong sustainability practices, driven by rising trends in ESG investment. Detailed sustainability reports attract these investors by demonstrating a company's commitment to sustainable development (Melzattia, 2018). Moreover, research indicates a positive correlation between sustainability reporting and market value. Specifically, companies with high-quality sustainability reports tend to experience higher market value (Lawrence, Thomas, & Yu, 2017). This suggests that investors and the market have given a positive evaluation of companies' sustainability performance.

In addition, engaging in sustainability reporting could be a strategic differentiation for companies. Companies that proactively engage in sustainability reporting often gain a competitive advantage, standing out from competitors who do not disclose or practice sustainability to the same degree (Al-Shaer & Hussainey, 2022). In markets where fewer

companies report on sustainability, this can serve as a strategic differentiation tool, helping businesses stand in a competitive landscape (Higgins, Milne, & Gramberg, 2015).

Companies may also use sustainability reports to highlight environmental and social efforts. As global environmental and social issues like pollution, resource depletion, and inequality become more urgent, it is essential for businesses to demonstrate their efforts in addressing these issues. Sustainability reports are an effective way to achieve this (Zeynep & Fikret, 2019). For example, many companies used these reports to showcase their corporate social responsibility activities, such as donations and STEM (Science, Technology, Engineering, and Mathematics) education initiatives. These efforts not only improve the company's social image but also provide tangible benefits to communities (Victoria, Floros, Georgios, & Konstantina, 2023).

Lastly, as previously discussed, the sustainability reports can help companies meet legal requirements, achieving compliance with reporting standards and regulations, such as the CSRD in the EU and stay ahead of potential new regulations (Hummel & Jobst, 2024).

2.12 Importance of ESRS in the Container Shipping Industry

Chapter 1 touched upon the significance of ESRS for the container shipping industry. It was highlighted that sustainability reports under ESRS offer consistent, comparable, and transparent sustainability information, effectively addressing stakeholders' concerns.

Building on this foundation, the previous section (2.11) examined the general roles of sustainability reporting in the corporate environment. These roles and their importance are equally relevant to container shipping companies, as most of the principles and benefits discussed apply to this industry as well. For instance, sustainability reports prepared in accordance with ESRS can attract green capital, enhance the company's financing capacity, and alleviate the high costs associated with renewable energy. They also assist in regulatory compliance, helping companies adhere to various environmental regulations, including those set by the IMO, among others. Since these are illustrated before, additional examples will not be elaborated further here.

This section introduces two additional aspects specific to ESRS that were not addressed earlier. These aspects distinguish ESRS from general sustainability reporting standards.

Firstly, ESRS offers a more effective method for companies to manage sustainability-related risks and opportunities. Specifically, ESRS mandates that companies conduct a materiality assessment based on the double materiality principle and provides detailed guidelines on how to execute this assessment (more information could be found in Figure A 1). The information identified as material through this process must then be disclosed and analysed further. This includes the material impacts of their operations on society and the environment, as well as how these factors create risks and opportunities for the companies themselves (European Commission, 2022). This systematic identification of significant impacts, risks, and opportunities helps shipping companies to better plan their strategies and manage sustainable performance (European Commission, 2023).

Moreover, ESRS is aligned with global standards and international guidelines, meaning companies adhering to ESRS do not need to prepare a brand-new sustainability report from scratch. Specifically, ESRS aligns with international frameworks such as the Global Reporting Initiative (GRI) and the Sustainability Accounting Standards Board (SASB) among others, ensuring consistency with global sustainability practices (FISMA, 2023). This alignment helps container shipping companies meet both EU and international reporting requirements.

2.13 Evolution of Sustainability Reporting Standards

The evolution of global sustainability reporting standards has been diverse and comprehensive. Prior to the introduction of the ESRS, a variety of reporting guidelines were already providing direction for businesses. These standards had different focus areas: some targeted specific industries, such as those developed by the Sustainability Accounting Standards Board (SASB); others were designed for universal application across all sectors, like the Global Reporting Initiative (GRI) guidelines; and some concentrated on particular aspects of Environmental, Social, and Governance (ESG) matters, exemplified by the recommendations from the Task Force on Climate-related Financial Disclosures (TCFD) and the Taskforce on Nature-related

Financial Disclosures (TNFD).

To illustrate the progression of global sustainability reporting standards and analyze their interoperability with ESRS, several representative guidelines have been selected for in-depth examination. Table 2 provides an overview of these standards.

Table 2 Evolution of Sustainability Reporting Standards

Source: Compiled by Author

Sustainability Reporting Standards	Effective Date/ Initial Release	Organization	Main Purpose and Focus
Global Reporting Initiative Guidelines (GRI Guidelines)	2000 (GRI, 2020)	GRI	Providing a framework for sustainability reporting
Climate Disclosure Standards Board Framework (CDSB Framework)	2010* (CDSB, 2022)	CDSB	The CDSB Framework influenced the TCFD recommendations. It offers a structured method to incorporate environmental and social information into corporate reports (IFRS , 2022).
Integrated Reporting Framework (IR framework)	2013* (IIRC, 2024)	International Integrated Reporting Council (IIRC)	Integrating financial and non-financial information to demonstrate the company's overall value creation
Sustainable Development Goals (SDGs)	2016 (United Nations, 2022)	United Nations	comprise 17 goals aimed at addressing global challenges such as poverty, protecting the planet, and ensuring peace and prosperity for all (United Nations, 2020)
Task Force on Climate-related Financial Disclosures Recommendations (TCFD Recommendations)	2017* (TCFD, 2024)	Financial Stability Board (FSB)/ TCFD	Enable companies to consider climate-related financial risks and opportunities

Sustainability Reporting Standards	Effective Date/ Initial Release	Organization	Main Purpose and Focus
Non-Financial Reporting Directive (NFRD)	2018 (Anderson, 2024)	European Union	Requiring EU large companies to report non-financial information to enhance accountability
Sustainability Accounting Standards Board Standards (SASB Standards)	2018* (SASB, 2024)	SASB	Industry-specific disclosure standards across ESG topics to disclose financially material, decision-useful information (Wikipedia contributors, 2024)
Taskforce on Nature-related Financial Disclosures Recommendations (TNFD Recommendations)	2023* (TNFD, 2023)	TNFD	Help companies to consider nature and biodiversity-related risks and opportunities
IFRS Sustainability Standards	2024 (IFRS, 2023)	International Sustainability Standards Board (ISSB)	Global sustainability-related disclosure standards
European Sustainability Reporting Standards (ESRS)	2024 (FISMA, 2024)	EU (EFRAG)	EU-specific sustainability reporting standards

* Means the date is the initial release day instead of effective date

The table presents 10 representative sustainability reporting standards and frameworks, including GRI, ISSB, and ESRS, arranged chronologically from top to bottom. Since some of these standards are voluntary rather than mandatory, they lack formal effective dates. In such cases, the initial publication date represents their position in the evolutionary timeline.

It is noteworthy that as the development of these standards has progressed, several boards and their subsequent standard revisions have been taken over by the ISSB or IFRS Foundation. The specific details are as follows:

1. **Climate Disclosure Standards Board Framework (CDSB Framework):** On February 1, 2022, the CDSB was consolidated into the IFRS Foundation. The technical

guidance from CDSB now contributes to the evidence base for the IFRS Sustainability Disclosure Standards (IFRS , 2022)

2. **Integrated Reporting Framework (IR Framework):** In November 2021, the IIRC and SASB merged to create the VRF, which was later consolidated into the IFRS Foundation in August 2022 (Wikipedia contributors, 2024; IFRS, 2022). Consequently, the International Accounting Standards Board (IASB) and the International Sustainability Standards Board (ISSB) took on the responsibility of further developing and unifying the Integrated Reporting Framework (IFRS, 2024).
3. **Task Force on Climate-related Financial Disclosures Recommendations (TCFD Recommendations):** After releasing its 2023 status report, the TCFD dissolved, passing its responsibilities to the ISSB without merging into it. The Financial Stability Board (FSB) requested the ISSB to take over the future work on TCFD recommendations (TCFD, 2024). The ISSB's IFRS S2, concerning "Climate-related Disclosures," aligns with TCFD's four core recommendations and eleven suggested disclosures. As a result, companies implementing IFRS S2 will automatically meet the TCFD recommendations (IFRS, 2023).
4. **Sustainability Accounting Standards Board Standards (SASB Standards):** The IIRC and SASB merged to form VRF in November 2021, and VRF was later consolidated into the IFRS Foundation in August 2022 (IFRS, 2022). At the same time, the ISSB took the responsibility for the SASB Standards, committing to maintain and enhance them while encouraging their continued use. The SASB Standards serve as a guide for implementing IFRS S1, which lays out broad requirements for disclosing financial information related to sustainability (IFRS, 2022).

With the merging of these guidelines, the number of existing sustainability reporting standards committees is gradually decreasing. The ESRS currently possesses a high level of interoperability with several of the most representative sustainability standards in the market.

Specifically, ESRS is published based on NFRD, ensuring its core content aligns with NFRD. Furthermore, multiple sustainability standards have already been incorporated into the ISSB. Building on this foundation, ESRS further engaged in discussions with ISSB and GRI. This dialogue, conducted on top of the existing integration, enables ESRS to achieve not only a high level of interoperability with ISSB standards and GRI framework, but also simultaneously establish interoperability with various other standards that have been incorporated into ISSB. (FISMA , 2023). Additionally, through close collaboration between EFRAG and TNFD, ESRS has maintained a strong level of consistency with TNFD recommendations (EFRAG, 2024). Also, ESRS integrated parts of the SDGs into its standards as guidance and voluntary disclosures, facilitating interoperability between ESRS and SDGs (European Commission, 2023). This extensive alignment and integration effort demonstrates ESRS's commitment to creating a comprehensive and widely compatible sustainability reporting standard.

2.2 Overview of CSRD and ESRS

The following sections will first discuss the basics of the CSRD and ESRS, then dive deeper into the main content and framework of the ESRS. Subsequently, the timeline for the ESRS application dates is outlined, highlighting the progressive implementation schedule for companies of different sizes.

2.21 Introduction and Background

The terms CSRD, ESRS, and the European Financial Reporting Advisory Group (EFRAG) are frequently referenced in this paper. Thus, it is essential to first explain the relationships among them.

In brief, the CSRD mandates comprehensive sustainability reporting, the ESRS outlines the specific standards that companies must follow for this reporting, and EFRAG is the independent body responsible for developing these standards.

Specifically:

CSRD (Corporate Sustainability Reporting Directive):

- The CSRD is a directive from the European Union that mandates extensive sustainability reporting requirements for companies. It entered into force on January 2023, and applies from the financial year 2024 onwards (European Commission, 2022).
- This directive aligns with the European Green Deal and aims to enhance the transparency and consistency of corporate sustainability reporting across the EU. (European Commission, 2022)

ESRS (European Sustainability Reporting Standards):

- ESRS are the standardized reporting guidelines that companies must follow under the CSRD.
- Developed by EFRAG, ESRSs cover various ESG issues and are designed aligning with both EU policies and international standards (European Commission, 2022).

EFRAG (European Financial Reporting Advisory Group):

- EFRAG is a private association established in 2001 with the European Commission's encouragement, funded by both the public sector (European Union) and private sector (EFRAG Member Organizations) (EFRAG, 2024).
- It is tasked with the technical development of the ESRS, providing drafts and consulting with stakeholders to refine these standards. (EFRAG, 2024)

Additionally, CSRD and ESRS are significant components of EU sustainable policies and frameworks, and they are closely connected with other regulations. Given their special role, it is crucial to examine in detail how they intersect with other EU policies.

As the EU Green Deal is the cornerstone initiative in the field of sustainable development, it serves as an excellent starting point for analysis. To better understand its structure and key components, Figure 1 below illustrates various elements of the plan. This figure illustrates various elements of the plan, with "financing the transition" standing out as a critical component. Highlighted in blue, this aspect plays a crucial supportive role within the just transition, demonstrating its integral position in realizing the Green Deal.



Figure 1 The European Green Deal

Source: (European Commission & Secretariat-General, 2019)

Within this context of financing the transition, the Green Deal emphasizes the pivotal role of the private sector (European Commission & Secretariat-General, 2019). The plan, introduced in 2019, outlines three main strategies to support and encourage private sector involvement in sustainable finance:

1. Strengthening the foundations for sustainable investment: This involves adopting the EU taxonomy and reviewing disclosure requirements on sustainable data, specifically through the Sustainable Finance Disclosure Regulation (SFDR) and CSRD (European Commission & Secretariat-General, 2019).
2. Creating more opportunities for investors and companies: This strategy aims to make it easier to identify credible sustainable investments. Key initiatives include implementing labels for retail investment products and establishing the EU green bond standard (European Commission & Secretariat-General, 2019).
3. Managing and integrating climate and environmental risks into the financial system: While this is identified as a crucial element, the Green Deal does not provide clear guidance on

the specific frameworks or regulations that will be applied to achieve this goal (European Commission & Secretariat-General, 2019).

Upon closer examination, it becomes apparent that these three strategies outlined in the EU Green Deal align closely with the components of the EU sustainable finance framework (Figure 2). This alignment, while notable, is not surprising. In fact, it is entirely logical given that sustainable finance is defined as finance that supports economic growth and help achieve the climate and environmental objectives of the European Green Deal (FISMA, 2022).

The EU sustainable finance framework



Figure 2 The EU sustainable finance framework

Source: (FISMA, 2022)

Thus, the following figure (Figure 3) illustrates the relationships between CSRD, ESRS, and various policies. This figure effectively explains their background.

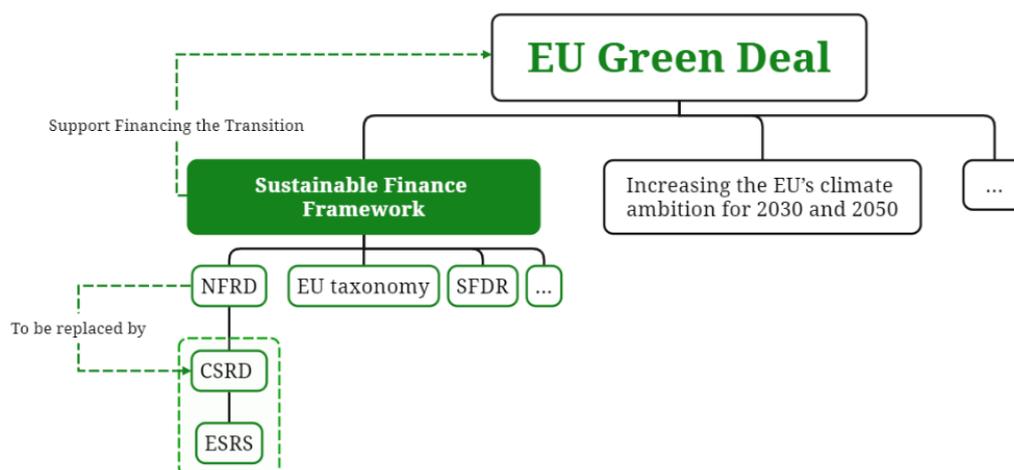


Figure 3 How CSRD and ESRS link with other policies

Source: Author

2.22 Main Content and Framework of ESRS

The ESRS consists of 12 chapters. Chapters 1 and 2 are cross-cutting, providing overall guidelines for the entire ESRSs. The remaining ten chapters each have a different theme, covering various aspects of ESG (see Table 3).

Table 3 Structure of the ESRS sustainability statement

Source: (European Commission, 2023, p. 32)

Part of the management report	ESRS codification	Title
1.General information (GI)	ESRS 2	<i>General disclosures, including information provided under the Application Requirements of topical ESRS listed in ESRS 2 Appendix C.</i>
2.Environmental information	<i>Not applicable</i>	<i>Disclosures pursuant to Article 8 of Regulation (EU) 2020/852 (Taxonomy Regulation)</i>
	ESRS E1	<i>Climate change</i>
	ESRS E2	<i>Pollution</i>
	ESRS E3	<i>Water and marine resources</i>
	ESRS E4	<i>Biodiversity and ecosystems</i>
	ESRS E5	<i>Resource use and circular economy</i>
3.Social information	ESRS S1	<i>Own workforce</i>
	ESRS S2	<i>Workers in the value chain</i>
	ESRS S3	<i>Affected communities</i>
	ESRS S4	<i>Consumers and end-users</i>

Part of the management report	ESRS codification	Title
4.Governance information	ESRS G1	<i>Business conduct</i>

Understanding the ESRS framework requires an examination of the content of its foundational chapters. The analysis starts by Chapter 1, which lays the groundwork for the entire reporting structure.

Chapter 1, General Requirements, details the structure of the ESRS, the drafting conventions, some fundamental concepts, and some generic reporting requirements (European Commission, 2023). Notably, this chapter provides a detailed explanation of the double materiality assessment for the ESRS report, illustrating factors that need to be considered when determining materiality and the general process need to follow when performing the assessment. Additionally, ESRS 1 specifies the placement of the sustainability reporting, requiring its inclusion as a distinct section within the management report. (European Commission, 2023). Another key point is that this chapter mandates the inclusion of disclosures from Article 8 of Regulation (EU) 2020/852, known as the EU taxonomy regulations, within the environmental part of the sustainability statement, and this should be clearly identifiable.

Chapter 2, General Disclosures, mainly discusses the various DRs present in the ESRS standards (since different standards may apply different disclosure requirements), their general-level requirements, and the corresponding application requirements.

Except for the chapters 1 and 2, the remaining ten chapters follow a consistent structure with four main parts. Figure 4 illustrates the standard structure of these chapters, using ESRS S1 "Own Workforce" as an example. The typical structure of each chapter comprises:

1. The objective
2. Interaction with other ESRS
3. Disclosure requirements (DR)
4. Appendixes, primarily consisting of application requirements (AR)

The objective is a brief summary of this chapter, including the issues covered by this standard and how it connects with other relevant frameworks or regulations. The interaction section defines the scope of the standard, helping to avoid potential overlaps with other relevant standards. The DRs and ARs form the main body of the standards, specifically setting out the content of the sustainability statement.

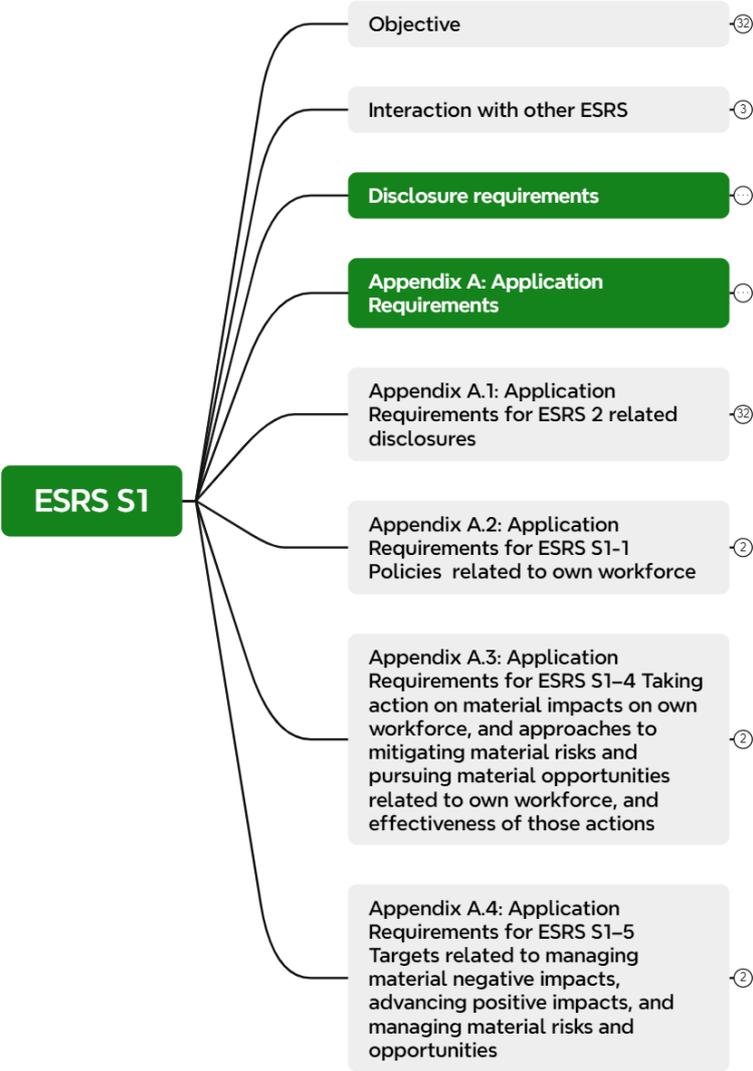


Figure 4 Content Structure of ESRS S1 Own workforce
 Source: Author

The Disclosure Requirements (DR) are further categorized into Basis for Preparation (BP), Governance (GOV), Strategy (SBM), Impact, Risk and Opportunity Management (IRO), and

Metrics and Targets (MT) (European Commission, 2023, pp. 35-37). See the table below (Table 4).

Table 4 Categories of Disclosure Requirements
Source: (European Commission, 2023, pp. 35-37)

Disclosure Requirements	Basis for preparation (BP)
	Governance (GOV)
	Strategy (SBM)
	Impact, risk and opportunity management (IRO)
	Metrics and targets (MT)

Additionally, each category of DR encompasses multiple disclosure topics, as illustrated in Table A 1. Each topic has DRs given in the form of paragraphs. Within these paragraphs, data points are provided for further breakdown of the requirements in paragraphs. The data point represents the smallest unit of disclosure in the ESRS standards.

As for the ARs, they are typically placed in the first appendix. Their primary function is to offer supplementary explanations for the DRs, including examples, format requirement, and other additional details. Generally, each significant DR is accompanied by corresponding ARs. Therefore, the AR generally follows the same content structure as the DR, making it easier to correspond and read.

2.23 Implementation Timeline of ESRS

Compared with NFRD, CSRD covered a much larger number of companies. It included not only the large listed companies, but also part of private companies, as well as listed SMEs, and third country undertakings. For clarity, it is essential to first define the different types of companies.

Table 5 Definition of different types of companies
Source: (FISMA , 2024, p. 12)

Micro-undertakings (Art. 3(1) Accounting Directive*): undertakings which on their balance sheet dates do not exceed the limits of at least two of the three following criteria:
 (a) balance sheet total: EUR 450 000; (b) net turnover: EUR 900 000; (c) average number

of employees during the financial year: 10.
SMEs (Art. 3(1), (2) and (3) Accounting Directive): undertakings which on their balance sheet dates do not exceed the limits of at least two of the three following criteria: (a) balance sheet total: EUR 25 000 000; (b) net turnover: EUR 50 000 000; (c) average number of employees during the financial year: 250.
Large undertakings (Art. 3(4) Accounting Directive): undertakings which on their balance sheet dates exceed at least two of the three following criteria: (a) balance sheet total: EUR 25 000 000; (b) net turnover: EUR 50 000 000; (c) average number of employees during the financial year: 250.
Large groups (Art. 3(7) Accounting Directive): groups consisting of parent and subsidiary undertakings to be included in a consolidation and which, on a consolidated basis, exceed the limits of at least two of the three following criteria on the balance sheet date of the parent undertaking: (a) balance sheet total: EUR 25 000 000; (b) net turnover: EUR 50 000 000; (c) average number of employees during the financial year: 250.

*The Accounting Directive here refers to the Directive 2013/34/EU.

Table 5 is the basis for determining the application date of ESRS for companies. Table 6 presents these criteria in a matrix format to enhance clarity and comparability. To provide a better understanding of these criteria, it's essential to clarify some key terms used in the definitions. "The balance sheet total" refers to the total value of the assets listed under A to E in Table A 2 (European Parliament & Council of the European Union, 2023, p. 9). "Net turnover" is defined as the amounts derived from the sale of products and the provision of services, after deducting sales rebates, value added tax, and other taxes directly linked to turnover (European Parliament & Council of the European Union, 2023, p. 4).

It is important to note that while the numerical thresholds for SMEs, large undertakings, and large groups are identical, the classification criteria differ. Specifically, SMEs must not exceed

two of the three thresholds, whereas large undertakings and large groups must exceed at least two of these thresholds.

Table 6 Criteria of different types of companies
Source: (FISMA, 2024, p. 12)

Classification	Balance Sheet Total (EUR)	Net Turnover (EUR)	Average Number of Employees
Micro-undertakings (Art. 3(1) Accounting Directive)	450,000	900,000	10
SMEs (Art. 3(1), (2) and (3) Accounting Directive)	25,000,000	50,000,000	250
Large undertakings (Art. 3(4) Accounting Directive)	25,000,000	50,000,000	250
Large groups (Art. 3(7) Accounting Directive)	25,000,000	50,000,000	250

For different companies, the application dates vary. The flowchart below (Figure 5) details the specific timelines of ESRS that different types of companies need to apply under various conditions.

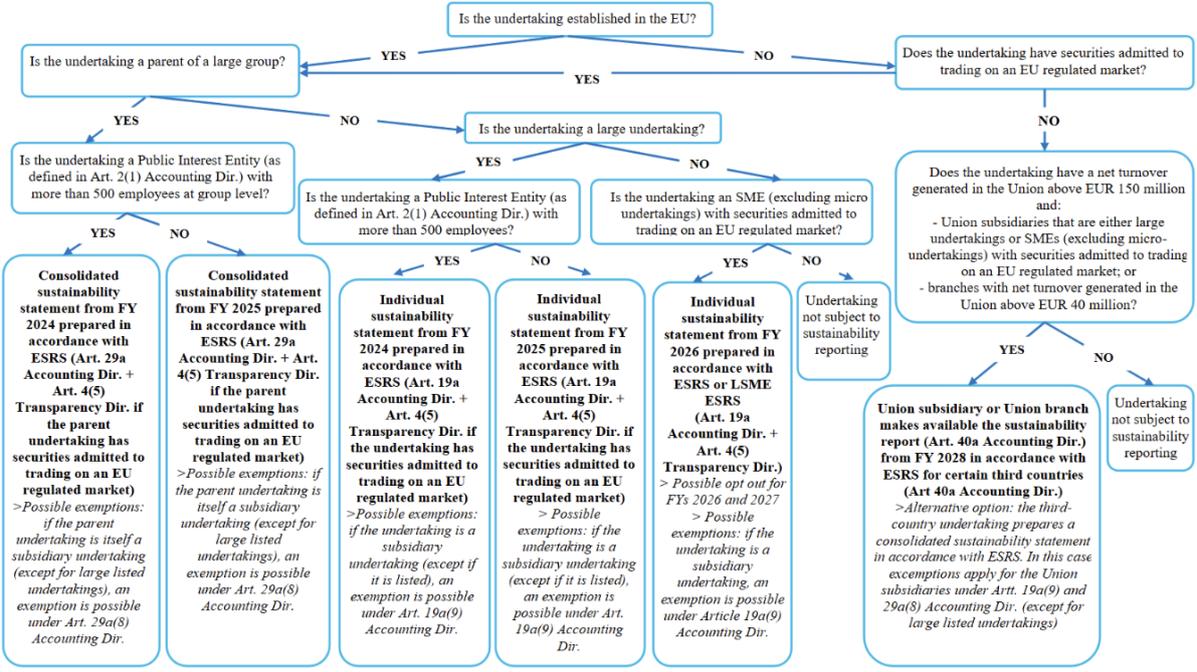


Figure 5 How to identify the applicable ESRS application date
Source: (FISMA, 2024, p. 12)

This decision-making process begins by assessing whether the undertaking is established in the

EU. If it is, the process continues to evaluate whether the undertaking is a parent of a large group. For those that are, further scrutiny is applied to determine if they qualify as a Public Interest Entity (PIE) with more than 500 employees. Such entities are required to prepare a consolidated sustainability statement starting from the fiscal year 2024 especially if their securities are traded on an EU-regulated market. If they do not meet the PIE criteria, the requirement to prepare the statement is deferred to the fiscal year 2025.

If the undertaking is not a parent of a large group, the next step is to determine if it qualifies as a large undertaking. Large undertakings that are also PIEs with over 500 employees must prepare an individual sustainability statement from the fiscal year 2024. Those that do not meet the PIE criteria must comply by the fiscal year 2025. If the undertaking is neither a large undertaking nor a PIE, the process checks if it is a Small and Medium-sized Enterprise (SME) with securities admitted to trading on an EU-regulated market. Such SMEs are required to prepare an individual sustainability statement starting from the fiscal year 2026.

For undertakings not established in the EU, the process examines whether they have securities admitted to trading on an EU-regulated market. If they do, they follow the same reporting obligations as those established in the EU. If not, the process considers whether the undertaking has a net turnover generated in the Union exceeding EUR 150 million. If so, it checks if the Union subsidiaries are either large undertakings or SMEs (excluding micro-undertakings) with securities admitted to trading on an EU regulated market or branches of a third-country undertaking with a net turnover in the Union over EUR 40 million. Such entities must prepare a sustainability statement from the fiscal year 2028. If these conditions are not met, the undertaking is not subject to sustainability reporting. This structured approach ensures that undertakings are aware of their specific reporting obligations based on their size, market presence, and financial metrics.

In this process, the “established” in the first step refers to having headquarters in the EU. Subsidiaries of a third-country company that are established within the EU are not considered "established in the EU." Additionally, PIEs encompass various types of companies (specific

details can be found in Article 2 (1) of the Accounting Directive), among which listed companies must be listed within the EU, and those listed outside the EU do not fall under the definition of PIE as per this context.

For clarity, Table 7 summarizes these results.

Table 7 Timeline for the application of ESRS
Source: (FISMA , 2024, p. 13)

Category	Financial Year 2024 (reporting in 2025)	Financial Year 2025 (reporting in 2026)	Financial Year 2026 (reporting in 2027)	Financial Year 2027 (reporting in 2028)	Financial Year 2028 (reporting in 2029)
Large undertakings which are PIEs (including third-country issuers) > 500 employees on average during the financial year	Individual sustainability statement (ESRS)				
PIEs (including third-country issuers) that are parent undertakings of a large group > 500 employees on average on consolidated basis during the financial year	Consolidated sustainability statement (ESRS)				
Large undertakings (including third-country issuers) that are not “PIEs > 500 employees on average during the financial year”	N/A	Individual sustainability statement (ESRS)			

Category	Financial Year 2024 (reporting in 2025)	Financial Year 2025 (reporting in 2026)	Financial Year 2026 (reporting in 2027)	Financial Year 2027 (reporting in 2028)	Financial Year 2028 (reporting in 2029)
Parent undertakings of a large group (including third-country issuers) that are not “PIEs > 500 employees on average on a consolidated basis during the financial year”	N/A	Consolidated sustainability statement (ESRS)	Consolidated sustainability statement (ESRS)	Consolidated sustainability statement (ESRS)	Consolidated sustainability statement (ESRS)
Listed SMEs, SNCIs, captive (re)insurance undertakings (including third-country issuers)	N/A	N/A	Individual sustainability statement (ESRS or LSME ESRS)*	Individual sustainability statement (ESRS or LSME ESRS)*	Individual sustainability statement (ESRS or LSME ESRS)
CSRD subsidiaries (or, in the absence, EU branches with net turnover in the Union > EUR 40 million) of third-country non-listed undertakings with net turnover in the Union > EUR 150 million	N/A	N/A	N/A	N/A	Sustainability report (ESRS for certain third-country undertakings or ESRS)

* May opt out: may choose not to follow ESRS for the two years temporarily

2.3 Current Status of ESRS adaptation

2.31 Challenges and Difficulties of ESRS Adaptation

The container shipping industry currently faces several challenges in applying the ESRS. These challenges can be categorized into three main areas: high application cost, difficulties in data

collection, and the partial applicability of current ESRS guidelines.

Cost and Resource Constraints

The ESRS disclosure requirements are highly stringent, making it difficult for shipping companies to meet these high standards. Specifically, ESRS necessitates extensive and high-granularity disclosures, some of which require advanced levels of expertise and substantial resources to implement. Moreover, in addition to these already demanding requirements, companies may need to allocate further resources to address existing shortcomings in their practices. This additional investment is to ensure that the disclosed information is fully compliant with ESRS standards, thereby safeguarding business relationships and corporate reputation (Baekmark, 2024). Consequently, the application cost is relatively high.

Data Collection and Reporting

The ESRS demands significant data from companies, for example, the reporting of Scope 3 emissions. As a result, small and medium-sized shipping companies, which generally have insufficient sustainable information collection practices, face significant pressure to quickly improve their data collection systems and enhance their reporting capabilities to meet ESRS requirements. Additionally, considering that shipping companies are dealing with an enormous amount of meaningless data, the difficulty of data collection is further increased. This situation compounds the challenges these companies face in complying with ESRS guidelines (Baekmark, 2024).

Partial Applicability of Current ESRS Guidelines

The present ESRS guidelines are standardized and universal, lacking the specificity needed for particular sectors. Consequently, these guidelines may not be entirely suitable for the container shipping industry (Zhou et al., 2021).

2.32 Review of Existing Research on CSRD and ESRS

The literature review employed a systematic approach to identify and select relevant research

on CSRD and ESRS. The primary sources for literature retrieval were the Erasmus University library database and Google Scholar. To ensure the relevance and currency of selected sources, several search criteria and filters are applied.

The search strategy utilized key terms such as "CSRD," "ESRS," "current research status," and "application of ESRS" to identify pertinent studies. The selection was limited to English-language publications, excluding literature in other languages such as German and Polish. Given the recent adoption of CSRD in 2023 and the release of ESRS in the same year, this research primarily focused on literature published from 2022 onwards to capture the most up-to-date research and discussions.

While citation count was considered as one criterion for assessing the impact and relevance of papers, due to the recency of the topic, many valuable studies might not yet have accumulated significant citations. Therefore, citation metrics were used as a supplementary factor rather than a primary determinant in the selection process.

Following the literature selection, a careful review of the papers' content was conducted to identify common themes and research focuses. Based on the research directions and types, these studies can be categorized into three main areas: the impact of ESRS and CSRD, ESRS/CSRD implementation studies, and comparisons of standards.

Impact of ESRS and CSRD

This category mainly explores the different impact of ESRS and CSRD, providing a foundation for a comprehensive understanding.

Fornasari and Traversi (2024) conducted a literature review and analysis to examine how ESRS and CSRD promote the integration of ESG factors into corporate strategies, enhance transparency and stakeholder trust, and potentially influence global reporting standards. The study found that these standards not only internalize sustainable development as a core part of corporate strategy but also redefine sustainability as key to long-term corporate resilience and success. The research suggests that the European non-financial information disclosure model

has the potential to establish a global benchmark for sustainability reporting standards. However, the study lacks specific case analyses, making it challenging to demonstrate the actual impact of CSRD and ESRS on specific industries.

Mezzanotte (2024) used literature research and policy interpretation method to explore how companies conduct double materiality assessments to determine reportable information and develop stakeholder engagement policies. The study indicates that CSRD implementation will provide more and better sustainability-related information for reporting companies, stakeholders, and markets, prompting companies to adjust their business strategies and practices to enhance sustainability performance. However, the research also highlights some legal risks and challenges in implementing impact materiality assessment that companies should be aware of. Despite this, the lack of specific case analyses may limit understanding of actual market conditions and company practices.

Also, using literature review, policy analysis, and empirical research, Odoša and Marošević (2023) analyzed CSRD's expected contribution to economic and social sustainable development and potential challenges in its practical application. The study suggests that CSRD will strengthen existing European corporate sustainability reporting rules, supporting the European Green Deal objectives and the EU's transition to a sustainable economy and society.

Scamans (2024) used content analysis to study how ESRS considers company stakeholders and addresses the interests and concerns of different stakeholder groups, as well as the extent to which ESRS promotes transparency and accountability. The research found that ESRS considers company stakeholders to some extent. However, ESRS shows an imbalance in considering different stakeholder groups, with a higher focus on environmental concerns. Furthermore, the lack of clear guidance in ESRS for setting targets specific to different stakeholder groups hinders investors and other stakeholders from effectively comparing and assessing different companies' actions and performance.

Falkenberg, Schneeberger, and Pöchtrager (2023) combined literature review, sustainability report analysis, and expert interviews to study the contribution of agricultural and food

companies to the circular economy in sustainability reporting, and the significance of CSRD and EU taxonomy in promoting it. The research explored how companies communicate information about the circular economy, and how CSRD and taxonomy regulations change circular economy communication based on GRI. The study found that large agricultural and food companies have gradually increased their focus on the circular economy, but participation levels and goal-setting vary among companies. CSRD and taxonomy regulations will significantly expand future communication and reporting requirements for the circular economy, potentially bringing additional reporting burdens.

ESRS/CSRD Implementation Studies

This category focuses on the implementation of ESRS and CSRD in specific industries or regions. These studies use case analyses to provide detailed insights into the practical application of ESRS and CSRD, assisting in understanding about challenges and opportunities faced by different sectors and regions.

Nõmmela and Kõrbe Kaare (2022) combined literature review and framework design to explore in depth how to integrate ESRS principles into policy-making frameworks and sustainability maturity models in the maritime sector to support sustainable development. The study proposed policy frameworks and methods to support sustainable development in the maritime sector, including dividing the maritime sector into different economic sectors, adopting cluster methods to support implementation, and coordinating management through a multi-layered structure of local maritime governance. The research also proposed a sustainable development maturity model and analyzed the reporting results of Estonian maritime companies. However, the study did not clearly state the data sources and acquisition methods, affecting its reproducibility and verifiability.

Based on desk research, Próchniak and Płoska (2023) analyzed the preparedness of WIG-20 Warsaw Stock Exchange listed companies under EU sustainability reporting standards, with a particular focus on whether governance disclosures meet EFRAG's draft requirements. The study found that companies' disclosure practices and levels were insufficient to meet the draft

standards proposed by EFRAG. Even the best-performing market representatives with positive attitudes towards sustainability were not fully prepared at the strategic level, lacking both sufficient data and the tendency to disclose certain matters. However, given that the data in the article is up to 2021, some conclusions may have become outdated.

Broniewicz, Jastrzębska, and Lulewicz-Sas (2024) used content analysis to assess the environmental disclosure of 23 Polish joint-stock banks in compliance with ESRS. The study found that these banks had deficiencies in environmental disclosure and did not fully comply with ESRS guidelines. Specifically, disclosures were most frequent in the "climate" area, while disclosures in the "biodiversity and ecosystems" area were the least frequent. However, the study only focused on environmental aspects and did not fully demonstrate the compliance level of ESRS.

Primec and Belak (2022) conducted a multiple case study on Slovenian companies' compliance with non-financial reporting directive requirements. The study evaluated the adequacy and appropriateness of non-financial reports both quantitatively and qualitatively. Findings indicated that Slovenian companies generally performed well in non-financial reporting, particularly given the new mandatory reporting regulations. However, some companies showed deficiencies in implementing age and gender diversity policies. The study's small sample size (11 companies) may limit the generalizability of these findings to the broader Slovenian market.

Comparison of Standards

This category primarily compares the work of different standard-setting bodies in sustainable reporting standards. It explores the development trends in global sustainability reporting frameworks and analyses potential synergies among different institutions.

Based on public document analysis, Giner and Luque-Vílchez (2022) studied the progress and future prospects of the EU in setting sustainable development reporting standards and compared the progress of EC/EFRAG and IFRS Foundation in this field. The study found that EC/EFRAG and IFRS Foundation have taken different approaches to setting sustainable development

reporting standards, forming different views. EC/EFRAG took a broader perspective, while IFRS Foundation focused more on the needs of investors and creditors. Despite the differences, the research points out that there is potential for cooperation between the two, potentially establishing a standard system based on global benchmarks. However, the study did not delve into the potential political conflicts in the standard-setting process and their impact on the future of sustainable development reporting.

Based on the aforementioned research, several gaps have been identified. For instance, studies on companies have mostly focused on publicly listed companies within the European Union, with little attention given to various company sizes. Additionally, there is a scarcity of studies focusing on specific industries, particularly industry-based research. As a result, this paper aims to contribute to existing research gaps by examining the compliance level of ESRS in the container shipping industry.

Chapter 3 Methodology

This chapter primarily introduces the methodology employed in this paper. Initially, the methodology review presents the theoretical foundation of quantitative content analysis. Subsequently, the specific implementation of this method to address the research questions in this study is described, along with the data collection and analysis process utilized in this paper.

3.1 Methodology Review

Structurally, this section starts by explaining the basic concepts and classifications of content analysis. It then proceeds to discuss the assumptions and theoretical framework underpinning this methodology.

3.11 Introduction of Content Analysis Method

Content analysis is a research methodology used to systematically examine the content of communication. By identifying and quantifying particular words, themes, or concepts within texts or sets of texts, researchers can infer details about the messages, the authors, the audience, and the context in which the communication takes place (Anastasiya, 2022; Kimberly & Anup, 2015). This method is versatile and can be applied to various forms of communication, such as written texts, transcribed speech, visual media, etc (Kimberly & Anup, 2015). Through systematic analysis of specific content, researchers can uncover underlying patterns, characteristics, and other useful information.

Content analysis was initially employed in the field of communication sciences, emerging as a systematic method for examining the content of communication, particularly within media studies (Anastasiya, 2022). This method grew in importance with the rise of mass media, such as newspapers in the 19th century and electronic media in the 20th century, spurring its further development and dissemination (Weare & Wan-Ying, 2000). The evolution of content analysis has led to both qualitative and quantitative approaches (Prasad, 2019).

3.12 Types of Content Analysis Method

Qualitative Content Analysis

Qualitative content analysis involves the systematic categorization and interpretation of textual

data to uncover underlying meanings and patterns. This approach is more flexible and interpretive compared to its quantitative counterpart (Forman & Damschroder, 2007; White & Emily, 2006). It is extensively employed in nursing, social sciences, and other disciplines where understanding the context and deeper meanings of the text is essential (Elo & Kyngäs, 2008; Forman & Damschroder, 2007). In more recent times, the advent of computer-aided content analysis has significantly transformed the field, allowing for more sophisticated and large-scale analyses (Wilfried & Tarnai, 1999). The rapid technological advancement has made it easier to analyze digital content more effectively, presenting opportunities and challenges for researchers (Weare & Wan-Ying, 2000).

Quantitative Content Analysis

On the other hand, quantitative content analysis involves a systematic, objective, and measurable examination of message attributes. It centers on the frequency count and measurement of specific words, phrases, or concepts within a text (Kimberly & Anup, 2015). This method is commonly used in media studies, political communication, and other fields that aim to quantify the presence of certain elements within large datasets (Kimberly & Anup, 2015). In Information Systems research, for example, Qualitative Comparative Analysis has been applied to study unstructured text data, including emails, blogs, and academic publications. Methods such as Latent Semantic Analysis and data mining help identify key topic areas and visualize how these topics develop over time (Indulska, Hovorka, & Recker, 2012).

To put it simply, Quantitative Content Analysis emphasizes counting and measuring, whereas Qualitative Content Analysis is more about interpreting and understanding (Luo, 2023). This paper aims to quantify the compliance of companies' sustainability reports and ultimately provide a compliance level expressed as a percentage. For this reason, the quantitative content analysis approach was chosen.

3.13 Assumptions and Theoretical Framework

Content analysis is a systematic and objective research methodology with certain assumptions and theoretical foundations that derived from its research objectives. These assumptions and

theoretical foundations enhance the method's scientific credibility and facilitate its further application. Researchers should be familiar with these prerequisites in order to ensure that they are suitable for their research. Below are the most critical ones (see Table 8).

Table 8 Theoretical Foundations and Assumptions
Source: Compiled by Author

Foundations and Assumptions	Illustration
Text as Information Source	Content analysis operates under the premise that texts (including various forms of communication content) are a rich data source capable of revealing information about specific phenomena (Econometrics Community, 2023).
Contextual Relevance	The analysis extends beyond the surface meaning of the text to encompass the background in which the communication occurs. When conducting an analysis, researchers need to consider the creators of the text, the audience, and their backgrounds to understand the text comprehensively (Econometrics Community, 2023).
Media Information Reflects Attitudes	Researchers assume that the information provided by the media can significantly reflect the attitudes of the communicators on specific issues. For example, analyzing a newspaper's coverage of women's issues can infer the newspaper's stance and attitude towards this topic (Econometrics Community, 2023).

Foundations and Assumptions	Illustration
Interpretation of Meaning	Particularly in qualitative content analysis, it is assumed that researchers are capable of interpreting underlying meanings, themes, and patterns within the text (Hurst, 2023).

Furthermore, for each research project, there is a generally accepted theoretical framework for designing the Quantitative Content Analysis. This framework is presented as follows:

1. Formulate the Research Question

The research should begin by clearly defining the research question and providing theoretically effective assumptions. This will lay the foundation for effective coding in later stages. The term "coding" is further explained in step 5 (Rourke & Anderson, 2004).

2. Select the Content for Analysis

Based on the research question, it is essential to determine the specific material to analyze. This process involves considering the type of content (e.g., blogs, social media, or newspapers), developing content inclusion criteria (e.g., specific events or products), and determining certain parameters like time or placement (Paperpile, 2022). If the number of texts that meet the specified criteria is relatively small, it may be feasible to conduct a comprehensive analysis of the entire set. Conversely, when faced with a substantial volume of texts, the researcher can opt to analyze a select sample that is representative of the larger body of work (Luo, 2023). At this stage, researchers should ensure that the selected text or content is closely relevant to the research questions (Paperpile, 2022).

3. Select the Data for Coding

At this stage, researchers should first break the content into manageable units, a process known

as "unitizing." They need to decide how to divide the text, which can be split into sentences, paragraphs, or even smaller segments like phrases or words (Coe & Scacco, 2017).

In some cases, researchers can analyze every unit within a corpus, essentially conducting a complete census of the relevant content. This method eliminates the need for inferential statistics and allows researchers to make more confident assertions. However, due to time and resource constraints, performing a full census is often impractical or impossible (Coe & Scacco, 2017). Therefore, researchers often rely on sampling methods to conduct their studies. Methods like probability sampling, such as random sampling or stratified sampling, are generally preferred. This approach allows researchers to reach meaningful conclusions without having to analyze every single text, while also ensuring the validity of the data (Paperpile, 2022).

4. Develop a Coding Scheme

At this stage, researchers need to develop a coding manual that clearly defines the features and categories requiring attention. This manual should also offer explicit coding standards and illustrative examples. This helps in systematizing the coding process, ensuring consistent understanding among different coders, and reducing the influence of subjectivity (Coe & Scacco, 2017).

Reliability is of great significance in this phase. To achieve that, researchers must systematically manage the coding process. This involves creating a precise illustration and offering clear coding guidelines, helping reach consistent conclusions when analyzing the same text (Coe & Scacco, 2017).

5. Code the Content

The process of "coding" is often described as the central activity in quantitative content analysis. Essentially, coding involves the systematic observation and quantification of text patterns. This task can be performed manually by individuals or conducted through computer programs (Coe & Scacco, 2017). More specifically, coding involves the identification of key concepts, words, or phrases within a text and their subsequent assignment to predefined categories based on

established classification standards outlined in the coding manual (Coe & Scacco, 2017).

6. Analyze the Results

After completing the coding, researchers shall analyze the coded data using appropriate statistical techniques to uncover patterns, trends, and relationships within the content. This step entails quantifying the coded data and interpreting the results in the context of the research question (Huxley, 2020). Finally, researchers should present the findings and conclusions, identify gaps in the research, and suggest areas for future improvement.

3.2 Quantitative Content Analysis

This section explains the specific implementation of this method in the current study.

3.2.1 Application of Quantitative Content Analysis in Sustainability Reports

Following the generally accepted theoretical framework for Quantitative Content Analysis, the research questions were first devised. The analysis content comprises the 2023 sustainability reports of the selected container shipping companies, as further elaborated in section 3.4 Data Collection and Screening.

The manageable units are primarily sentences or paragraphs from the report. In some cases, such as when identifying the presence of tables, the unit may be the table itself or individual cells within the table. Given the specific nature of the research questions, the entire reports are reviewed without employing sampling methods.

In order to systematically assess the compliance of container shipping companies' sustainability reports with the ESRS, it is essential to develop a robust coding scheme. A coding scheme serves as a guidebook for researchers, outlining the classifications and criteria for categorizing specific content into predetermined categories for a particular research project. Applying this principle to the current study and considering its unique characteristics, it is proposed that the ESRS guidelines themselves can effectively function as the coding scheme.

ESRS provides a clear framework with tiered requirements, as discussed in section 2.22. It

specifies the information required and its characteristics for each category. This structure allows us to understand precisely what information characteristics are expected under each category. Therefore, ESRS itself fulfils the requirements of a coding manual.

The following stage in the methodology entails coding the content. As mentioned in the methodology review, coding can be done either by machine or manually. In this research, due to the current lack of a uniform format and framework for sustainability reports in container shipping companies, which makes them difficult to process by machine, a manual review and coding process was adopted.

In this paper, "coding the content" specifically refers to examining the sustainability reports and categorizing content that meets ESRS requirements into corresponding disclosure topics. Each item is then assessed for its specific compliance level according to the relevant DRs. Considering that this part is the core of the methodology, it will be elaborated in detail in the following sections.

Lastly, the analysis and results are presented in Chapters 4 and 5.

3.22 Scoring System

To quantitatively analyze the compliance level, a scoring system based on a weighted average method was developed.

In this approach, the disclosure topic is used as the smallest unit of analysis for scoring. For instance, a typical disclosure topic would be "Disclosure Requirement E1-1 – Transition plan for climate change mitigation" (European Commission, 2023, p. 69). This paper evaluates the compliance level of each disclosure topic and sets the number of datapoints within each topic as weights in the calculations.

The scoring process involves the following steps:

1. Assessing the compliance level of each disclosure topic
2. Counting the number of datapoints under each topic

3. Calculating a weighted average score using the compliance levels and datapoint counts

In the review process of companies' sustainability reports, each disclosure topic (unit of analysis) is evaluated on a scale of 0 to 4 points, with scores of 4, 3, 2, 1, and 0 points corresponding to decreasing levels of disclosure quality.

The specific evaluation criteria are shown as follows (Table 9):

Table 9 Grading Criteria
Source: Author

Points	Criteria
0	No mention of relevant ESRS requirements
	Absence of any sustainability-related data or information
1	ESRS-related topics are briefly mentioned, but content is extremely limited
	Lack of specific data, examples, or detailed explanations
	Most content remains superficial, without substantial information
	Unclear connection to ESRS standards
2	Partial coverage of ESRS requirements, but not comprehensive
	Some specific data and examples provided, though limited in quantity
	Missing key indicators or information
	Descriptions of certain topics are vague and lack depth
	Unclear correspondence with ESRS standards
3	Covers most ESRS requirements
	Provides relatively comprehensive data and examples
	Addresses most key indicators and information
	Detailed descriptions and analysis for most topics
	Fairly clear alignment with ESRS standards
	Some areas may have insufficient information or lack analytical depth
4	Comprehensive coverage of all relevant ESRS requirements
	Provides thorough data, examples, and analysis
	Complete presentation of all key indicators and information
	In-depth description, analysis, and evaluation for each topic
	Very clear correspondence with ESRS standards
	Demonstrates high transparency

For weights of each unit analysis, the EFRAG Implementation Guidance tables are used as the basis (EFRAG, 2024). The table provide a detailed breakdown of data points under each chapter and disclosure topic. The number of data points under each topic is counted as their weights.

Notably, the ESRS uses specific terms to distinguish different levels of disclosure obligations: “shall” and “may.” (a) "Shall disclose" indicates that the provision is mandatory, while (b) "May disclose" suggests voluntary disclosure to promote good practice (European Commission, 2023). This paper focuses on assessing the compliance level during the early stages of ESRS application, rather than the advanced level of sustainability reporting. Consequently, datapoints tagged with "may" are excluded from the assessment and weighting.

Given that presenting the data points for each individual topic would result in an excessively large table, the data points for each chapter are displayed instead. The underlying principle remains the same. The total data points of each chapter are illustrated as the table below shows (Table 10).

Table 10 Data Points of Each Chapters
Source: (EFRAG, 2024)

ESRS	Total
ESRS 2	127
E1	187
E2	44
E3	27
E4	54
E5	42
S1	127
S2	47
S3	45
S4	44
G1	39
TOTAL	783

It is important to highlight that the EFRAG Implementation Guidance tables do not include statistical data for ESRS 1, as they state that ESRS 1 does not contain substantive disclosure requirements. However, it is observed that ESRS 1 includes formatting and placement requirements. Therefore, this paper will also check the format and placement of sustainability reports according to ESRS 1. Specifically, the following aspects are checked:

1. Is the sustainability report included as a clearly identifiable separate section within the

management report?

2. Is the report structured and sequentially structured according to the four main parts: general information, environmental information, social information, and governance information?
3. Are the disclosures required under Article 8 of the Taxonomy Regulation presented in an easily identifiable subsection within the environmental chapter?

However, these checks will not be included in the scoring system but merely as a supplementary.

The final scores will be calculated using the following formulas, with the results presented as percentages.

Specifically:

$$S_i = \frac{\sum_{j=1}^{m_i} W_{ij} S_{ij}}{4 \times \sum_{j=1}^{m_i} W_{ij}}$$

Where:

The factor of 4 in the denominator reflects that each disclosure topic has a maximum score of 4.

$$S_k = \frac{\sum_{i=1}^{n_k} \left(\sum_{j=1}^{m_i} W_{ij} S_{ij} \right)}{4 \times \sum_{i=1}^{n_k} \left(\sum_{j=1}^{m_i} W_{ij} \right)}$$

Where:

n_k is the total number of chapters in the respective aspect k (E, S, G or GI).

$\sum_{i=1}^{n_k} \left(\sum_{j=1}^{m_i} W_{ij} S_{ij} \right)$ is the sum of weighted scores across all topics in all chapters of the aspect k .

$\sum_{i=1}^{n_k} \left(\sum_{j=1}^{m_i} W_{ij} \right)$ is the sum of weights across all topics in all chapters of the aspect k .

$$S_{\text{Overall}} = \frac{\sum_{k \in \{E, S, G, GI\}} \sum_{i=1}^{n_k} \left(\sum_{j=1}^{m_i} W_{ij} S_{ij} \right)}{4 \times \sum_{k \in \{E, S, G, GI\}} \sum_{i=1}^{n_k} \left(\sum_{j=1}^{m_i} W_{ij} \right)}$$

Where:

$\sum_{k \in \{E, S, G, GI\}} \sum_{i=1}^{n_k} \left(\sum_{j=1}^{m_i} W_{ij} S_{ij} \right)$ is the sum of weighted scores across all topics in all chapters of all aspects.

$\sum_{k \in \{E, S, G, GI\}} \sum_{i=1}^{n_k} \left(\sum_{j=1}^{m_i} W_{ij} \right)$ is the sum of weights across all topics in all chapters of all aspects.

Variable Explanation Summary:

C_i : The i -th chapter.

n : The total number of chapters in each aspect (E, S, G or GI).

W_{ij} : The weight for the j -th disclosure topic in the i -th chapter.

U_{ij} : The j -th disclosure topic in the i -th chapter.

m_i : The number of disclosure topics in the i -th chapter.

s_{ij} : The score of the j -th disclosure topic in the i -th chapter.

S_i : Weighted average score for the i -th chapter.

S_k : Weighted average score for one of the aspects ($k \in \{E, S, G, GI\}$),

where k represents a specific aspect.

S_{Overall} : Overall weighted average score across all aspects (E, S, G, GI).

3.23 Practical Assumptions

Based on the general scoring system framework, adjustments are made for some immaterial topics and conditional data points.

Since ESRS disclosure is based on materiality, companies can choose not to disclose all DRs under that topical standard if deemed immaterial in their materiality assessment (European Commission, 2023). Therefore, if a company clearly categorizes sustainability matters as important or unimportant, the weights are adjusted according to their classification. The weights are adjusted on a chapter-by-chapter basis. If deemed unimportant, the entire chapter is marked as not applicable.

If a company doesn't use the double materiality principle for materiality assessment, their identified material sustainability matters may not align with those provided by ESRS (Table A 4). In such cases, the general scoring framework is applied without adjusting chapter weights. If a company doesn't indicate importance or provide guidance, this paper defaults to treating it as important for review.

Additionally, for conditional DRs, the corresponding weight is lowered if certain conditions don't apply to the company. However, as external users, it's challenging to accurately determine whether a condition applies. Therefore, all the adjustments are either minor or applied uniformly across all companies.

3.3 Analysis Methods

The selection of data analysis methods is primarily based on this paper's research questions. In addition to analyzing company compliance data, a classification analysis method is employed to explore potential factors influencing differences in company compliance levels. Four quantifiable and relevant variables were selected as classification indicators: Number of Group Employees, Company Scale in TEU (Twenty-foot Equivalent Unit), Expected Reporting Time, and Listing Status. These indicators were chosen because they are both easily quantifiable and potentially associated with a company's compliance level.

Data on these four indicators were collected for each company and then categorized and

consolidated them based on data characteristics. This classification method enables the use of tools like Excel pivot tables to visually present compliance situations for different categories of companies, facilitating the analysis of potential relationships between these factors and compliance levels.

Specifically, the ESRS compliance results data for seven shipping companies were first organized. A classification summary table was created using Excel, and pivot tables were subsequently applied for in-depth analysis.

For a comprehensive analysis of compliance differences among companies, a data matrix was constructed with company names as row headers and scores for GI, E, S, G dimensions, along with the overall score, as column values to represent the holistic compliance situation.

Furthermore, this paper conducted separate cross-company comparisons for the four aspects: GI, E, S, and G, aiming to identify potential patterns or trends. When investigating the causes of compliance level differences, this paper group companies based on previously determined classification indicators. The average scores are subsequently calculated for companies within each group across all aspects and presented them visually through charts to explore possible systematic differences between groups with different characteristics, thereby discovering potential reasons.

Subsequently, an analysis was conducted to identify areas with insufficient disclosure and determine the most significant deficiencies. The average score of the 7 companies was calculated and analyzed at 3 different levels: the 4 aspects, 11 chapters, and corresponding disclosure topics.

The 4 aspects were first examined comprehensively, followed by a detailed analysis of the chapters within each aspect. When checking the chapters, this paper selected those with the lowest scores to further unfold into disclosure topics. This approach facilitated the identification of the most insufficient disclosures and their reasons. Based on this investigation, suggestions are proposed to improve ESRS compliance levels.

It is important to note that, since only seven companies were selected and other potential variables were not controlled to ensure complete consistency, direct causal relationships cannot be established. The analysis and exploration of causes in this paper provide only a preliminary observation.

3.4 Data Collection and Screening

To address the research questions and enhance relevance, the selection of shipping companies focused on those falling within the first two phases of the ESRS application timeline. Specifically, the study targeted companies required to publish their initial ESRS sustainability reports in 2025 and 2026. These companies were chosen due to their more urgent reporting deadlines, making their current sustainability statements particularly relevant to this study. To this end, their 2023 sustainability reports are used as raw material for analysis.

To begin the selection process, the study first needs to identify a list of container shipping companies. For this purpose, reference was made to the Alpha Liner TOP 100 ranking, published in August 2024, which lists the world's top 100 container shipping companies based on their TEU capacity (Alphaliner, 2024). This ranking served as the initial pool of companies from which the selection criteria could then be applied.

The company selection process then proceeded as follows. Following the flowchart analysis of Figure 5, the establishment of these companies in the EU was first determined by examining their headquarters' locations. From the top 100 list, 13 companies established in the EU were identified. However, further investigation revealed that 5 companies had no sustainability reports, and one company had only released its 2022 sustainability report. Consequently, only 7 companies met all the requirements.

After determining the selected companies, their data were collected and organized under four classification indicators. The employee headcount data was sourced from company sustainability reports and official websites. Company scale information came from the Alpha Liner TOP 100 ranking. Whether a company is publicly listed was mainly determined from official websites and online searches. Expected reporting times were primarily obtained from

company sustainability reports, and where not available, judgments were made based on companies' information and the decision-making diagram in Figure 5.

These seven companies and their data under the classification indicators are:

Table 11 Selected Companies
Source: Author

Company	Number of Group Employees	Company Scale (TEU)	Expected Reporting Time	Listing Status
MSC	91,967	6,083,395	2026	Not Listed
Maersk	108,934	4,367,915	2025	EU listed
Hapag-Lloyd	16,295	2,220,162	2025	EU listed
Samskip	1,450	11,445	2026	Not Listed
Boluda	3,423	12,950	2026	Not Listed
CMA CGM	107,414	3,821,274	2026	Not Listed
Tarros	650	8,137	2026	Not Listed

As shown in Table 11, there are significant differences in employee numbers among companies, so they are grouped directly by order of magnitude. Similarly, in terms of company scale, there are considerable disparities, so an initial grouping by order of magnitude was also performed. Within the category of large-scale companies, further subdivision was implemented. Since the size range for these companies spans from 2,200,000 to 6,100,000, they were divided into two subgroups: those with 2-4 million TEU and those with over 4 million TEU. Details could be found in the table below (Table 12).

Table 12 Categorized Selected Companies
Source: Author

Company	Number of Group Employees	Company Scale (TEU)	Expected Reporting Time	Listing Status
MSC	90,000<n	4,000,000<TEU	2026	Not Listed
Maersk	90,000<n	4,000,000<TEU	2025	EU listed
Hapag-Lloyd	10,000<n<90,000	2,000,000<TEU<4,000,000	2025	EU listed
Samskip	n<10,000	TEU<50,000	2026	Not Listed
Boluda	n<10,000	TEU<50,000	2026	Not Listed

CMA CGM	90,000<n	2,000,000<TEU< 4,000,000	2026	Not Listed
Tarros	n<10,000	TEU<50,000	2026	Not Listed

It's worth noting that an alignment was observed between companies' "expected reporting time" and their "listing status". Upon further analysis, this is because a company's listing status is itself a crucial criterion for determining the reporting timeline. Additionally, since all the selected companies have over 500 employees, the listing status directly determines whether they will report in 2025 or 2026. Thus, there is no need to explore reporting time as a separate possible reason, as the results would be repetitive. Consequently, only three effective variables remain. The report time is still kept, but solely as supplementary information.

Chapter 4 Results and Analysis

This chapter presents the key findings of the research and provides answers and solutions to most of the research questions. First, the differences in compliance levels between companies and their possible causes are analyzed. Thereafter, the focus is on the insufficient disclosures among different chapters, attempting to analyze the reasons behind these deficiencies. Suggestions for improvement are also proposed.

4.1 Compliance Level Discrepancies between Different Companies

4.11 Analysis

The analysis reveals significant discrepancies between different companies, the figure below (Figure 6) demonstrates a comprehensive overview of the compliance levels of each selected company based on ESRS and scoring system.

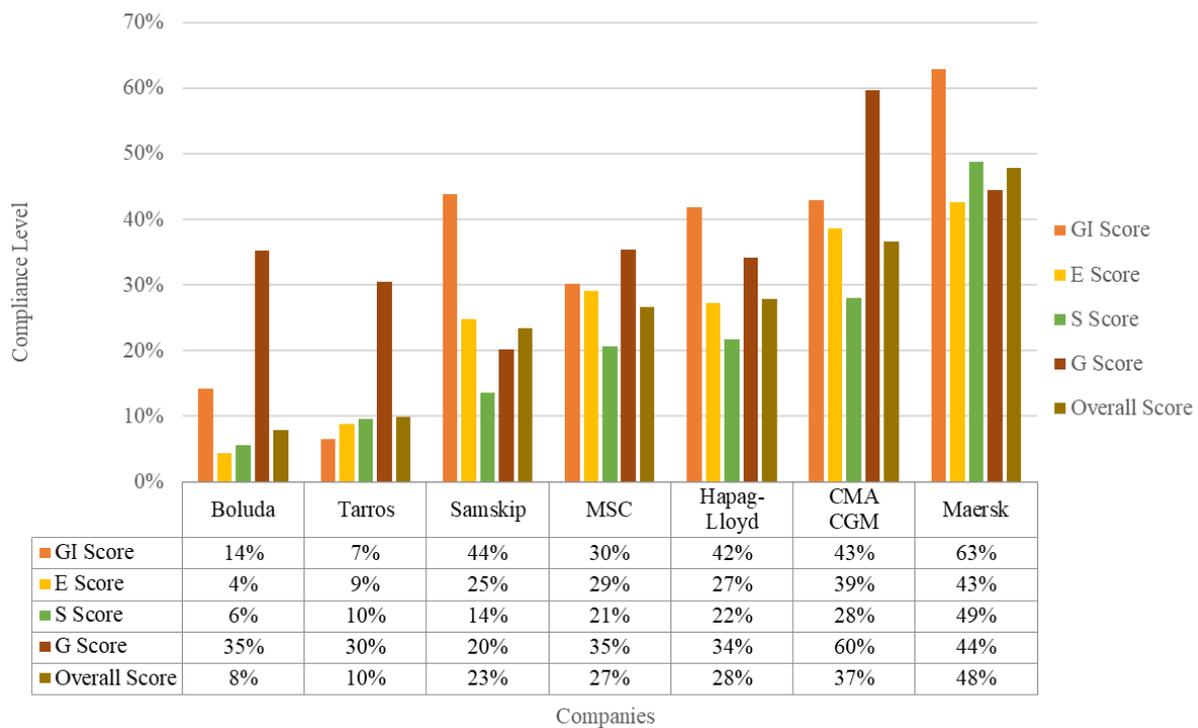


Figure 6 Compliance levels of selected Companies

Source: Author

From Figure 6, It's clear that the overall scores of the companies selected are not ideal, with all below 50% compliance. Among them, Maersk has the highest overall compliance level at about 48%, while Boluda has the lowest overall score at 8%. In addition, CMA CGM's compliance

level is also relatively high, with an overall compliance level of 37%. However, when looking at the overall picture, their compliance levels show a clear progression.

Additionally, through observation, it was found that the company's compliance levels in the four aspects - GI, E, S, and G - all show clear step-like pattern. Due to the different trends in E, S compared to G and GI, the E and S aspects are first analyzed. As shown in Figure 7, regarding environmental performance:

- The lowest level includes Boluda and Tarros.
- The middle level includes Samskip, Hapag-Lloyd, and MSC.
- The highest level consists of CMA CGM and Maersk.

Similarly, for social performance:

- The lowest level includes Boluda, Tarros, and Samskip.
- The middle level encompasses Hapag-Lloyd, MSC, and CMA CGM.
- Maersk alone occupies the highest level.

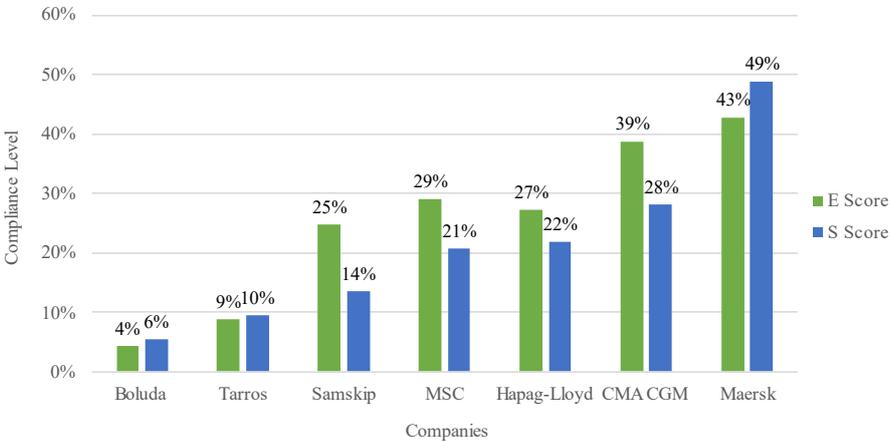


Figure 7 E & S Score Trends across Companies
 Source: Author

A similar tiered progression can be seen in the G and GI aspect, as shown in Figure 8. For Governance aspect, Samskip is at the lowest level, Tarros, Hapag-Lloyd, Boluda, MSC are in the second, Maersk is in the third level, and CMA is in the fourth level. While for GI, Tarros

and Boluda are at the lowest level, MSC, Hapag-Lloyd, CMA CGM and samskip are in the second level. Maersk is at the third level.

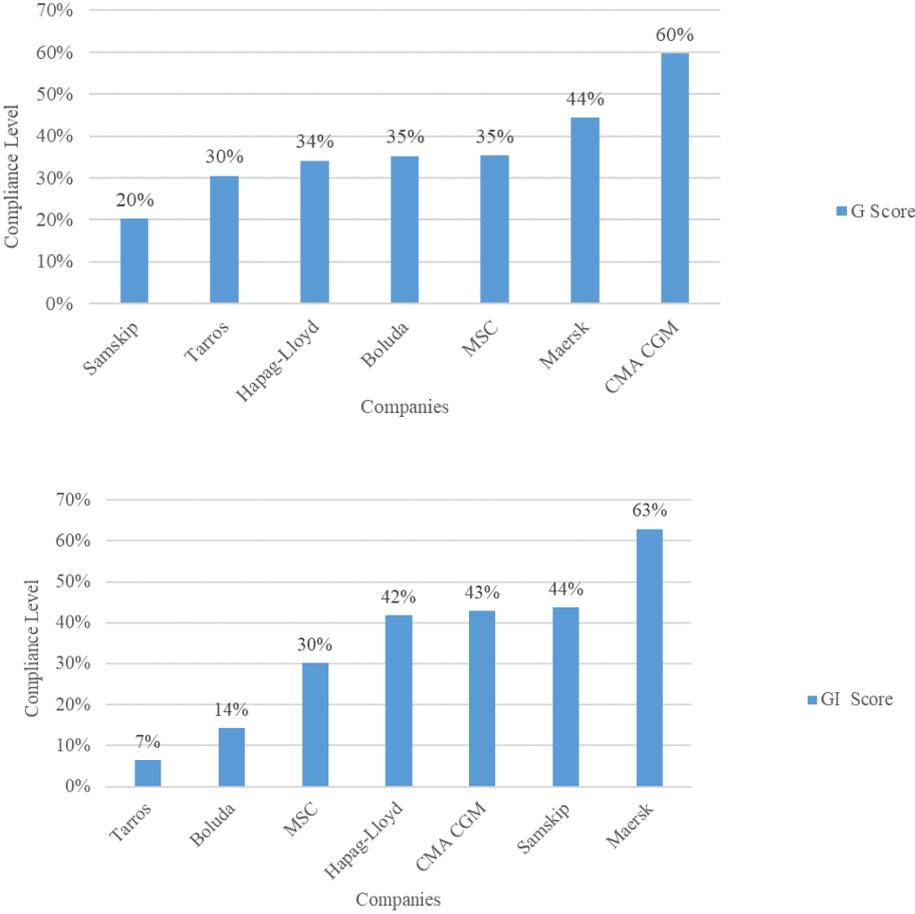


Figure 8 G & GI Score Trends across Companies
 Source: Author

Considering that the distribution of the selected container companies within the top 100 rankings exhibits a distinctive step-like pattern, and this unique distribution, coupled with the significant gaps in scale of the category indicators observed before, suggests that compliance levels may be potentially associated with certain company characteristics

4.12 Possible Reasons Exploration

Listing status

Listing status may be an important influencing factor, so it is first used as a category indicator to examine the compliance situation of different companies. As seen in the figure below (Figure

9), listed companies score higher than non-listed companies on every indicator, suggesting that listed companies generally tend to demonstrate better compliance.

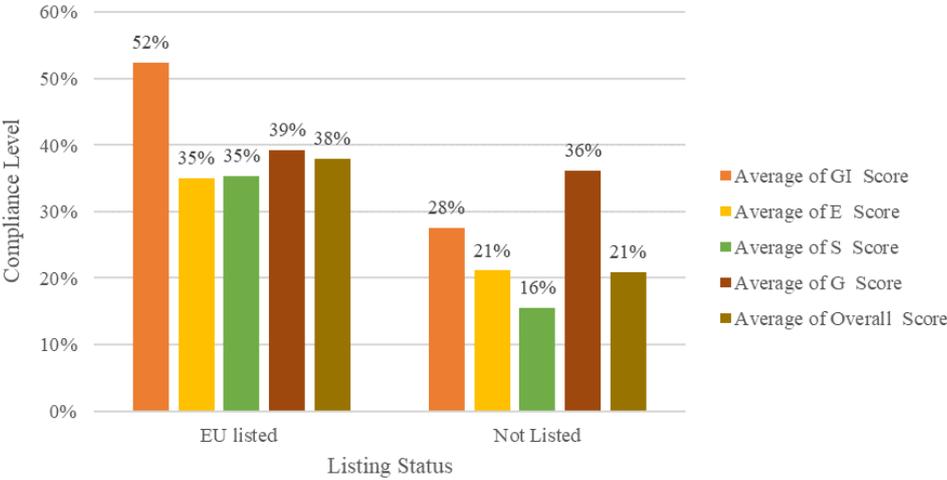


Figure 9 Compliance Levels by Listing Status
Source: Author

In addition, to further refine the analysis, the study classified companies by company scale and number of employees to control for the impact of these variables (Figure 10 & Figure A 3). Within each category, the ESRS compliance levels of listed and non-listed companies were compared, allowing for a more accurate assessment of the relationship between listing status and compliance levels.

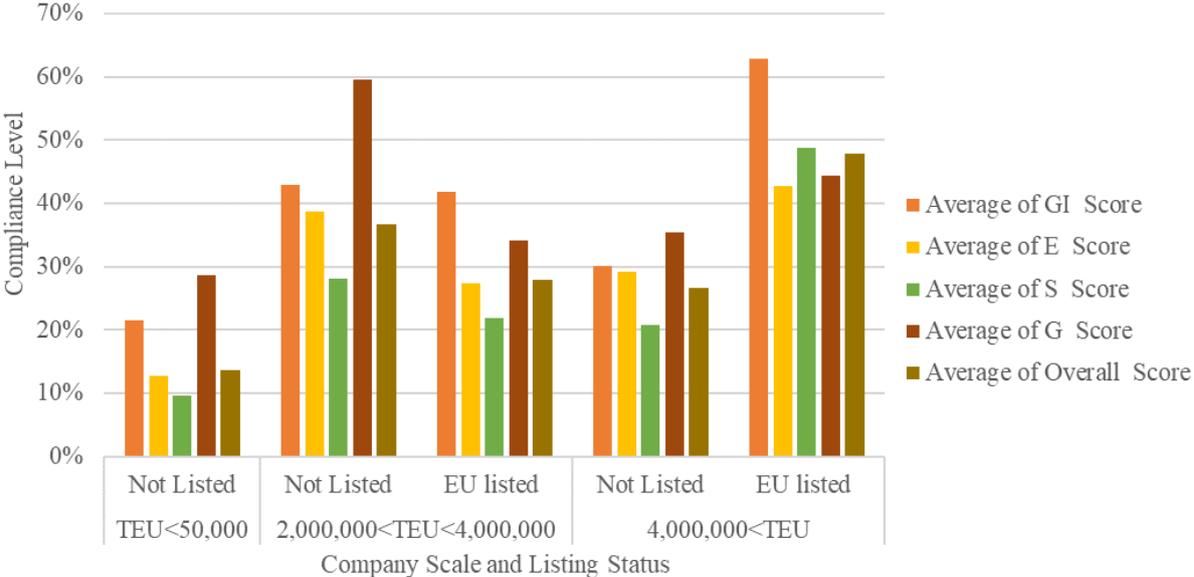


Figure 10 Compliance Levels by Company Scale and Listing Status

Source: Author

In Figure 10, it was found that in the range of TEU greater than 2,000,000 and less than 4,000,000, unlisted companies actually perform better than listed companies. After further analyzing this segment separately in Figure A 2, it was discovered that although these companies are not listed, they have over 90,000 employees, while the listed companies have far fewer than 90,000 employees. This phenomenon may be because large companies with more employees have more human and time resources to improve and enhance ESRS compliance.

Apart from this difference, the observed results are consistent with the trends obtained in Figure 9 - within categories, listed companies generally perform better than non-listed companies. Possible reasons for this trend may include that listed companies are generally larger than unlisted ones, potentially giving them more knowledge and financial resources to focus on and improve ESRS compliance levels.

Furthermore, as listed companies, they are more likely to be subject to oversight from relevant stakeholders, such as regulatory bodies or public media, which may increase their disclosure pressure, leading to more comprehensive reporting. Additionally, listed companies are required to disclose financial reports and information mandated by NFDR, which often results in more mature data collection processes. This maturity in data handling could contribute to better disclosure of information required by ESRS, especially considering the guidelines' high standards for data granularity and breadth.

Moreover, the higher compliance levels observed in listed companies may also be related to the ESRS application date timeline. Specifically, according to the CSRD requirements, large undertakings listed in the EU with more than 500 employees are mandated to comply with ESRS from 2024, necessitating compliant disclosures by 2025. This timeline is earlier than the 2026 or later deadlines for non-listed companies. The more imminent compliance deadline for listed companies likely creates a greater sense of urgency, potentially resulting in stronger motivation to enhance their compliance.

Company Scale

Similarly, company scale was used as a category indicator to observe the compliance situation of different groups (Figure 11), and it was found that larger companies tend to have higher compliance levels. However, the scores in the Governance aspect do not show the same trend of change as the company scale changes. To further understand the connection between company scale and compliance levels, listing status and employee numbers were also controlled to observe the compliance of different company scales within classification categories.

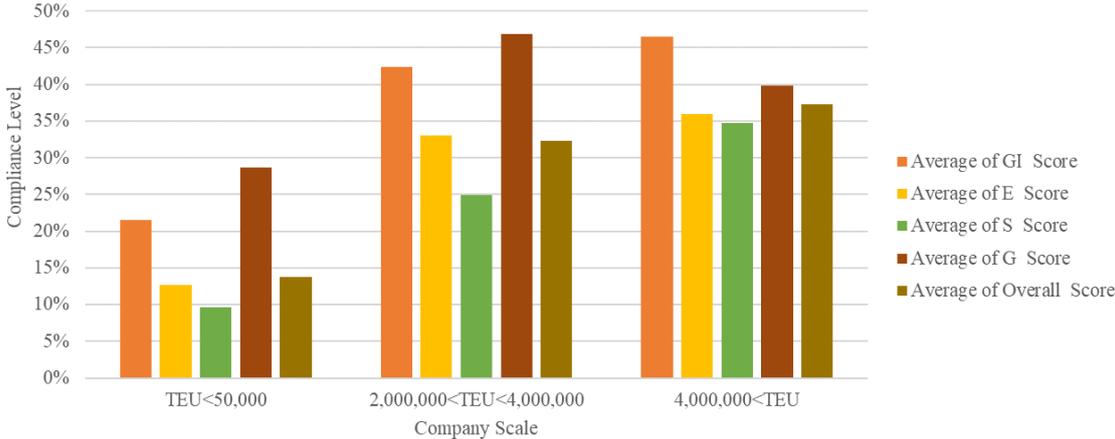


Figure 11 Compliance Levels by Company Scale
 Source: Author

In the Figure 12 and Figure 13, it was found that interestingly, although there seemed to be a certain trend when initially looking at the data, when employee numbers or listing were further controlled as constant variables, the consistency between company size and ESRS compliance levels no longer existed. In the Figure 12, it can be seen that when the number of employees exceeds 90,000, large companies (TEU > 4,000,000) do not show a clear advantage in compliance scores compared to relatively smaller companies (2,000,000 < TEU < 4,000,000). On the contrary, it is observed that they are overtaken by smaller companies in E and G aspects.

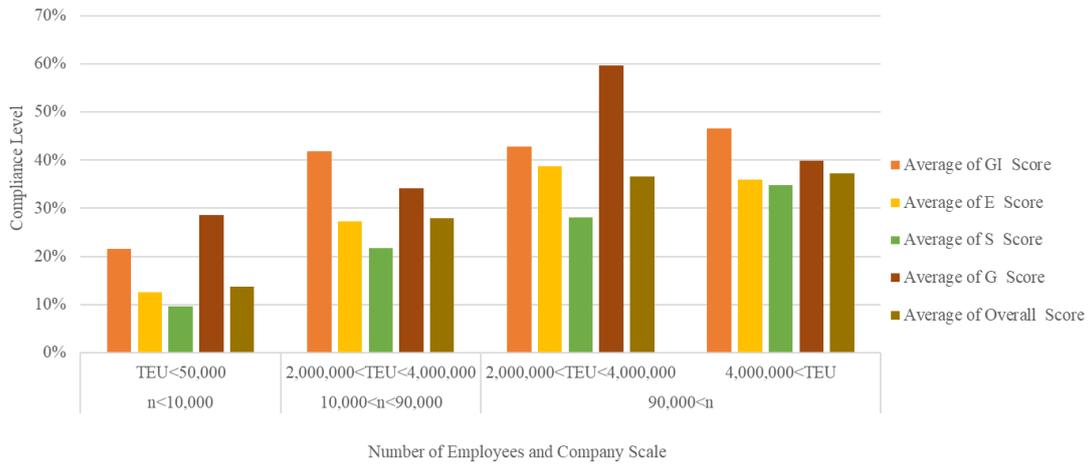


Figure 12 Compliance Levels by Number of Employees and Company Scale

Source: Author

In the Figure 13, this lack of correlation is also reflected in the large non-listed companies (TEU > 4,000,000) and relatively average-sized companies (2,000,000 < TEU < 4,000,000). Non-listed companies of average size outperform large companies in ESRS compliance across the board.

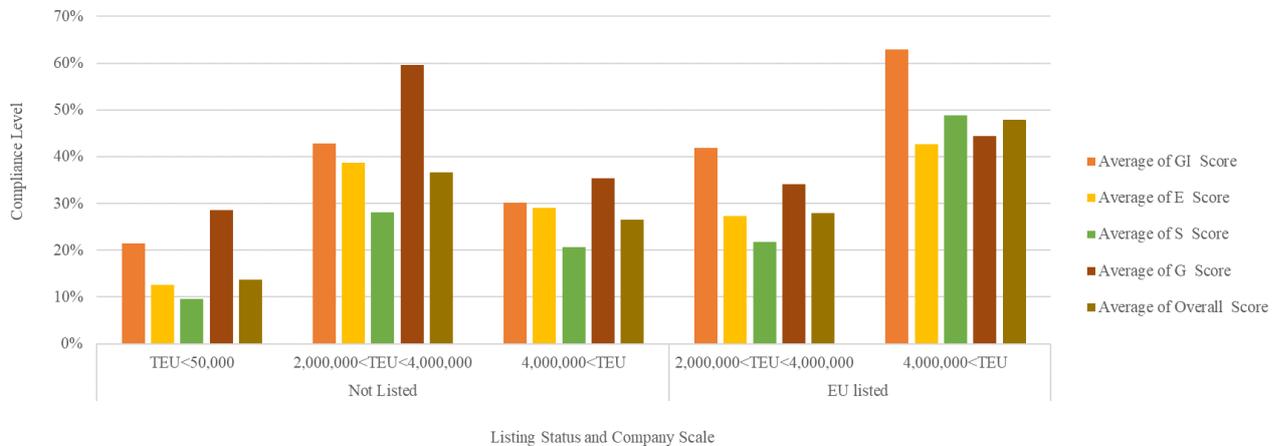


Figure 13 Compliance Levels by Listing Status and Company Scale

Source: Author

Based on these observations, it is difficult to determine a clear or consistent relationship between company scale and ESRS compliance levels. Although larger companies do perform better in some cases, this pattern is not universal or consistent. Therefore, company scale cannot be described as a factor influencing ESRS compliance levels here.

Number of Employees

The same measures were applied to the indicator "number of employees" and it was observed that companies with more employees tend to have a higher ESRS compliance level (Figure 14).

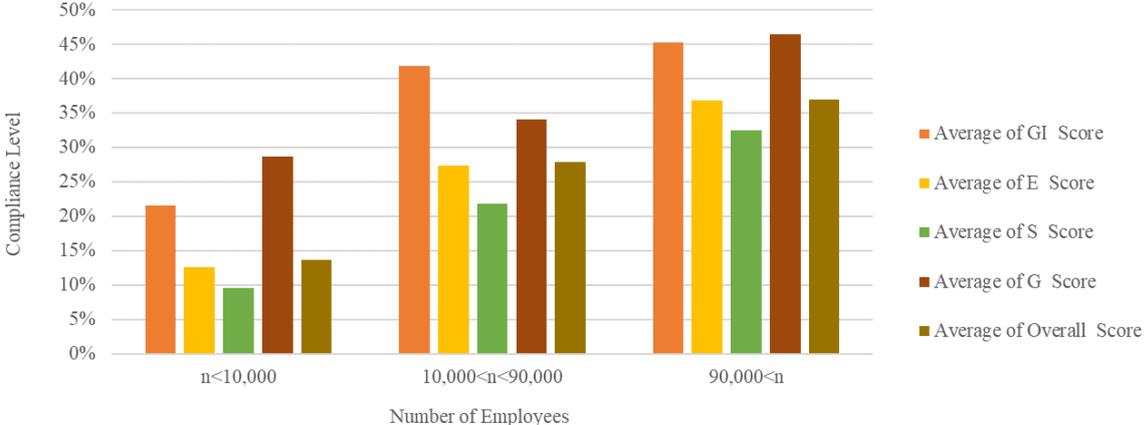


Figure 14 Compliance Levels by Number of Employees
 Source: Author

Furthermore, company scale and listing status variables were controlled to repeat the research (see figure Figure A 4 and Figure A 5) and found a similar trend shown in Figure 14. Within the categories, companies with higher number of employees shows a higher compliance level.

This result is aligned with the exception found when exploring the variable “listing status”. It's possible that companies with more employees might have access to a larger pool of knowledge, experience, and expertise, which could potentially contribute to a higher ESRS compliance score.

4.2 Compliance Deficiencies across Different Disclosure Topics

4.21 Analysis on General Level

To provide a comprehensive overview, a holistic picture of the ESRS compliance scores across all aspects is presented in Figure 15. It's obvious that the Governance aspect gained the highest score at around 37%, while the Social aspect is the lowest one, with a figure of 21%. In addition to Governance and Social aspects, the GI aspect also shows a relatively high score, achieving 35%, which is only marginally lower than Governance. Despite these variations, it's important to note that the overall compliance levels across all aspects fall considerably short of ESRS requirements.

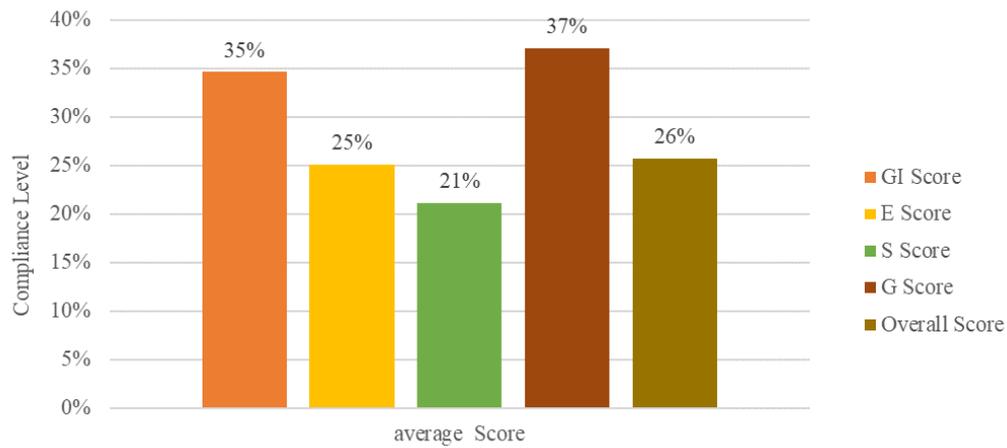


Figure 15 Average ESRS Compliance Levels across Different Aspects

Source: Author

This general picture also reveals some underlying implications. Specifically:

First, the high score in the Governance aspect can be explained by examining the ESRS structure. In the Governance aspect, ESRS has only one chapter for Governance, covering merely 7 disclosure topics. This means G disclosure requirements are not as extensive or detailed as those for E and S. Nevertheless, despite fewer requirements in G, companies did not pay less attention to governance than other aspects. Review of sustainability reports shows most companies disclose as much about governance as they do on E or S, with some even focusing more on governance. This mismatch between disclosure practices and standard requirements leads to higher G scores.

The Social aspect score is much lower than others because container shipping companies lack sufficient attention in this area. Social requirements are mostly related to external factors like workers in the value chain or affected communities. This differs from other aspects where companies can typically meet ESRS requirements by examining their internal activities or contributions. However, for the social aspect, companies find it challenging to satisfy these requirements through such commonly used internal assessment methods. These reasons will be explained further in the following content.

In the GI area, ESRS 2 requires companies to disclose information that is more general in nature.

This results in less detailed information requirements for GI compared to E, S and G aspects, making it relatively easier to meet. Additionally, the high score in GI is related to the adoption of other international sustainability reporting standards like GRI. Reports review found that almost all selected companies used the GRI framework in their sustainability reports. This is significant because GRI includes several sections requiring basic information that partially overlaps with ESRS 2 requirements. This overlap helps companies score better in the GI area.

Regarding the Environmental aspect, the score basically aligns with expectations. This assessment is based on two primary factors. Firstly, the environmental domain has seen earlier adoption and more advanced development of knowledge, promotion, and information disclosure requirements. As a result, companies have generally established quite robust environmental protection activities and heightened awareness in this area. However, ESRS requires extensive disclosures in this aspect, specifically 5 chapters with over 350 data points covered. This reaches 45% of the total data points, almost covering half of the total DRs in the whole ESRS. Consequently, the environmental aspect poses significantly high reporting standards. This interplay between companies' established practices and these rigorous requirements results in a balanced, mid-range score for the Environmental aspect.

4.22 Analysis of Chapters and Disclosure topics

This section dives deep into each chapter of ESRS, trying to find the most insufficient disclosure topics and the possible reasons for the deficiencies.

On the structure, the order of GI, E, S, G and their respective disclosure topics is followed. Finally, the compliance status of selected DRs in ESRS 1 is analyzed and suggestions for better compliance with the whole ESRS are proposed.

GI Aspect

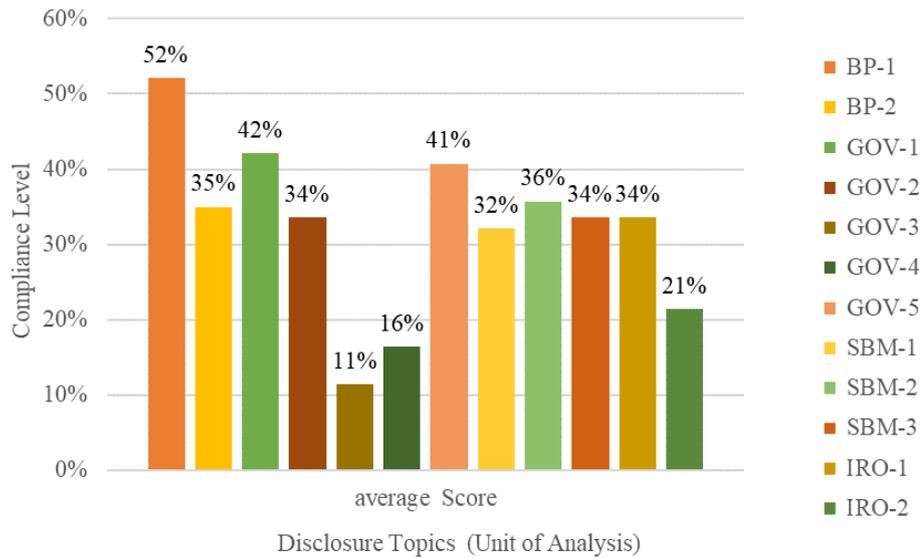


Figure 16 Average Compliance Levels of Disclosure Topics in GI Aspect
Source: Author

The examination begins with the status of GI disclosure topics. To enhance comprehension, all disclosure topics referred here and in the subsequent sections are further explained in the Table A 3. From Figure 16, it's clear that GOV-3, GOV-4 and IRO-2 are the lowest ones with scores at 11%, 16% and 21% respectively. These three topics will be unfolded in detail as follows:

GOV-3 requires companies to disclose whether and how they integrate sustainability-related performance into incentive plans for management level. GOV-4 is about creating a mapping between the information in the sustainability reports and the due diligence process of the company, mainly aiming to illustrate which information in the report is related to or from the due diligence. IRO-2 requires companies to create a list detailing which DRs of ESRS are met with clear reference to the corresponding content. Additionally, companies need to illustrate clearly how they determine whether a topic or information is material or not, including the criteria they use (European Commission, 2023).

From these descriptions, it can be observed that these DRs dig into details that companies may ignore if they didn't check these requirements closely. Additionally, the DRs tend to be specifically related to ESRS itself. For instance, they include the mapping between due diligence processes and ESRS information, cross-referencing between ESRS and relevant

disclosures, and the materiality assessment process. These requirements cannot be satisfied by simply listing and illustrating plans, goals, or actions. Instead, they require companies to deeply follow the instructions provided in ESRS.

Overall, these observations lead to the conclusion that companies have not given sufficient attention to ESRS in the GI aspect and its unique characteristics in their 2023 sustainability reports. This lack of focus is the underlying reason for the unsatisfactory GI score.

Environmental Aspect

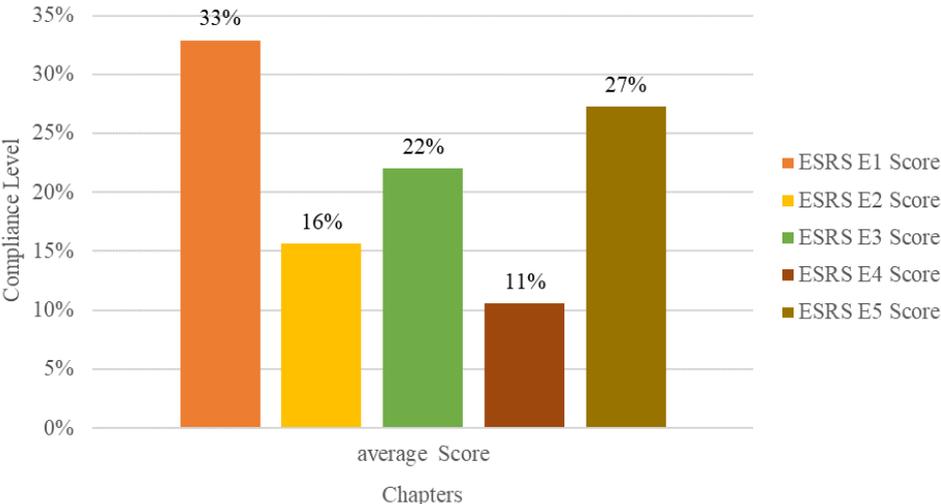


Figure 17 Average Compliance Levels of environmental Chapters
Source: Author

Figure 17 shows the scores of each chapter in the E aspect. It's evident that E2 and E4 are the lowest ones. According to Table 3, E2 is about pollutions while E4 is about biodiversity and ecosystems (European Commission, 2023). E1 and E5 are the highest ones, covering climate change and circular economy respectively (European Commission, 2023). This can be attributed to the fact that these topics receive significant attention from public media, are frequently addressed in other sustainability reporting frameworks, and are closely linked to container shipping operations. However, the E aspects encompass much more than these well-publicized areas, also requiring disclosure on aspects that companies are likely to overlook in both their daily operations and reporting practices, for instance, detailed pollution disclosures

and information related to ecological species.

To further investigate the disclosure topics in E2 and E4, the data was analyzed and the results are presented in Figure 18.

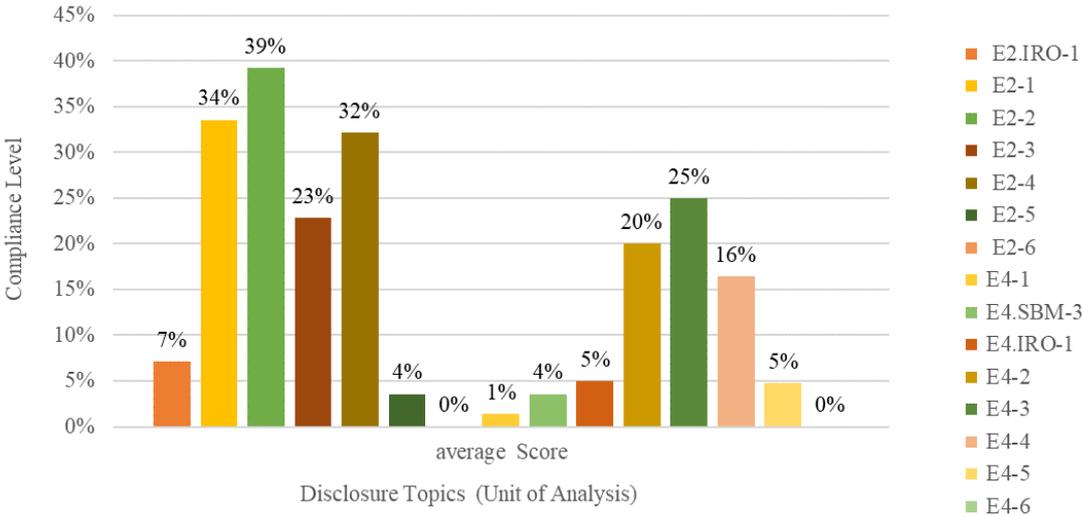


Figure 18 Average Compliance Levels of Disclosure Topics in E Aspect
Source: Author

From Figure 18, it’s clear that multiple topics are with quite low scores. For clarity, the topics with their content are organized into the table below (Table 13).

Table 13 Disclosure Topics in E2 and E4 with low scores
Source: (European Commission, 2023)

Disclosure Topics	Compliance Level	Content
E2.IRO-1	7%	Company shall describe the processes of recognizing and assessing material pollution-related IRO
E2-5	4%	Companies must report information on the lifecycle of substances of concern and those classified as very high concern. This includes detailing their production, use, distribution, marketing, and cross-border movement, whether these substances are handled independently or as part of mixtures or products.
E2-6	0%	Projected financial effects of material pollution-related risks and potential opportunities

Disclosure Topics	Compliance Level	Content
E4-1	1%	Companies should explain how its effects on biodiversity and ecosystems, as well as its reliance on them, influence and shape its strategic decisions and business approach. This disclosure should also cover the associated risks and opportunities that arise from these interactions.
E4.SBM-3	4%	Material IRO and their interaction with strategy and business model
E4.IRO-1	5%	Company shall describe the processes of recognising and assessing material biodiversity and ecosystem-related IRO
E4-5	5%	Companies should include specific metrics that reflect its significant impacts on biodiversity and ecosystem health.
E4-6	0%	Expected financial outcomes linked to biodiversity and ecosystem risks and opportunities

From the table, it's clear that several topics with low scores are actually related to the same content. For example, E2 IRO-1 and E4 IRO-1 are both related to describing the process of how companies identify and assess the IROs under the corresponding topics. Also, E2-6 and E4-6 both require companies to illustrate possible financial impacts related to the identified risks and opportunities.

Apart from the similarity, these topics that companies fail to score high on are all either at the strategy level or content that companies tend to ignore. For example, E4-1 requires information on interaction between IRO and business strategy planning, while E2-5 is about the lifecycle of substances of concern.

These issues reflect three underlying reasons. Firstly, companies fail to pay attention to the E aspect of ESRS in their 2023 report, as they fail to obey the topics of similar content repeatedly. Secondly, companies fail to integrate sustainability into the strategy and financial level, which indicates the possibility of "greenwashing". Lastly, the materiality assessment is not properly followed, as all these low-scoring topics are based on a double materiality assessment. This also highlights a key characteristic of ESRS: its disclosure requirements are based on the double materiality principle. Thus, if companies fail to address this principle adequately, they cannot

fully meet all disclosure requirements based on it. This is the most significant issue exposed in the environmental aspect of reporting.

Social Aspect

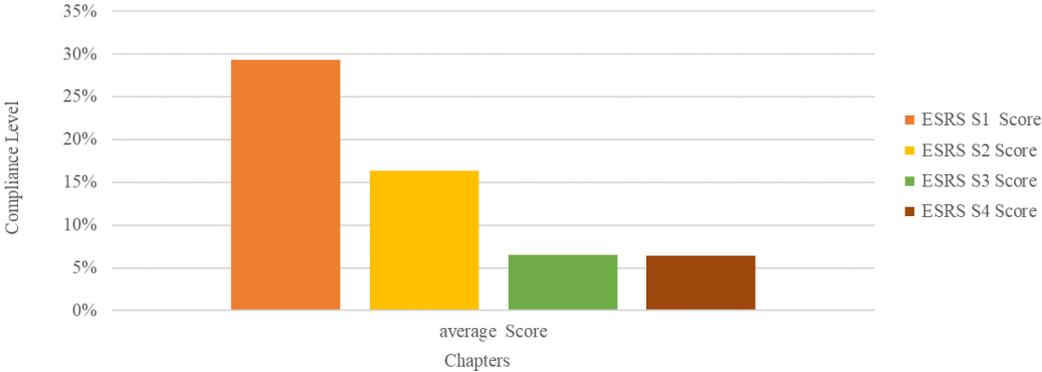


Figure 19 Average Compliance Levels of Social Chapters
Source: Author

From Figure 19, it can be observed that the highest-scoring chapter is S1 (companies' own workforce), yet it still falls below 30% compliance. S2 (workers in the value chain) follows with around 15% compliance. The remaining two chapters, S3 (affected communities) and S4 (consumers), score even lower at approximately 10% compliance each.

The analysis revealed the reasons behind, study found that companies tend to disclose more about their internal operations and activities, such as green technology innovation helping reduce GHG emissions or establishing a whistleblower channel for inner employees. This is reasonable, but not sufficient. In the ESRS social aspect, it requires more information that goes beyond the company itself, which, makes it harder for companies to meet the DRs.

For example, S2 needs companies to focus on the workers in the value chain instead of those within their own workforce. However, from the report review, it's found that companies barely mentioned this, but mostly concentrate on workers within the company scope. Additionally, S4, consumers and end-users, this is closely related to maritime logistics, which is the upstream and downstream aspects of the supply chain. Logically speaking, container shipping companies should have the ability to collect relevant data and score relatively well in this aspect. However,

still, it's not much mentioned either.

These findings suggest that companies are more comfortable disclosing information about their direct operations but struggle to provide comprehensive information about their broader social impacts and responsibilities. At the same time, there's also a possibility that companies simply aren't doing much in social aspects beyond their immediate scope of operations.

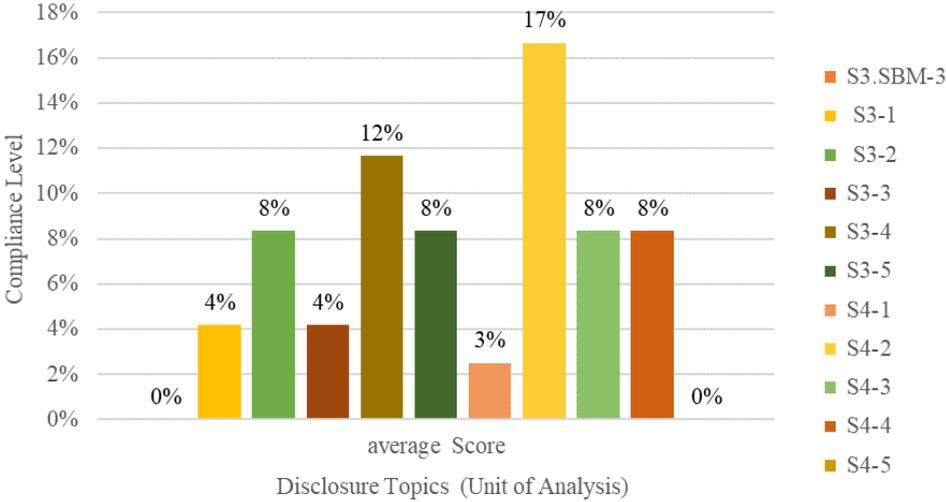


Figure 20 Average Compliance Levels of Disclosure Topics in S Aspect
Source: Author

To further unfold the disclosures, this paper selects the data from S3 and S4 to demonstrate and investigate. Figure 20 shows that there are 5 topics with extremely low points. They are S3.SBM-3, S3-1, S3-3, S4-1, and S4-5. For better understanding, they are illustrated as follows:

- S3.SBM-3: Companies shall illustrate the identified material IRO and corresponding interaction with strategy and business model (European Commission, 2023).
- S3-1: It requires companies to disclose policies set related to the influenced communities (European Commission, 2023).
- S3-3: Companies shall disclose what processes they have taken to reduce negative impacts they bring to communities and what are the channels for them to bring up concerns (European Commission, 2023).
- S4-1: Companies shall provide policies they have in place related to the consumers and

end-users (European Commission, 2023).

- S4-5: What are the targets of companies to manage IRO (European Commission, 2023).

Based on the content of topics, it is noticed that strategy disclosures are still insufficient. Apart from that, these topics involve policies, actual actions, and targets. From experience of reviewing ESRS and reports, the DRs related to policies, actions, and targets are the easiest ones for which to meet the requirements. This is because companies typically provide information about their existing policies, targets and actions taken in relevant areas. Though the information is not structured or well organized, they would typically manage to mention at least some relevant details in these areas. If the companies fail to meet DRs in these aspects, it probably indicates that the company did not do anything in the area, which also well explains why the whole scores in S3 and S4 are low.

Governance Aspect

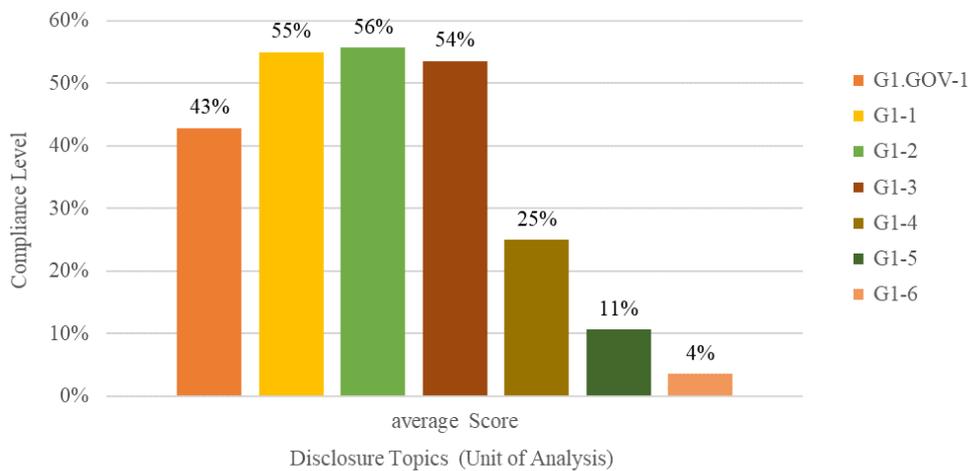


Figure 21 Average Compliance Levels of Disclosure Topics in G Aspect

Source: Author

Since the governance aspect only contains one chapter, the paper directly illustrates the disclosure topics. From Figure 21, it's clear that overall, the performance is good, especially compared to other aspects. However, G1-5 and G1-6 are the lower ones.

G1-5 and G1-6 are unique topics related to the governance aspect. G1-5 is about the political impact and lobbying activities of the company. G1-6 requires companies to provide information

about their payment practices, especially late payments (European Commission, 2023).

From the report review, these two topics are relatively detailed disclosures and are located at the end of the entire ESRS, so they might be omitted by companies because they may not be aware of them. This also indicates that companies still fail to address the requirements of ESRS and are not well-prepared to meet ESRS's extensive disclosure requirements.

Lastly, the analysis returns to ESRS 1. In this paper, 3 aspects in ESRS 1 were checked: the placement of the reports, the structure of the reports, and the inclusion of taxonomy regulations DRs.

Table 14 Compliance Level of ESRS 1
Source: Author

Row Labels	Placement	Structure	Taxonomy Inclusion
Tarros	0%	75%	0%
Samskip	0%	100%	100%
MSC	0%	0%	0%
Maersk	100%	100%	100%
Hapag-Lloyd	100%	0%	100%
CMA CGM	0%	50%	0%
Boluda	0%	50%	0%
Average	29%	54%	43%

From Table 14, it's clear that the compliance level is also not ideal, with average scores all below 60%. The only company that fully obeyed the 3 requirements is Maersk. Among the 3 requirements, placement has the lowest score because many companies do not publish their management report before, thus separately listing their sustainability report instead of consolidating it into management report. The structure scores highest since most companies compile reports using the order of ESG.

4.23 Suggestions

From the assessment and analysis, it's evident that companies are not paying attention to the preparation of ESRS and are not fully prepared. This is quite dangerous as some of these companies need to publish fully compliant reports from 2025. Based on this situation, it is

suggested that companies take action now instead of postponing the entire preparation until the end because some processes require not only financial resources but also a large amount of time and human resources. For instance, in the social aspect, S3 and S4 are barely addressed, suggesting minimal corporate activities in these areas. However, it is important to realize that S3 and S4 collectively encompass approximately 90 data points. The process of fully understanding and preparing compliant information for such a large number of data points can be significantly time-consuming and resource-intensive.

Secondly, for companies with an established foundation in sustainability practices, it is advised that they fully follow the requirements of double materiality principles and the assessment process. These are the basis for the whole ESRS. They should also pay attention to the details of requirements. Some of the disclosed information is indeed relevant; however, it fails to match the details in ESRS, causing low scores.

Also, companies should try to integrate sustainability-related IRO into the strategy level. ESRS has many high-level DRs that require companies to provide well-thought-out information on the mutual influence between IRO and strategy and business model. This aspect places high demands on companies. Equally important is the financial impact, which many companies have not considered. This is a major aspect because almost every section repeatedly mentions requirements for quantifying financial impact.

Lastly, companies should comply with ESRS 1's format and structure requirements. The report should be both machine-readable and human-readable, so it's important to be more logical and clearer. This is also the simplest and most straightforward aspect that can be improved.

If companies indeed lack time or expertise to ensure full compliance with ESRS reporting, it would be essential to turn to accounting or consulting firms for help.

Chapter 5 Conclusion

This study set out to investigate the compliance of container shipping companies' sustainability reports with the upcoming ESRS requirements. Specifically, research focused on exploring the scope and timeline of ESRS implementation, differences in compliance levels among different companies, areas of inadequate disclosure, and potential strategies for improvement.

5.1 Key Findings

The research reveals that ESRS is a comprehensive disclosure framework requiring significant resources and investment. The scope of ESRS extends beyond EU-established entities, encompassing non-EU companies with significant operations within the European Union. The implementation of these standards is set to come into force in 2024, with large listed companies being the primary focus in the initial phase. Non-EU companies may need to report in 2029.

Additionally, study found that compliance levels across different container shipping companies vary greatly, but generally, the compliance level is far below ESRS requirements. This paper further explored possible reasons using category analysis and found that listing status and number of employees have a positive correlation with compliance levels within the study sample, while company scale does not show a clear influence.

The research also delved deep into the compliance level of disclosure topics for each chapter and found that none of the companies fully comply with ESRS. The most insufficient disclosures and possible reasons behind them were investigated. Results have shown that the social aspect is the least disclosed, with the lowest average score of approximately 20%. At the level of individual disclosure topics, E2-6, E4-6, S3.SBM-3, and S4-5 are the most deficient, all scoring 0% and thus falling far short of meeting requirements. Notably, two of these four topics are related to the financial impact of risks and opportunities.

In addition, the analysis reveals that current disclosures predominantly focus on DRs related to policies, actions, and targets. However, this concentration is primarily quantitative rather than qualitative. While companies frequently address these areas, the depth and quality of the information provided often fall short of ESRS expectations. For instance, the action section

typically contains simple descriptions rather than the comprehensive, systematic reflections on processes and impacts that ESRS requires. This disparity highlights a significant gap between the quantity of disclosures and their substantive quality.

Although the study analyzes only seven companies, it's important to note that these were not randomly selected. Rather, they were carefully filtered based on specific research criteria, particularly the requirement to publish sustainability reports. As such, despite the limited sample size, these companies can indeed provide valuable insights into industry practices.

5.2 Suggestions for Better Compliance

In terms of strategies for better compliance, several key factors need to be considered.

First and foremost, double materiality is a crucial concept. Without it, the foundation for effective reporting is missing, making it challenging to fully comply with DRs that are built on this principle. For companies that haven't yet begun preparing their sustainability statements, they should start with a double materiality assessment and develop appropriate determining criteria based on companies' own specific circumstances.

Furthermore, companies should place greater emphasis on strategic-level disclosure requirements, particularly focusing on the mutual influence between IRO assessments and their strategic business models. Special attention should be also given to related financial impacts, as companies often struggle with quantifying these effects accurately. This area typically requires additional effort and precision in reporting.

Additionally, companies must pay careful attention to details. To ensure compliance, companies should carefully cross-check each item to avoid overlooking important details.

Lastly, companies should work on building their knowledge pool. This can be done by seeking or hiring talented people in this field. If the expertise within the company is not sufficient, it's also recommended to consider turning to external agencies, such as accounting firms, for assistance.

5.3 Research Limitations

This study evaluates sustainability reports from the perspective of external users, which introduces certain limitations to the analysis. Primarily, this paper can only identify areas where companies lack reporting or have insufficient disclosures. Due to the inability to access internal information, it's not possible to verify the accuracy of the sustainability information provided by the companies.

Methodological limitations also warrant consideration. The scoring criteria developed are somewhat rough, which introduces potential inconsistencies in the evaluation. Furthermore, when applying these criteria, the scoring process may be subject to human bias, potentially leading to inaccuracies in the results. These factors could impact the precision and reliability of comparative analysis.

Lastly, the research is constrained by data collection limitations. The final sample consists of only 7 companies, which is relatively small and may not fully represent the entire container shipping market. This limited sample affects the generalizability of findings. Moreover, when exploring reasons for disclosure differences between companies, the paper considered only three aspects, which may not capture all influential factors affecting sustainability reporting practices in the industry. These constraints in sample size and scope of analysis may limit the comprehensiveness of the conclusions in the container shipping sector.

5.4 Suggestions for future research

Building upon current study, several suggestions for future research emerge that could enhance understanding of ESRS compliance in the container shipping industry and beyond.

Firstly, as sector-specific ESRS guidance for the transport industry is expected to be released in Q4 2024 according to EFRAG, future research can incorporate these standards. This addition would complement this study, making the content more comprehensive and completing the criteria framework. Such research would provide valuable insights into how industry-specific guidelines impact sustainability reporting practices.

Secondly, this study focused on ESRS guidelines for EU companies. However, ESRS is expected to release specific guidelines for non-EU companies. Future research could explore the comparison between these two sets of ESRS guidelines, examining how they differ and why. Researchers could also investigate the compliance levels of non-EU companies with these specialized guidelines and analyze the reasons behind varying degrees of adherence.

Furthermore, a more granular analysis at the data point level of ESRS requirements could provide deeper insights into compliance challenges and opportunities. This detailed examination would help identify specific areas where companies struggle to meet ESRS standards and could inform targeted strategies for improving compliance.

Lastly, given that most companies have not yet published their sustainability reports, it would be valuable to investigate a larger number of companies in the future. This would provide a more representative and comprehensive view.

These proposed research directions would contribute to a more robust understanding of ESRS compliance, not only in the container shipping industry but also across other sectors. By addressing these areas, future studies can provide valuable guidance for companies striving to enhance their sustainability reporting practices and for policymakers working to refine and implement effective reporting standards.

APPENDIX A: External Source Information

Table A 1 Detailed Categories of Disclosure Requirement

Source: (European Commission, 2023, pp. 35-37)

Disclosure Requirements	Basis for preparation	Disclosure Requirement BP-1 – General basis for preparation of sustainability statements
		Disclosure Requirement BP-2 – Disclosures in relation to specific circumstances
		Disclosure Requirement GOV-1 – The role of the administrative, management and supervisory bodies
	Governance (GOV)	Disclosure Requirement GOV-2 – Information provided to and sustainability matters addressed by the undertaking’s administrative, management and supervisory bodies
		Disclosure Requirement GOV-3 - Integration of sustainability-related performance in incentive schemes
		Disclosure Requirement GOV-4 - Statement on due diligence
		Disclosure Requirement GOV-5 - Risk management and internal controls over sustainability reporting
		Disclosure Requirement SBM-1 – Strategy, business model and value chain
	Strategy (SBM)	Disclosure Requirement SBM-2 – Interests and views of stakeholders
		Disclosure Requirement SBM-3 - Material impacts, risks and opportunities and their interaction with strategy and business model
(process) Disclosures on the materiality assessment process		
Impact, risk and opportunity management (IRO)	Disclosure Requirement IRO-1 - Description of the processes to identify and assess material impacts, risks and opportunities	
	Disclosure Requirement IRO-2 – Disclosures requirements in ERSR covered by the undertaking’s sustainability statement	
	(PA) Minimum disclosure requirement on policies and actions	
Metrics and targets (MT)	Minimum disclosure requirement - Policies MDR-P – Policies adopted to manage material sustainability matters	
	Minimum disclosure requirement - Actions MDR-A – Actions and resources in relation to material sustainability matters	
	Minimum disclosure requirement – Metrics MDR-M – Metrics in relation to material sustainability matters	
		Minimum disclosure requirement – Targets MDR-T – Tracking effectiveness of policies and actions through targets

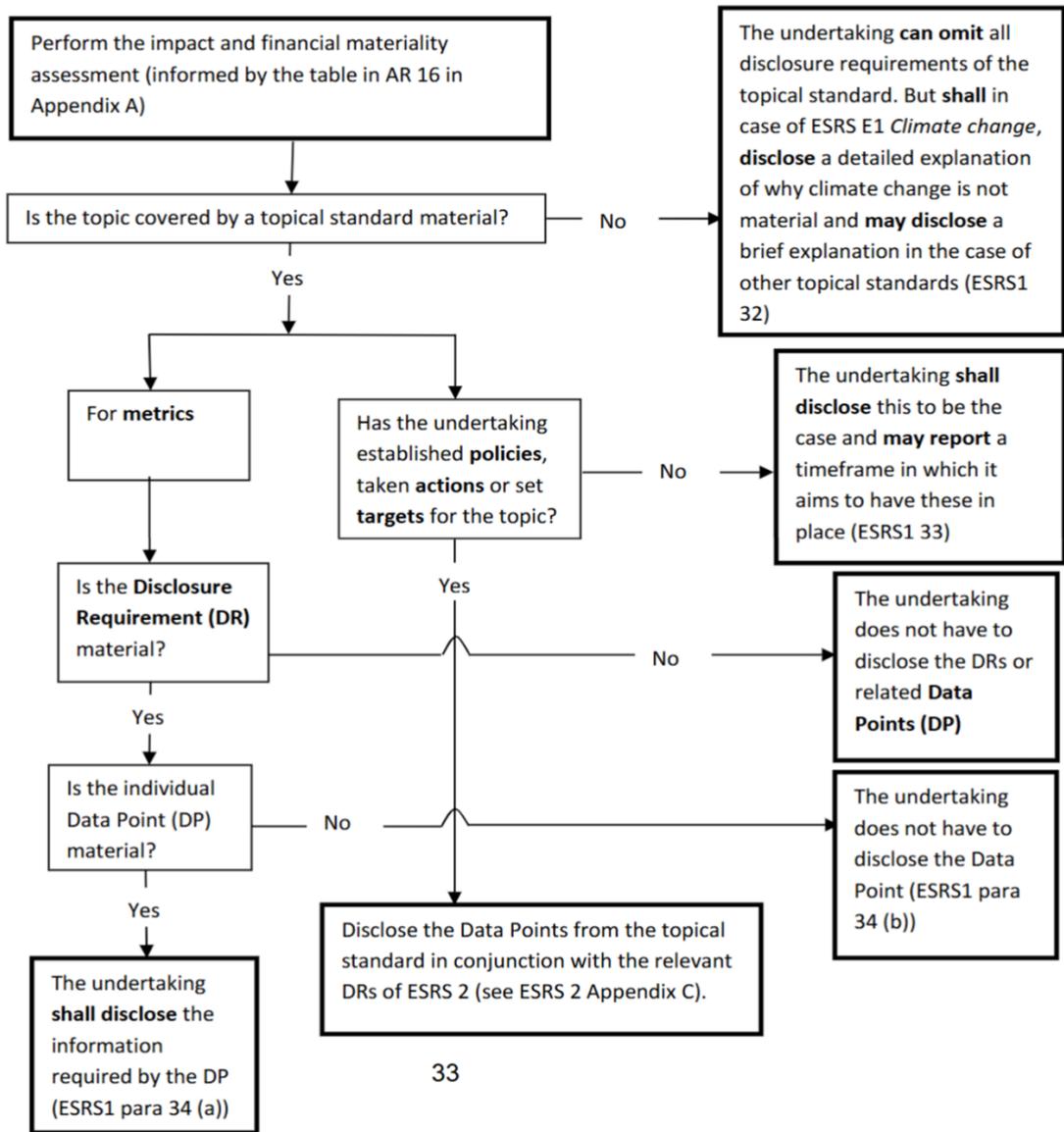


Figure A 1 Materiality Assessment Flowchart
 Source: (European Commission, 2023, p. 33)

Table A 2 Horizontal Layout of the Balance Sheet (extraction)

Source: (European Parliament & Council of the European Union, 2023, pp. 96-97)

Category	Subcategory	Details/Notes
A. Subscribed capital unpaid		(unless national law provides that called-up capital is to be shown under 'Capital and reserves', in which case the part of the capital called but not yet paid shall appear as an asset either under A or under D (II) (5)).
B. Formation expenses		as defined by national law, and in so far as national law permits their being shown as an asset. National law may also provide for formation expenses to be shown as the first item under 'Intangible assets'.
C. Fixed assets	I. Intangible assets	
	1. Costs of development	in so far as national law permits their being shown as assets.
	2. Concessions, patents, licenses, trade marks, and similar rights and assets	(a) acquired for valuable consideration and need not be shown under C(I)(3); or (b) created by the undertaking itself, in so far as national law permits their being shown as assets.
	3. Goodwill	to the extent that it was acquired for valuable consideration.
	4. Payments on account	
	II. Tangible assets	
	1. Land and buildings	
	2. Plant and machinery	
	3. Other fixtures and fittings, tools, and equipment	
	4. Payments on account and tangible assets in the course of construction	
	III. Financial assets	

Category	Subcategory	Details/Notes
	1. Shares in affiliated undertakings	
	2. Loans to affiliated undertakings	
	3. Participating interests	
	4. Loans to undertakings with which the undertaking is linked by virtue of participating interests	
	5. Investments held as fixed assets	
	6. Other loans	
D. Current assets	I. Stocks	
	1. Raw materials and consumables	
	2. Work in progress	
	3. Finished goods and goods for resale	
	4. Payments on account	
	II. Debtors	(Amounts becoming due and payable after more than one year shall be shown separately for each item.)
	1. Trade debtors	
	2. Amounts owed by affiliated undertakings	
	3. Amounts owed by undertakings with which the undertaking is linked by virtue of participating interests	
	4. Other debtors	
	5. Subscribed capital called but not paid	(unless national law provides that called-up capital is to be shown as an asset under A).
	6. Prepayments and accrued income	(unless national law provides that such items are to be shown as assets under E).
	III. Investments	
	1. Shares in affiliated undertakings	

Category	Subcategory	Details/Notes
	2. Own shares	(with an indication of their nominal value or, in the absence of a nominal value, their accounting par value), to the extent that national law permits their being shown in the balance sheet.
	3. Other investments	
	IV. Cash at bank and in hand	
E. Prepayments and accrued income		(unless national law provides that such items are to be shown as assets under D (II) (6)).

Table A 3 Illustration of Disclosure Topics

Source: (European Commission, 2023)

Disclosure Topics	Compliance Level	Content
BP-1	52%	BP-1 includes the preparation basis of the report, focusing mainly on the consolidation scope and the value chain scope.
BP-2	35%	BP-2 addresses disclosures in special conditions, helping users understand how these situations may impact the report.
GOV-1	42%	GOV-1 requires companies to provide information on management bodies, including their composition, roles, and responsibilities.
GOV-2	34%	GOV-2 mainly details how the management body is informed about sustainability-related matters and the corresponding solutions.
GOV-3	11%	Companies need to disclose whether and how they integrate sustainability-related performance into incentive plans for management level.
GOV-4	16%	Companies shall create a mapping between the information in the sustainability reports and the due diligence process of the company, mainly aiming to illustrate which information in the report is related to or from the due diligence.
GOV-5	41%	Companies shall disclose information on sustainability-related risk management and internal control systems.
SBM-1	32%	Companies shall provide information on segments of strategies, business models and value chain that are related to sustainability matters.
SBM-2	36%	Companies shall illustrate how the interests and opinions of stakeholders are considered in their strategy and business model.

Disclosure Topics	Compliance Level	Content
SBM-3	34%	Companies shall introduce the material IROs and explain how they interact with the company's strategy and business model.
IRO-1	34%	Companies shall provide information on the processes used to identify and assess IROs.
IRO-2	21%	Companies shall create a list detailing which DRs of ESRS are met with clear reference to the corresponding content. Additionally, companies need to illustrate clearly how they determine whether a topic or information is material or not, including the criteria they use.
E2.IRO-1	7%	Company shall describe the processes of recognizing and assessing material pollution-related IRO.
E2-1	34%	Companies shall describe their policies for managing material pollution prevention-related IROs.
E2-2	39%	Companies shall outline specific measures taken to address pollution and the resources allocated to these initiatives.
E2-3	23%	Companies shall provide information on adopted pollution-related targets.
E2-4	32%	Companies need to report the types of pollutants released from their operations, as well as any microplastics they produce or use.
E2-5	4%	Companies must report information on the lifecycle of substances of concern and those classified as very high concern. This includes detailing their production, use, distribution, marketing, and cross-border movement, whether these substances are handled independently or as part of mixtures or products.
E2-6	0%	Companies shall disclose projected financial effects of material pollution-related risks and potential opportunities
E4-1	1%	Companies should explain how its effects on biodiversity and ecosystems, as well as its reliance on them, influence and shape its strategic decisions and business approach. This disclosure should also cover the associated risks and opportunities that arise from these interactions.
E4.SBM-3	4%	Material IRO and their interaction with strategy and business model.
E4.IRO-1	5%	Company shall describe the processes of recognizing and assessing material biodiversity and ecosystem-related IRO.
E4-2	20%	Companies should outline their policies for handling significant biodiversity and ecosystem impacts, risks, dependencies, and opportunities.

Disclosure Topics	Compliance Level	Content
E4-3	25%	Companies must provide a detailed account of the actions it has taken regarding biodiversity and ecosystems, as well as the resources dedicated to implementing these initiatives.
E4-4	16%	Companies shall clearly state the goals it has set concerning biodiversity and ecosystems.
E4-5	5%	Companies should include specific metrics that reflect its significant impacts on biodiversity and ecosystem health.
E4-6	0%	Expected financial outcomes linked to biodiversity and ecosystem risks and opportunities.
S3.SBM-3	0%	Companies shall illustrate the identified material IRO and corresponding interaction with strategy and business model.
S3-1	4%	It requires companies to disclose policies set related to the influenced communities.
S3-2	8%	The company should clearly outline its general approach for engaging with communities affected by its operations and their representatives, including how it addresses actual and potential impacts on these communities.
S3-3	4%	Companies shall disclose what processes they have taken to reduce negative impacts they bring to communities and what are the channels for them to bring up concerns.
S3-4	12%	Companies shall provide detailed actions it takes to address significant impacts on affected communities, manage material risks, and pursue opportunities related to these communities. Companies shall also indicate the effectiveness of the actions.
S3-5	8%	Companies should set and disclose specific, time-bound targets related to affected communities.
S4-1	3%	Companies shall provide policies they have in place related to the consumers and end-users.
S4-2	17%	Companies should be provide information about how they interact with their customers and end-users regarding the impacts on them.
S4-3	8%	Companies need to detail the processes they have in place for addressing negative impacts on consumers and end-users.
S4-4	8%	Companies must outline its established processes for addressing or assisting in the mitigation of negative impacts on associated consumers and end-users. Additionally, it should detail the available channels for these individuals to voice concerns and resolve issues.
S4-5	0%	What are the targets of companies to manage IRO.
G1.GOV-1	43%	Companies shall disclose roles and expertise of management bodies in the business conduct field.

Disclosure Topics	Compliance Level	Content
G1-1	55%	Companies are expected to disclose their policies concerning business conduct and elaborate on how they cultivate their corporate culture.
G1-2	56%	Companies should provide detailed information regarding their supplier relationship management and the consequent impacts on their supply chain.
G1-3	54%	Organizations should detail their systems for preventing, detecting, investigating, and responding to corruption and bribery allegations or incidents. This disclosure should include information about related training programs.
G1-4	25%	Companies are required to report on any corruption or bribery incidents that occurred during the reporting period.
G1-5	11%	Companies shall disclose its political impact and lobbying activities.
G1-6	4%	Companies shall provide information about their payment practices, especially late payments.

Table A 4 Sustainability Matters Covered in Topical ESRS

Source: (European Commission, 2023, pp. 24-26)

Topical ESRS	Sustainability matters covered in topical ESRS		
	Topic	Sub-topic	Sub-sub-topics
ESRS E1	Climate change	<ul style="list-style-type: none"> · Climate change adaptation · Climate change mitigation · Energy 	
ESRS E2	Pollution	<ul style="list-style-type: none"> · Pollution of air · Pollution of water · Pollution of soil · Pollution of living organisms and food resources · Substances of concern · Substances of very high concern · Microplastics 	

Topical ESRS	Sustainability matters covered in topical ESRS		
	Topic	Sub-topic	Sub-sub-topics
ESRS E3	Water and marine resources	<ul style="list-style-type: none"> · Water · Marine resources 	<ul style="list-style-type: none"> · Water consumption · Water withdrawals · Water discharges · Water discharges in the oceans · Extraction and use of marine resources
ESRS E4	Biodiversity and ecosystems	<ul style="list-style-type: none"> · Direct impact drivers of biodiversity loss 	<ul style="list-style-type: none"> · Climate Change · Land-use change, fresh water-use change and sea-use change · Direct exploitation · Invasive alien species · Pollution · Others
		<ul style="list-style-type: none"> · Impacts on the state of species 	<p>Examples:</p> <ul style="list-style-type: none"> · Species population size · Species global extinction risk
		<ul style="list-style-type: none"> · Impacts on the extent and condition of ecosystems 	<p>Examples:</p> <ul style="list-style-type: none"> · Land degradation · Desertification · Soil sealing
		<ul style="list-style-type: none"> · Impacts and dependencies on ecosystem services 	
ESRS E5	Circular economy	<ul style="list-style-type: none"> · Resources inflows, including resource use · Resource outflows related to products and services · Waste 	
ESRS S1	Own workforce	<ul style="list-style-type: none"> · Working conditions 	<ul style="list-style-type: none"> · Secure employment · Working time · Adequate wages · Social dialogue · Freedom of association, the existence of works councils and the

Topical ESRS	Sustainability matters covered in topical ESRS		
	Topic	Sub-topic	Sub-sub-topics
			<p>information, consultation and participation rights of workers</p> <ul style="list-style-type: none"> · Collective bargaining, including rate of workers covered by collective agreements · Work-life balance · Health and safety
		<ul style="list-style-type: none"> · Equal treatment and opportunities for all 	<ul style="list-style-type: none"> · Gender equality and equal pay for work of equal value · Training and skills development · Employment and inclusion of persons with disabilities · Measures against violence and harassment in the workplace · Diversity
		<ul style="list-style-type: none"> · Other work-related rights 	<ul style="list-style-type: none"> · Child labour · Forced labour · Adequate housing · Privacy
ESRS S2	Workers in the value chain	<ul style="list-style-type: none"> · Working conditions 	<ul style="list-style-type: none"> · Secure employment · Working time · Adequate wages · Social dialogue · Freedom of association, including the existence of work councils · Collective bargaining · Work-life balance · Health and safety
		<ul style="list-style-type: none"> · Equal treatment and opportunities for all 	<ul style="list-style-type: none"> · Gender equality and equal pay for work of equal value · Training and skills development · The employment and inclusion of persons with disabilities

Topical ESRS	Sustainability matters covered in topical ESRS		
	Topic	Sub-topic	Sub-sub-topics
			<ul style="list-style-type: none"> Measures against violence and harassment in the workplace Diversity
		<ul style="list-style-type: none"> Other work-related rights 	<ul style="list-style-type: none"> Child labour Forced labour Adequate housing Water and sanitation Privacy
ESRS S3	Affected communities	<ul style="list-style-type: none"> Communities' economic, social and cultural rights 	<ul style="list-style-type: none"> Adequate housing Adequate food Water and sanitation Land-related impacts Security-related impacts
		<ul style="list-style-type: none"> Communities' civil and political rights 	<ul style="list-style-type: none"> Freedom of expression Freedom of assembly Impacts on human rights defenders
		<ul style="list-style-type: none"> Rights of indigenous peoples 	<ul style="list-style-type: none"> Free, prior and informed consent Self-determination Cultural rights
ESRS S4	Consumers and end-users	<ul style="list-style-type: none"> Information-related impacts for consumers and/or end-users 	<ul style="list-style-type: none"> Privacy Freedom of expression Access to (quality) information
		<ul style="list-style-type: none"> Personal safety of consumers and/or end-users 	<ul style="list-style-type: none"> Health and safety Security of a person Protection of children
		<ul style="list-style-type: none"> Social inclusion of consumers and/or end-users 	<ul style="list-style-type: none"> Non-discrimination Access to products and services Responsible marketing practices
ESRS G1	Business conduct	<ul style="list-style-type: none"> Corporate culture Protection of whistle-blowers Animal welfare 	

Topical ESRS	Sustainability matters covered in topical ESRS		
	Topic	Sub-topic	Sub-sub-topics
		<ul style="list-style-type: none"> Political engagement and lobbying activities Management of relationships with suppliers including payment practices 	
		<ul style="list-style-type: none"> Corruption and bribery 	<ul style="list-style-type: none"> Prevention and detection including training Incidents

APPENDIX B: Original Analysis

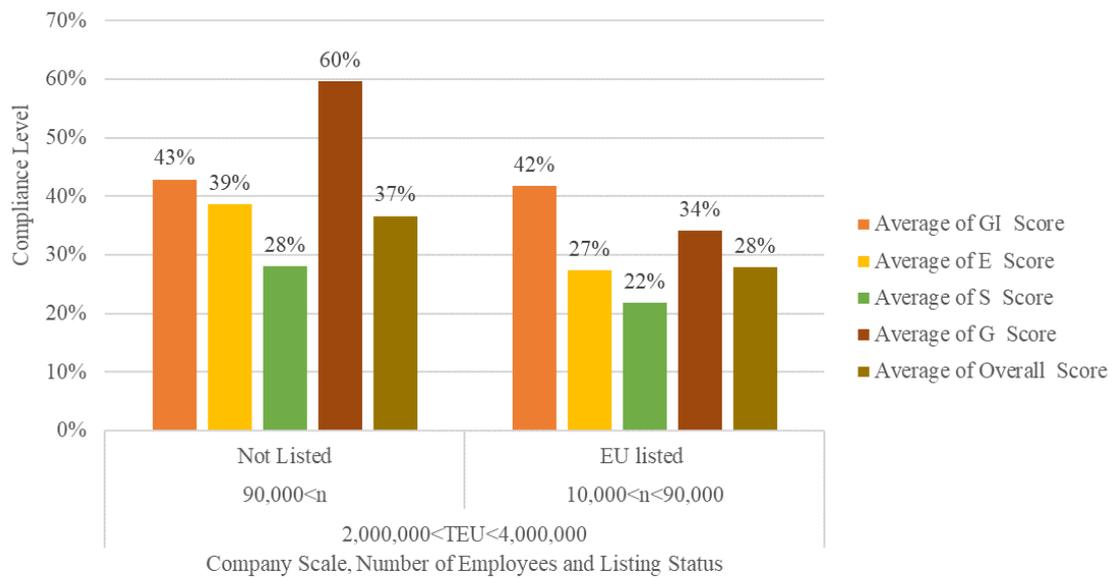


Figure A 2 Compliance Levels by Listing Status for Companies with 2,000,000 < TEU < 4,000,000

Source: Author

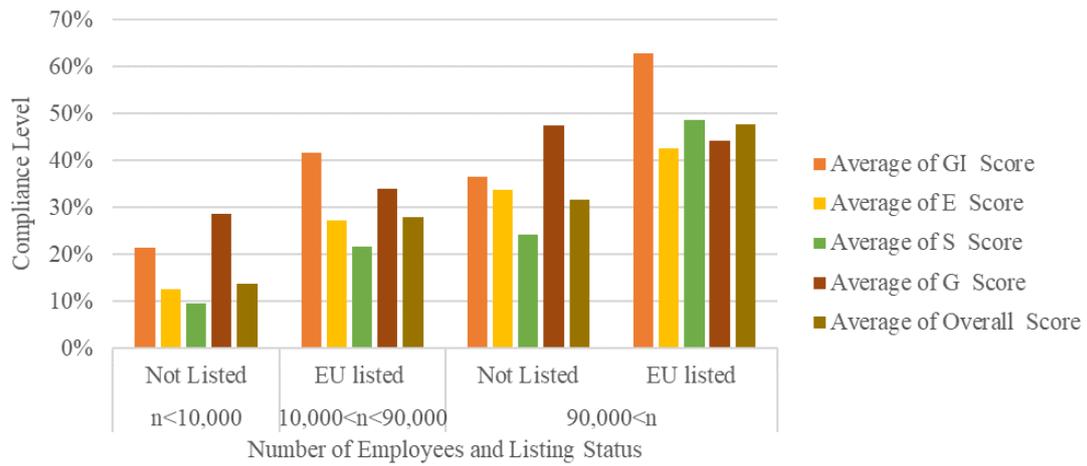


Figure A 3 Compliance Levels by Number of Employees and Listing Status

Source: Author

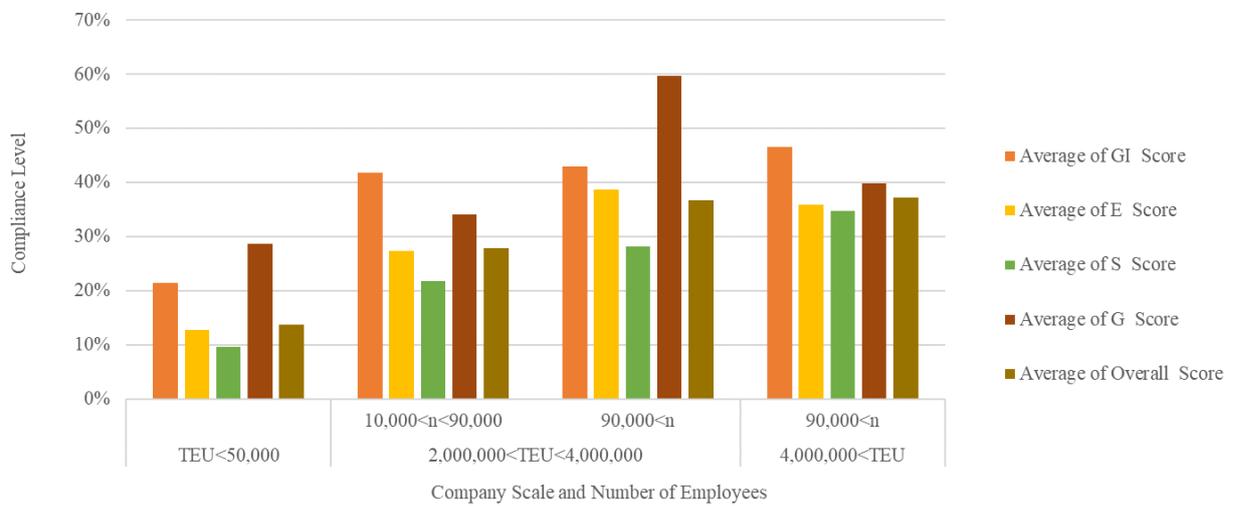


Figure A 4 Compliance Levels by Company Scale and Number of Employees

Source: Author

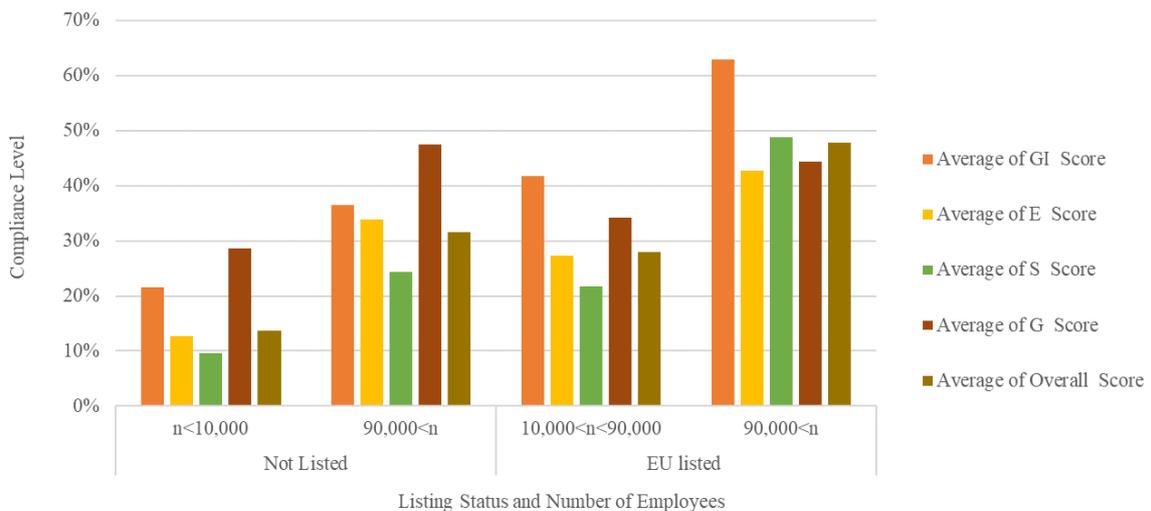


Figure A 5 Compliance Levels by Listing Status and Number of Employees

Source: Author

References

- Abdulla Yusuf Al, H., & Amina, B. (2021). A worldwide sectorial analysis of sustainability reporting and its impact on firm performance. *Journal of Sustainable Finance & Investment*, 12, 62-86. doi:10.1080/20430795.2021.1903792
- Almashhadani, M., & Almashhadani, H. A. (2023). The Impact of Sustainability Reports to Enhance Company Performance and its Sustainability. *International Journal of Scientific and Management Research*, 6(9), 149-163.
- Alphaliner. (2024). Alphaliner TOP 100. Retrieved from <https://alphaliner.axsmarine.com/PublicTop100/>
- Al-Shaer, H., & Hussainey, K. (2022). Sustainability reporting beyond the business case and its impact on sustainability performance: UK evidence. *Journal of Environmental Management*, 311, 114883. doi:<https://doi.org/10.1016/j.jenvman.2022.114883>
- Amina, B. (2019). Sustainability reporting and firm's performance. *International Journal of Productivity and Performance Management*, 69, 431-445. doi:10.1108/ijppm-10-2018-0371
- Anastasiya, Z. (2022). content analysis. *The Fairchild Books Dictionary of Fashion*. doi:10.4135/9781412961288.n73
- Anderson, K. (2024). What is the Non-Financial Reporting Directive (NFRD)? Retrieved from Greenly.Institute: <https://greenly.earth/en-us/blog/company-guide/what-is-the-non-financial-reporting-directive-nfrd>
- Baekmark, C. (2024). How the global shipping industry may be impacted by the European Corporate Sustainability Reporting Directive (CSRD). Retrieved from BIMCO: <https://www.bimco.org/insights-and-information/safety-security-environment/20240201-how-the-eu-csrd-may-impact-global-shipping>
- Broniewicz, E., Jastrzębska, E., & Lulewicz-Sas, A. (2024). Environmental disclosures according to ESRS in ESG reporting of selected banks in Poland. *Economics and Environment*, 88(1). doi:10.34659/eis.2024.88.1.719
- Carolan, P. (2022). The history and evolution of the Maritime Industry. Retrieved from cribbcs: <https://cribbcs.net/the-history-and-evolution-of-the-maritime-industry/>
- CDSB. (2022). Framework for reporting environmental and social information. Retrieved from CDSB: <https://www.cdsb.net/what-we-do/reporting-frameworks/environmental-information-natural-capital>
- Claus-Heinrich, D. (2007). Assessing the quality of sustainability reporting: an alternative methodological approach. *Journal of Cleaner Production*, 15, 75-85. doi:10.1016/J.JCLEPRO.2005.08.013
- Coe, K., & Scacco, J. M. (2017). Content Analysis, Quantitative. In *The International Encyclopedia of Communication Research Methods* (pp. 1-11).
- Council of the EU. (2024). Council and Parliament agree to delay sustainability reporting for certain sectors and third-country companies by two years. Retrieved from European Council Press Release: <https://www.consilium.europa.eu/en/press/press-releases/2024/02/07/council-and-parliament-agree-to-delay-sustainability-reporting-for-certain-sectors-and-third-country-companies-by-two-years/>

- Econometrics Community. (2023). Introduction to Quantitative Research Methods | Content Analysis. Retrieved from 360doc Personal Library: http://www.360doc.com/content/23/0420/03/45289182_1077324810.shtml
- EFRAG. (2024). About us. Retrieved from EFRAG: <https://www.efrag.org/en/about-us>
- EFRAG. (2024). EFRAG IG 3 List of ESRS Data Points. Retrieved from EFRAG: <https://efrag.sharefile.com/public/share/web-s6e410fb208aa4685bf9c482ee405f48d>
- EFRAG. (2024). Sector-specific ESRS Introduction. Retrieved from <https://www.efrag.org/en/sustainability-reporting/esrs-workstreams/sectorspecific-esrs>
- EFRAG. (2024). TNFD - ESRS CORRESPONDENCE MAPPING. Retrieved from EFRAG: <https://www.efrag.org/Assets/Download?assetUrl=/sites/webpublishing/SiteAssets/TNFD+ESRS+Correspondence+mapping+Final.pdf>
- Elo, S., & Kyngäs, H. (2008). The qualitative content analysis process. *Journal of advanced nursing*, 62 1, 107-115. doi:10.1111/j.1365-2648.2007.04569.x
- European Commission & Secretariat-General. (2019). COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE EUROPEAN COUNCIL, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS The European Green Deal. Retrieved from EUR-Lex: <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM%3A2019%3A640%3AFIN>
- European Commission. (2022). Corporate sustainability reporting. Retrieved from https://finance.ec.europa.eu/capital-markets-union-and-financial-markets/company-reporting-and-auditing/company-reporting/corporate-sustainability-reporting_en
- European Commission. (2022). Sustainable finance. Retrieved from Newsroom: <https://ec.europa.eu/newsroom/fisma/items/754701/en>
- European Commission. (2022). The European Green Deal. Retrieved from The European Green Deal: https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/european-green-deal_en
- European Commission. (2023). ANNEX I EUROPEAN SUSTAINABILITY REPORTING STANDARDS (ESRS). Retrieved from https://eur-lex.europa.eu/resource.html?uri=cellar:a17f44bd-2f9c-11ee-9e98-01aa75ed71a1.0008.02/DOC_2&format=PDF
- European Parliament & Council of the European Union. (2023). DIRECTIVE 2013/34/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL. Retrieved from EUR-Lex: <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:02013L0034-20240528>
- European Parliament. (2021). BRIEFING Implementation Appraisal. Retrieved from [https://www.europarl.europa.eu/RegData/etudes/BRIE/2021/654213/EPRS_BRI\(2021\)654213_EN.pdf](https://www.europarl.europa.eu/RegData/etudes/BRIE/2021/654213/EPRS_BRI(2021)654213_EN.pdf)
- Falkenberg, C., Schneeberger, C., & Pöchtrager, S. (2023). Is Sustainability Reporting Promoting a Circular Economy? Analysis of Companies' Sustainability Reports in the Agri-Food Sector in the Scope of Corporate Sustainability Reporting Directive and EU Taxonomy Regulation. *Sustainability*, 15(9). doi:10.3390/su15097498
- FISMA . (2023). The Commission adopts the European Sustainability Reporting Standards.

- Retrieved from News: https://finance.ec.europa.eu/news/commission-adopts-european-sustainability-reporting-standards-2023-07-31_en
- FISMA . (2024). Frequently asked questions on the implementation of the EU corporate sustainability reporting rules. Retrieved from General publications: https://finance.ec.europa.eu/document/download/c4e40e92-8633-4bda-97cf-0af13e70bc3f_en?filename=240807-faqs-corporate-sustainability-reporting_en.pdf
- FISMA. (2022). Overview of sustainable finance. Retrieved from https://finance.ec.europa.eu/sustainable-finance/overview-sustainable-finance_en#the-eu-sustainable-finance-framework
- Forman, J., & Damschroder, L. (2007). Qualitative Content Analysis. 11. doi:10.1016/S1479-3709(07)11003-7
- Fornasari, T., & Traversi, M. (2024). The Impact of the CSRD and the ESRS on Non-Financial Disclosure. *Symphonya. Emerging Issues in Management*(1), 117-133. doi:10.4468/2024.1.07fornasari.traversi
- Giner, B., & Luque-Vílchez, M. (2022). A commentary on the “new” institutional actors in sustainability reporting standard-setting: a European perspective. *Sustainability Accounting, Management and Policy Journal*, 13(6), 1284-1309. doi:10.1108/sampj-06-2021-0222
- GRI. (2020). Our mission and history. Retrieved from GRI: <https://www.globalreporting.org/about-gri/mission-history/>
- Higgins, C., Milne, M., & Gramberg, B. (2015). The Uptake of Sustainability Reporting in Australia. *Journal of Business Ethics*, 129, 445-468. doi:10.1007/S10551-014-2171-2
- Hummel, K., & Jobst, D. (2024). An overview of corporate sustainability reporting legislation in the European Union. *Accounting in Europe*, 1-36.
- Hurst, A. (2023). Chapter 17. Content Analysis. Retrieved from Open Educational Resources OERU, Oregon State University: <https://open.oregonstate.education/qualresearchmethods/chapter/chapter-17-content-analysis/>
- Huxley, K. L. (2020). Content Analysis, Quantitative. SAGE Research Methods Foundations.
- IFRS . (2022). Climate Disclosure Standards Board. Retrieved from IFRS : <https://www.ifrs.org/sustainability/climate-disclosure-standards-board/>
- IFRS. (2022). IFRS Foundation completes consolidation with Value Reporting Foundation. Retrieved from IFRS: <https://www.ifrs.org/news-and-events/news/2022/08/ifrs-foundation-completes-consolidation-with-value-reporting-foundation/>
- IFRS. (2022). SASB Standards. Retrieved from IFRS: <https://www.ifrs.org/issued-standards/sasb-standards/>
- IFRS. (2023). ISSB and TCFD. Retrieved from IFRS: <https://www.ifrs.org/sustainability/tcfdf/>
- IFRS. (2023). Supplementary ISSB Update April 2023. Retrieved from IFRS: <https://www.ifrs.org/news-and-events/updates/issb/2023/supplementary-issb-update-april-2023/>
- IFRS. (2024). Integrated reporting. Retrieved from IFRS: <https://www.ifrs.org/issued-standards/integrated-reporting/>
- IIRC. (2024). 10 Years of the IIRC. Retrieved from 10 Years of the IIRC:

- <https://integratedreporting.ifrs.org/10-years/10-years-summary/>
- Indulska, M., Hovorka, D. S., & Recker, J. (2012). Quantitative approaches to content analysis: identifying conceptual drift across publication outlets. *European Journal of Information Systems*, 21(1), 49-69. doi:10.1057/ejis.2011.37
- International Maritime Organization. (2015). Marine Environment. Retrieved from International Maritime Organization: <https://www.imo.org/en/OurWork/Environment/Pages/Default.aspx>
- Jager, A. d. (2022). Fail to Plan, Plan to Fail: What the ESRS Means for ESG Reporting. Retrieved from Nexio Project: <https://blog.nexioprospects.com/fail-to-plan-plan-to-fail-what-the-esrs-means-for-esg-reporting>
- Kimberly, A. N., & Anup, K. (2015). Content Analysis. doi:10.1002/9781118541555.wbiepc065
- KPMG. (2024). Get ready for the next wave of ESG reporting. Retrieved from <https://kpmg.com/xx/en/home/insights/2023/01/get-ready-for-the-next-wave-of-esg-reporting.html>
- Lawrence, L., Thomas, T., & Yu, W. (2017). Sustainability Reporting and Firm Value: Evidence from Singapore-Listed Companies. *Sustainability*, 9, 2112. doi:10.3390/SU9112112
- Lu, B., Ming, X., Lu, H., Chen, D., & Duan, H. (2023). Challenges of decarbonizing global maritime container shipping toward net-zero emissions. *npj Ocean Sustainability*, 2(1), 11. doi:10.1038/s44183-023-00018-6
- Luo, A. (2023). Content Analysis | Guide, Methods & Examples. Retrieved from Scribbr: <https://www.scribbr.com/methodology/content-analysis/>
- Melzattia, S. (2018). The Importance of Sustainability Reports In Non-Financial Companies. *Jurnal Akuntansi*, 22, 368. doi:10.24912/ja.v22i3.394
- Mezzanotte, F. E. (2024). Corporate sustainability reporting: double materiality, impacts, and legal risk. *Journal of Corporate Law Studies*, 23(2), 633-663. doi:10.1080/14735970.2024.2319058
- Nömmela, K., & Kõrbe Kaare, K. (2022). Incorporated Maritime Policy Concept: Adopting ESRS Principles to Support Maritime Sector's Sustainable Growth. *Sustainability*, 14(20). doi:10.3390/su142013593
- Odobaša, R., & Marošević, K. (2023). Expected contributions of the European corporate sustainability reporting directive (CSRD) to the sustainable development of the European union. *EU and comparative law issues and challenges series (ECLIC)*, 7, 593-612.
- Paperpile. (2022). How to do a content analysis. Retrieved from Paperpile: <https://paperpile.com/g/content-analysis/#step-1-develop-your-research-questions>How to do a content analysis
- Prasad, B. D. (2019). Qualitative Content Analysis: Why is it Still a Path Less Taken? , 20. doi:10.17169/FQS-20.3.3392
- Primec, A., & Belak, J. (2022). Sustainable CSR: Legal and Managerial Demands of the New EU Legislation (CSRD) for the Future Corporate Governance Practices. *Sustainability*, 14(24). doi:10.3390/su142416648
- Próchniak, J., & Płoska, R. (2023). WIG-20 Warsaw Stock Exchange Companies: Are They

- Ready for Governance Matters Disclosures Based on EU Sustainable Reporting Standards? *Annales Universitatis Mariae Curie-Skłodowska, sectio H – Oeconomia*, 56(5), 227-246. doi:10.17951/h.2022.56.5.227-246
- Publications Office of the European Union. (2019). Disclosure of non-financial and diversity information by large companies and groups. Retrieved from EUR-Lex: <https://eur-lex.europa.eu/EN/legal-content/summary/disclosure-of-non-financial-and-diversity-information-by-large-companies-and-groups.html>
- Rezaee, Z. (2016). Business sustainability research: A theoretical and integrated perspective. *Journal of Accounting Literature*, 36, 48-64. doi:10.1016/J.ACCLIT.2016.05.003
- Rourke, L., & Anderson, T. (2004). Validity in quantitative content analysis. *Educational technology research and development*, 52(1), 5-18.
- SASB. (2024). SASB standard-setting process. Retrieved from SASB: <https://sasb.ifrs.org/standards/process/>
- Scamans, S. (2024). Corporate Sustainability Reporting Directive's (CSRD) impacts on stakeholders: an analysis of the European Sustainability Reporting Standards (ESRS).
- TCFD. (2024). About. Retrieved from TCFD: <https://www.fsb-tcfd.org/about/>
- The CSRD Compass. (2023). CSRD Non Compliance: The Consequences of Not Complying. Retrieved from <https://thecsrcompass.com/csr-non-compliance-the-consequences-of-not-complying/>
- TNFD. (2023). Final TNFD Recommendations on nature related issues published and corporates and financial institutions begin adopting. Retrieved from TNFD News: <https://tnfd.global/final-tnfd-recommendations-on-nature-related-issues-published-andcorporates-and-financial-institutions-begin-adopting/>
- Transport & Environment. (2024). Climate impact of shipping. Retrieved from Transport & Environment: <https://www.transportenvironment.org/topics/ships/climate-impact-shipping>
- UN Trade and Development. (2023). Review of Maritime Transport. Retrieved from <https://unctad.org/publication/review-maritime-transport-2023>
- United Nations. (2020). The Sustainable Development Agenda. Retrieved from Sustainable Development Goals: <https://www.un.org/sustainabledevelopment/development-agenda-retired/>
- United Nations. (2022). Sustainable Development Goals. Retrieved from United Nations Academic Impact: <https://www.un.org/en/academic-impact/page/sustainable-development-goals>
- Victoria, P., Floros, F., Georgios, A. D., & Konstantina, K. A. (2023). Sustainability Reporting: Examining the Community Impact of the S&P500 Companies. *Sustainability*. doi:10.3390/su151813681
- Weare, C., & Wan-Ying, L. (2000). Content Analysis of the World Wide Web. *Social Science Computer Review*, 18, 272-292. doi:10.1177/089443930001800304
- White, M., & Emily, E. M. (2006). Content Analysis: A Flexible Methodology. *Library Trends*, 55, 22-45. doi:10.1353/lib.2006.0053
- Wikipedia contributors. (2024). Integrated reporting. Retrieved from Wikipedia: https://en.wikipedia.org/wiki/Integrated_reporting

- Wikipedia contributors. (2024). Sustainability Accounting Standards Board. Retrieved from Wikipedia:
https://en.wikipedia.org/wiki/Sustainability_Accounting_Standards_Board#cite_note-2
- Wilfried, B., & Tarnai, C. (1999). Content analysis in empirical social research. *International Journal of Educational Research*, 31, 659-671. doi:10.1016/S0883-0355(99)00032-4
- Zeynep, S., & Fikret, Ç. (2019). The Importance of Sustainability and Sustainability Reporting. *Accounting, Finance, Sustainability, Governance & Fraud: Theory and Application*. doi:10.1007/978-981-32-9588-9_4
- Zhou, Y., Wang, X., & Yuen, K. F. (2021). Sustainability disclosure for container shipping: A text-mining approach. *Transport Policy*, 110, 465-477. doi:<https://doi.org/10.1016/j.tranpol.2021.06.020>