Bachelor's thesis

NTNU
Norwegian University of Science and Technology
Faculty of Information Technology and Electrical Engineering
Department of Computer Science

Mikkel Maakestad Enghaug
Rasmus Liljeholm Hallan

The Demand for Specialised ESG Reporting Software in The Norwegian ESG Landscape

Bachelor's thesis in Digital Business Development
Supervisor: Marthe Holum
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Abstract

In the complex field of ESG reporting, companies have various ways to handle and report their ESG data. Some companies use external consultants to report, and other utilises their own in-house developed solutions to keep track of and report on their ESG data. The Norwegian company Celsia has developed a software to calculate and report on data required by the newly arrived EU Taxonomy. This study investigates how Celsia can expand its services to new areas within ESG by utilising information regarding the demand for specialised ESG software among Norwegian companies.

With data collected through a survey distributed to publicly listed companies in Norway, we deduced several interesting findings. One of our findings suggested a pending demand for specialised ESG reporting software among the companies. Our analysis shows that this demand may increase when upcoming regulatory standards and frameworks specifying detailed requirements on how and what to report are implemented. Another important finding was that quantitative ESG metrics had a higher degree of software usage than more qualitative ESG metrics. Further, we found that the Social and Governmental pillars of ESG have low use of specialised software and can be interesting areas to direct a potential expansion of service for Celsia.

Sammendrag

ESG-rapportering er et komplekst fagfelt der selskaper har ulike måter å håndtere og rapportere ESG-data på. Noen selskaper bruker eksterne konsulenter for å rapportere, mens andre bruker egenutviklede løsninger for å holde styr og rapportere på ESG-data. Det norske selskapet Celsia har utviklet en programvare for å beregne og rapportere data i forbindelse med den nyankomne EU-taksonomien. Denne studien undersøker hvordan Celsia kan ekspandere sine tjenester til nye områder innenfor ESG ved å bruke informasjon om etterspørselen etter spesialisert ESG-programvare blant norske selskaper.

Med data samlet inn gjennom en undersøkelse distribuert til børsnoterte selskaper i Norge, utledet vi flere interessante funn. Det ble funnet en viss etterspørsel etter spesialisert ESG-rapporteringsprogramvare blant selskapene. Vår analyse viser at denne etterspørselen kan øke når kommende regulatoriske standarder og rammeverk, som spesifiserer detaljerte krav til hvordan og hva som skal rapporteres på, iverksettes. Videre fant vi ut at de sosiale og forretningsetiske pilarene innenfor ESG har lav bruk av spesialisert programvare og kan være interessante områder å rette en potensiell ekspansjon av tjenester.

Preface

The bachelor thesis is written for *Institutt for Datateknologi og Informatikk* at NTNU (Department of Computer Science). The thesis marks the end of our bachelor's degree in *Digital Forretningsutvikling* (Digital Business Development).

At the beginning of November 2021, we began the search to find relevant companies to collaborate with on our bachelor thesis. After several positive feedbacks from different companies, we got the opportunity to work with Celsia. We chose Celsia because of the highly innovative environment they operate in and their mission to be a positive impact on a new and rapidly changing world of sustainability reporting. It was an opportunity for a mutually beneficial collaboration for both us and Celsia. We would be able to apply our acquired knowledge from our degree on a highly relevant subject whilst giving new insights to Celsia on the market they operate in.

We want to thank our supervisor Marthe Holum for the assistance and guidance throughout the bachelor period, and Anders Habostad at Celsia for the thesis, assistance, and the freedom to adapt the research to fit our academic background.

Trondheim – Norway, May 2022
Rasmus Liljeholm Hallan & Mikkel Maakestad Enghaug

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Abbreviations

UN	United Nations
ESG	Environmental, Social, and Governance
EU	European Union
SDG	Social Development Goal
SRI	Socially responsible investment strategies
SASB	Sustainable Accounting Standards Board
SEC	U. S. Securities and Exchange Commission
IFRS	International Financial Reporting Standards
ISSB	International Sustainability Standards Board
GSSB	Global Sustainability Standards Board
GRI	Global Reporting Initiative
NFRD	Non-Financial Reporting Directive
CSRD	Corporate Sustainability Reporting Directive
EFRAG	European Financial Reporting Advisory Group
COP26	26th UN Climate Change Conference of the Parties
CSR	Company Social Responsibility
EEA	European Economic Area
SME	Small medium enterprises
SaaS	Software-as-a-Service
TAM	Technology Acceptance Model
IS/IT	Information systems/information technology
IT	Information technology
OSE	Norwegian Stock Exchange
CFO	Chief Financial Officer
CEO	Chief Executive Officer
GHG	Greenhouse Gas
CTO	Chief Technical Officer
ARP	Aktivitets- og redgjørelsesplikten
GDPR	General Data Protection Regulation
CSO	Chief Sustainable Officer
GFC	Global Financial Crisis
CRA	credit rating agencies

1 Introduction

The importance of sustainability has drastically increased over the past decades. The need for a green transmission in the business world has given sustainability severe traction among companies worldwide. In the United Nations (UN) report *Our Common Future*, also known as the "Brundtland Report", is where sustainability is first defined as "Development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (United Nations, 1987, p. 37). Furthermore, the report states that "Yet, in the end, sustainable development is not a fixed state of harmony, but rather a process of change in which the exploitation of resources, the direction of investments, the orientation of technological development, and institutional change are made consistent with future as well as present needs" (United Nations, 1987, p. 15). This highlights that sustainability does regard not only natural resources but also includes social and economic resources.

To push member countries toward creating a sustainable future, the UN issued an Agenda for Sustainable Development in 2015, including 17 goals and 169 targets (United Nations, 2015, p. 13). All member states have adopted the agenda, and it will work as a blueprint for a sustainable future. Member countries get ranked and measured against one another on their progress to reaching the 17 goals. Furthermore, the member countries deliver National Reviews that showcase their progress and strategy to reach the goals (Norwegian ministry, 2021).

Several plans and treaties have been initiated to achieve the UN sustainability goals. The Paris Agreement is arguably the most recognised and well-known agreement created for achieving the sustainability goals by the United Nations. The Paris Agreement was signed and agreed upon by 195 countries in 2015 (United Nations Climate Change, 2022). The international treaty predominantly focuses on governments and political institutions and relies on these sectors to create change. However, to achieve sustainability and reach the goals put forward by the United Nations, all parts of society need to be engaged in the change-making process. Therefore, corporations and businesses are critical parts of society we need to involve and incentivise to become part of the necessary change towards a sustainable future.

A significant tool for achieving the sustainability development goals (SDGs) is to implement regulatory requirements for companies' information on Environmental (E), Social (S), and Governance (G). This is known as the ESG criteria (Plastun et al., 2022, p. 231). The ESG criteria form a report that discloses how sustainable a company is. The ESG report will give a clear overview of the companies' sustainability and drive investments and interest toward companies with solid sustainable prospects. It will also give investors and stakeholders insight into non-financial information about the company.

A more direct approach to reaching the SDGs regarding the environment is the EU Taxonomy (European Comission, 2022). The taxonomy is a classification system where one classifies environmentally sustainable economic activities. The classification will

allow investors and other stakeholders to steer away from companies that greenwash [1], help companies invest more climate-friendly, mitigate market fragmentation and help shift investments towards sustainable entities (European Comission, 2022).

To report on these assessments will be mandatory in the near future but completing these actions can be complex and resource intensive. Several businesses have emerged to help companies conduct ESG assessments and get taxonomy scores. Celsia is one of these, helping companies get their Taxonomy Score by using a software system. This paper will try to disclose what type of demand there is in the Norwegian stock exchange for such specialised software assessing the aspects of ESG.

1.1 Problem Statement

The study has the following problem statement:

"What are the present and future demands for specialised ESG software among Norwegian companies, and how can Celsia utilise this information to expand their services?"

Through our thesis, we investigate what the demand is for specialised software used to report on ESG metrics among Norwegian companies. By demand, we refer to the companies' willingness to pay for this service, their technical specifications for the system, and their general needs for the system. By expand, we refer to how Celsia can further develop its business based on these demands.

[1] Greenwashing is the process of providing a false impression and misleading information about products for a company to make the more environmentally sound. Is done to deceive customer into thinking that the products are more environmentally friendly (Kenton, Greenwashing, 2022)

2 Theoretical background

In order to assess and comment on possible trends and signs of demand from the results, we needed to find relevant theory that could work as a supporting foundation to explain the findings from our results, and by this give a deeper insight into the complexity of the ESG landscape.

2.1 What is ESG?

Environmental, social, and governance (ESG) is non-financial information and data about a company valuable to its stakeholders. The term originated from what is known as socially responsible investment strategies (SRI), which have roots back in the 19th century when social consideration and restrictions in investment decisions were first practised (Eccles et al., 2019, p. 577). It is only in recent times that the investment communities have embraced ESG. The goal of the United Nations Global Compact[2] (2004) report *Who Cares Wins: Connecting Financial Markets to a Changing World* was to develop guidelines to integrate better environmental (e.g., carbon emissions, water consumption, waste generation), social (e.g., employee makeup, product information) and corporate governance (e.g., lobbying, anti-corruption programs, board diversity) data in the operations of financial institutions (Eccles et al., 2019, p. 577). The report represents the start of the increased focus on ESG-factors in the business world, which we have seen the effect of in the last two decades (Li et al., 2021, p. 1). The three aspects of ESG are based on ten principles initiated by the UN Global Compact. The principles lie within human rights, labour, environment, and anti-corruption (United Nations Global Compact, n.d.).

ESG-reporting today, in its current form, is more of a buzzword around the demand for non-financial performance than a solution (Ramanna & Kaplan, 2021, p. 2). This is perhaps a result of the absence of a framework needed to make ESG-reporting a good solution for reporting on non-financial performance. With no universal and statutory framework, the ESG-reporting landscape has four significant issues; ESG data and measurement, the subjective evaluation of the importance of different ESG metrics, and objectivity, uniformity, and transparency. The following sections will elaborate on these issues.

2.1.1 ESG-data and measurement

ESG-data is the data that reveals how green and sustainable a company is by giving metrics on how well the company scores on the Environmental, Social, and Governance factors (Reformis, 2022). Also, it is being used by the stakeholders when evaluating the company. The issue with ESG-data is the sheer variation in the data, how it is reported, and the calculation methods used to measure the metrics (Kotsantonis & Serafiem, 2019, p. 1). The problem stems from the multitude of methodologies, regulations, and standards used. This confuses organisations and undermines the collective trust in ESG as a concept" (Courtnell, 2021).

[2] The United Nations Global Compact is a strategic initiative that supports global companies committed to responsible business practices in human rights, labour, the environment, and corruption (Kenton, United Nations Global Compact, 2020).

Unlike financial reporting, which is based on cash flow and has a well-understood commodity like money, where all agree to one value, ESG-data has far more data points considered, and the valuation of each instance is different. This makes it very difficult to do a similar reliable value translation like financial data, especially for the Social and Governance pillars (Ramanna & Kaplan, 2021, p. 2). The result is that inconsistent and various use of data and methods leads to many ways to report on the metrics, even within the same company (Kotsantonis & Serafiem, 2019, p. 13). Deloitte Norway investigated 31 of Norway's 50 biggest companies and found that the main reason for inadequate reporting is that collecting, structuring, and measuring ESG-data is challenging (Deloitte, 2021). This is because the datasets are incomplete and inadequate, and the processes lack automation.

2.1.2 The importance of different metrics

"Without a widely held consensus on the purpose of the corporation in society, judgements about what to measure, how to measure, and how to aggregate ESG-data are ad-hoc and subject to manipulation" (Ramanna & Kaplan, 2021, p. 12). Due to the low regulation of ESG-reportings, companies can essentially choose which parts of the report they want to emphasise and which parts they will not focus on. The subjective nature of the company affects the judgement of what metrics should be more weighted and covered than others. It makes it complicated for stakeholders to objectively assess the companies' sustainability and moral position (Ramanna & Kaplan, 2021, p. 5).

2.1.3 Objectivity, uniformity, and transparency

With the combination of a missing framework, inadequate and scarce data, and different views on what is essential in the report, the problem with objectivity arises. A company can, primarily if they conduct the ESG-reporting themselves, choose not to report negative data and scores in their ESG-reporting (LaBella et al., 2019, p. 2). This is possible because it is easy to choose the data that gives the company falsely good ESG-reporting scores. In a report from the Sustainable Accounting Standards Board (SASB), over 90% of known negative events and the data backing of these events were not disclosed in either the SEC filings[3] or sustainability reports (LaBella et al., 2019, p. 2). Labella et al. (2019) says this divergence stems from the different views of what is important and the weightings of the E, S and G in the reports and is made possible through the low regulations and the weightings on the importance of different metrics.

Uniformity is another issue and refers to "the quality or fact of being the same, or of not changing or being different in any way" (Cambridge Dictionary, 2022). Uniformity in accounting requires organisations to report financials and financial statements following a framework (AccountingTools, 2021). Uniformity ensures that all financial reports, both how they are executed and presented, are the same for every organisation and makes it easy to compare their financial positions (AccountingTools, 2021). By taking this approach to uniformity and applying it to ESG-reporting, uniformity will thereby be the similarity in methods of reporting and the presentation of the results.

[3] U. S. Securities and Exchange Commission (SEC). The Place where American companies file their financial information to make it public for investors and other stakeholders (U.S. Securitites and Exchange Comission , 2022). Similar as the Norwegian Brønnøysundregistrene.

A study done by Stubbs et al. (2012), which examined ESG-rating providers in Australia, found that a lack of uniformity in ESG-ratings compromises stakeholders' ability to compare and discriminate ratings (Stubbs & Rogers, 2012, p. 634). Uniformity in ESG-reporting has the big issue of businesses being different in nature, making it challenging to make a uniform solution. It is enhanced because different metrics have different weightings in companies and lack a solid and common value, like money in financial reporting. The study finds that uniformity can discourage innovation and investments toward satisfying stakeholders' requirements for ESG-ratings (Stubbs & Rogers, 2012, p. 634). Moreover, the rating agencies argue that they require the flexibility of no uniformity to meet reporting demands and point out that "one size fits all" will not meet the requirements. The study further argues that some uniformity will be needed to make companies more comparable. However, to combat the issue of uniformity, Stubs et al. argue that complete transparency of the rating methods could be introduced (Stubbs & Rogers, 2012, p. 635).

Transparency regarding ESG-reporting is how transparent reporting companies are towards the stakeholders about what data is used in the assessments, the assumptions one makes, how one has weighted different entities, and how one has calculated scores. The transparency will allow the stakeholder to see and assess the level of subjectivity of the report and then assess the level of bias in the methods (Stubbs & Rogers, 2012, p. 635). Rating agencies will argue that transparency will compromise their intellectual property to competitors and make their reporting methods somewhat copyable (Stubbs & Rogers, 2012, p. 635). Furthermore, this will make it harder for the agencies to secure clients, as there will be more agencies providing the same rating methods.

Stubbs et al. (2012) conclude that complete transparency of rating methods can help address the issues of uniformity and objectivity by giving the stakeholder the possibility to review the biases and subjectivity of the report. However, some form of uniformity is necessary. If complete transparency and uniformity are to be accomplished, policymakers must make a regulation, such as the taxonomy.

2.1.4 Regulations, framework, and reporting standards

2.1.4.1 Globally

There is a need for regulations and reporting standards to compare and measure companies' non-financial performance. For several years there have been attempts to establish regulations and standards, and this has been led by the five leading standard-setting organisations[4] (Drolet et al., 2021, p. 3). These standards have had the major task of covering over 600 reporting provisions globally, where many of them interpret sustainability differently (van de Wijs et al., 2020, p. 4). This makes it increasingly difficult for stakeholders to evaluate ESG performance.

[4] Carbon Disclosure Program (CDP), the Climate Disclosure Standards Board (CDSB), the Global Reporting Initiative (GRI), the International Integrated Reporting Council (IIRC), and the Sustainability Accounting Standards Board (SASB) (SDG Knowledge hub, 2020).

A report from the five standard-setting organisations addresses the issue of a complicated reporting atmosphere and lack of important regulations (Impact Management Project, World Economic Forum, Deloitte, 2020, pp. 2-3). Further, the report shows a possible solution to today's ESG situation and emphasises that such standards and regulations will structure the information and data needed to complete the reports. In addition, how the solution will enable tech solutions to be implemented both as reporting tools and into end-user technologies. In the last two years, there has been a growing momentum toward establishing a global sustainability-related reporting standard (Drolet et al., 2021, p. 15). The most significant development toward a global reporting standard is the launch of the International Financial Reporting Standards (IFRS) which introduced the International Sustainability Standards Board (ISSB) at COP26 last November (Drolet et al., 2021, p. 15). The ISSB, with the help of The Global Sustainability Standards Board (GSSB) and their GRI standard, have begun to coordinate their solutions and standard-setting activities (International Financial Reporting Standard, 2022). The ISSB and its partners have now drafted proposals and are seeking feedback by the end of July and will, by the end of the year, have issued new standards subjected to the feedback received (International Financial Reporting Standard, 2022).

2.1.4.2 EU

The EU, with the Non-Financial Reporting Directive (NFRD), implemented in 2007, already requires public listed companies with more than 500 employees to report on non-financial information (The European Commission, 2022). The requirements from the NFRD affect approximately 11 700 large companies in the EU. In April 2021, the European Commission adopted the Corporate Sustainability Reporting Directive (CSRD), which builds upon the NFRD and will take over the role of non-financial sustainability reporting. CSRD extends the scope to include all large, listed companies with detailed reporting requirements and standards. An audit is also required of all reported information (The European Commission, 2022). The CSRD is tailored to EU policies, and the drafts are developed by the European Financial Reporting Advisory Group (EFRAG). However, they are built upon and contribute to standardisation on an international level, such as the GRI standards, which again will merge with the standards under development by ISSB (GRI, 2021). This is done through a two- two-way companionship where the GRI-standardisation group takes representatives into their processes on a more global level. The first set of standards from the CSRD is to be adopted by October 2022.

Financial reporting standard groups draft both the CSRD and the ISSB standards due to the demand for a similar set of standardisations. As pointed out by the five big standardisationgroups: "We need to create an equivalent mindset when it comes to sustainability disclosure, so that actors coalesce around a set of generally accepted frameworks and standards that have global legitimacy through regulatory mandates or other recognition by policymakers and engage actively in the related ongoing standard-setting processes. Only then will the proliferation of alternative initiatives stop, companies' frustration be reduced, and quality and consistency of the reported information be improved" (Impact Management Project, World Economic Forum, Deloitte, 2020, p. 10).

Organisation	Description
The five main standard setting organizations:	These organizations have a tremendous influence on standard-setting. They have each role in the standard-setting and cover the standard-setting landscape. They also have strong business connections and significant credibility (SDG Knowledge hub, 2020).
International Financial Reporting Standards (IFRS)	A set of accounting rules for the financial statements of public companies intended to make them consistent, transparent, and easily comparable around the world. It mainly has jurisdictions in the EU and USA and is controlled by governmental instances (IFRS, 2022)
International Sustainability Standards Board (ISSB)	Established from the IFRS to develop drafts for reporting standards framework for sustainability. They focus on reporting standards on a global level and were introduced at the COP26 (IFRS, 2022).
26th UN Climate Change Conference of the Parties (COP26)	A conference hosted in Glasgow in November 2021 to accelerate actions toward meeting the demands of the Paris Agreement (United Nations, 2022).
Global Sustainability Standards Board (GSSB)	A non-governmental standards board is driven by different people from different business backgrounds. Have made the GRI standard that many companies use as guidance for sustainability reporting. Works with the ISSB to make a joint and global sustainability standard (GRI, 2022).
Global Reporting Initiative (GRI)	Independent, international organization helping businesses and other organizations take responsibility for their impacts. Provides the world's most widely used standards for sustainability reporting – The GRI Standards (GRI, 2022)
Non-financial Reporting Directive (NFRD)	Lays down the rules on disclosure of non-financial and diversity information by certain large companies. It has been decided to discontinue NFRD and give the CSRD the responsibility. (The European Commission, 2022)
Corporate Sustainability Reporting Directive (CSRD)	New reporting Directive to take over from the NFRD. Extends the scope of the NFRD, requires audited, more detailed requirements, and more digital tagged disclosed information. Developed by the EFRAG (The European Commission, 2022).
European Financial Reporting Advisory Group (EFRAG)	Private Association with the encouragement of the European Commission to serve the public interest. They have an important perspective of EU rules and regulations to make the new sustainability standards for the CSRD. Have strong knowledge about the GRI (EFRAG, 2022).

Table 1: Overview of organisations that affects the work on regulatory standards and frameworks

2.1.4.3 Norway

Norwegian companies must follow two legislations that require companies to report on sustainability. The first one is "Regnskapsloven § 3-3 c Redgjørelse av samfunnsansvar" (The accounting law § 3-3 c statement of social responsibility). The law affects all publicly traded companies. It states that everyone must account for human rights, labour rights and social conditions, external environment effects, and anti-corruption activities (Regnskapsloven, 1998, § 3-3c). The law does not have any requirements on how the report should be developed and presented, and it does not give concrete requirements on exactly what type of information that needs to be disclosed in the report. However, all companies must report on instances of sustainability even though they may not be relevant for each company (Regnskapsloven, 1998, ss. § 3-3c).

The other legislation is "Likestillingsloven § 26 Arbeidsgivers aktivitetsplikt" (Equality and Anti-discrimination Act § 26 Activity duty for employers). The legislation affects all companies in Norway and requires them, in different degrees based on the number of employees, to map out, document, and report different metrics and the work done to promote equality (Likestillingsloven, 2018, §26). These metrics, unlike the ones coming from Regnskapsloven § 3-3 c, have more regulation and standards on how it should be completed and therefore promotes automatisation through IS software (Glosimot, 2021)

The legislation in Regnskapsloven § 3-3 c results from the Storting in Stortingsmeldingen 10 2008-2009[5] wanting to increase the awareness of social responsibility for both governmental and private organisations (Utenriksdepartementet, 2009). In a report from Finansdepartementet (the Norwegian Department of Finance) on reporting requirements for social responsibility, it is pointed out that there is no need for detailed requirements in the report. This is due to the nature of the difference between companies per date. However, some regulations and standards should be developed eventually (Høring - Rapport fra arbeidsgruppen for CSR-rapportering, 2010). The report shows that the legislation focuses on reporting the Company Social Responsibility (CSR) and not ESG-reporting. The difference here is that CSR is more of a business model and gives context to sustainability agendas and targets, while ESG is the defined action and how sustainable the outcome of activities is. CSR is the qualitative side, and ESG is the quantitative side (Chu, 2021). This makes ESG-rapports better to compare sustainable activities between companies due to the quantitative comparability.
Even though Norway has been at the forefront of enforcing declarations of non-financial activities, they still have the same core problems as everyone else. Jan Arild Brandt (2021), on Norwegian sustainability reporting, states that Norwegian companies' rating methods vary due to the lack of industry standards. Further, he states that the use of different data sources, low uniformity between reports, and weightings on different topics result from these varying methods (Brandt, 2021, p. 142).

To help companies and stakeholders with the sustainability reports and identify sustainable investments, Finanstilsynet (The Financial Supervisory Authority of Norway) has come up with a bill which will implement EU-receivables about sustainable finance into Norwegian law (Brandt, 2021, pp. 143-144). The bill is called "Lov om

[5] A Report to the Norwegian Parliament regarding Corporate social responsibility in a global economy.

offentliggjøring av bærekraftsinformasjon I finanssektoren og et rammeværk for bærekraftige investeringer" (Act on the publication of sustainability information in the financial sector and a framework for sustainable investments) and it includes two regulations.

The first one is the "Offentliggjøringsforordningen" (The Publication Regulation). It demands publication of how companies contribute to sustainable development and regulations on disclosing information about sustainable activities and results for financial products (Brandt, 2021, p. 144). The second regulation is the "Klassifiseringsforordningen" (The Classification Regulation), and it determines criteria on how sustainable business activities can reduce the risk of greenwashing (Brandt, 2021, p. 144). This will follow the legislations proposed and implemented by the EU Commission due to the European Economic Area (EEA). "Offentliggjøringsforordningen" will follow the EU's CSRDs take on the reporting of ESG-assessments, while "Klassifiseringsordningen" will follow the newly adapted EU Taxonomy.

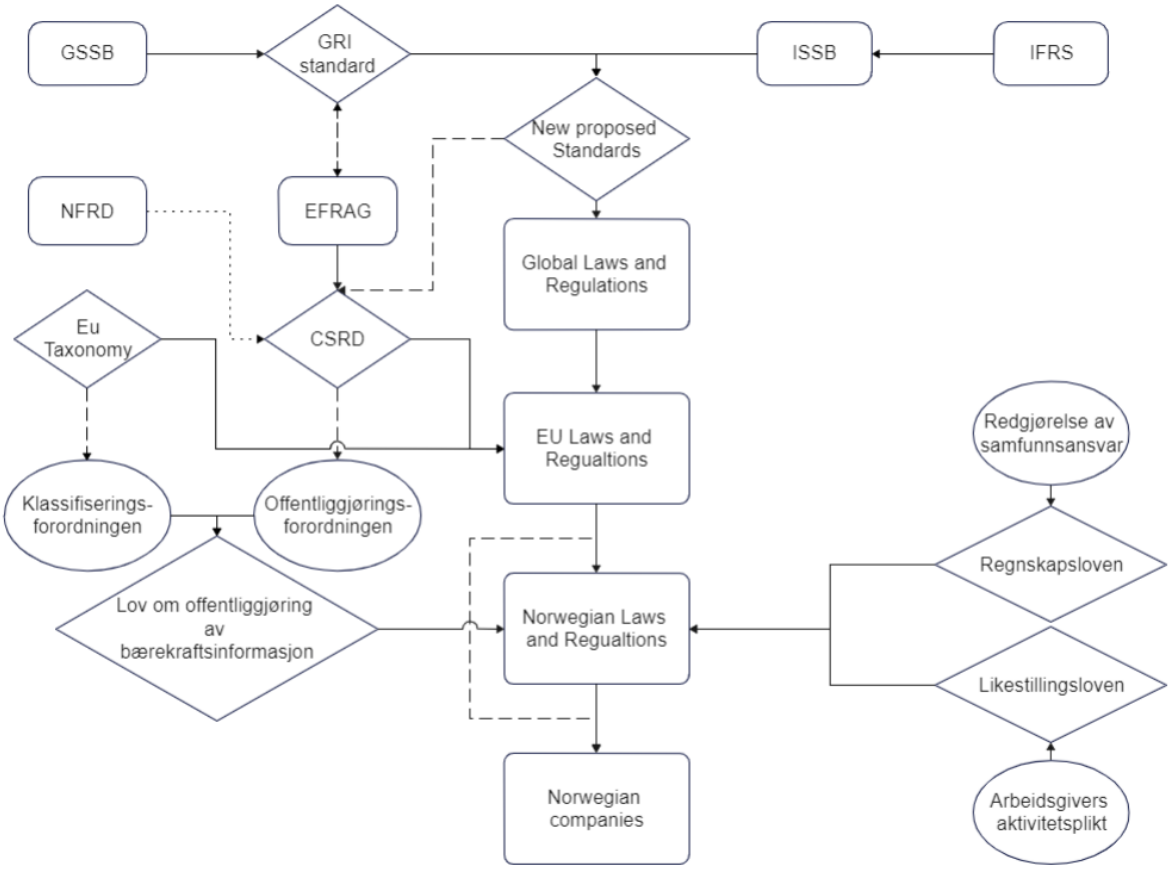

Figure 1: The figure shows how all the different laws and regulations affecting Norwegian companies. Squares symbolises sets of laws and regulations. Rounded squares are organisations that affects these sets. Diamonds are laws that are or will be implemented, and Circles are specific parts of these laws. Solid arrow means "directly affected by", dashed thick arrow means "indirectly affected by" and dotted arrow means "taken over by".

2.2 Usage of ESG information

A report from Amel-Zadeh and Serafeim (2018), Why and How Investors Use ESG Information: Evidence from a Global Survey, states that the number of companies

issuing sustainability or integrated reports with ESG data has increased from fewer than 20 companies in the 1990s to nearly 9,000 by 2016 (Amel-Zadeh & Serafeim, 2018, p. 87) Moreover, recent studies used as a basis for the report state that "ESG disclosures are associated with lower capital constraints, lower costs of capital and stock price movements around mandatory ESG disclosure regulations". Further, Amel-Zadeh and Serafeim made several interesting findings. On whether investors consider ESG information when making investment decisions and why, 82.1 % of those asked answered "yes" (Amel-Zadeh & Serafeim, 2018, p. 91). Out of these, 63.1 % said yes because they found "ESG information material to investment performance". The second-largest response group (33.1%) responded that they considered ESG information in investments decisions "because of growing client/stakeholder demand".

Another interesting finding in this study is barriers to ESG data use in the investment decision process. Here, Amel-Zadeh and Serafeim found out that one of the most significant barriers to using ESG information was "the lack of cross-company comparability" (44.8%) and "the lack of standards in reporting ESG information" (43.2%) (Amel-Zadeh & Serafeim, 2018, p. 93). Moreover, 40.5 % of the surveyed investors responded that the cost of gathering and analyzing ESG information was a great barrier.

2.3 The EU Taxonomy

"The EU Taxonomy is a classification system, establishing a list of environmentally sustainable economic activities" (European Comission, 2022). The taxonomy's goal is to provide investors, companies, and policymakers with definitions for economic activities that can be considered sustainable and by that prevent companies from greenwashing. For an economic activity to be recognised as green or environmentally sustainable, the activity must substantially contribute to at least one of the EU's climate and environmental objectives (The European Commission, 2021).
The Taxonomy comes from the European Union policy initiative "The Green Deal", which includes several environmental targets. One of them is a climate-neutral Europe by 2050 (The European Commission, 2019). To achieve this goal, the EU created the Taxonomy to measure ten activity points in three categories. The three categories are 1. Redirecting capital flow towards sustainable activities, 2. Sustainability to be a part of investment risk assessment, and 3. Sustainability to be included in the company reporting (The European Commission, 2021). This is the essential task of the Taxonomy.

The Taxonomy affects the most relevant sectors for achieving climate neutrality and a sustainable future (The European Commission, 2021). This means that companies with activities that cannot achieve climate neutrality are not a part of the Taxonomy, like oil production and coal power plants (The European Commission, 2021). When a business activity fulfils the criteria listed in the taxonomy, the activity is then considered "taxonomy aligned".

Unlike ESG-reporting, the reporting on Taxonomy alignment is mandatory for some companies in the EU (The European Commission, 2021). These are large financial and non-financial companies that have more than 250 employees with a balance sheet of more than 43 million euros. In other words, all companies that are not small-medium enterprises (SMEs) (The European Commission, 2021). Taxonomy reporting is also

mandatory for all companies listed on the stock exchange. SMEs that are not listed on the stock exchange can report on a voluntary basis but may have to report if they have investment funds invested in their company. Investment funds must report on Taxonomy through their portfolio, which means that the companies in the portfolio also must do it (The European Commission, 2021). The EU Taxonomy reporting became mandatory for taxonomy aligned companies in the EU 1. January 2022, and will be mandatory in Norway by 1. January 2023, through "Klargjøringsforordningen" (The European Commission, 2021).

2.4 SaaS – Software as a service

"Software-as-a-Service (SaaS) is a model of software deployment where applications built specifically for network delivery are hosted, provisioned, and accessed by users over the internet" (JU et al., 2010, p. 384). SaaS is software that does not need to be downloaded onto customers' systems but is accessed through existing software such as web browsers. The pricing method is usually an "everything included model" where a monthly fee covers all expenses with the service (JU et al., 2010, p. 385).

With its pricing model, architecture, and design, SaaS has several advantages over standard software, especially for smaller businesses (JU et al., 2010, p. 385). JU et al. (2010) comes up with ten main benefits to SaaS, where the most significant benefit is that it is easy to implement, has a low cost to begin operation, and there is no need for the software to be downloaded.

As earlier mentioned, Celsia provides Taxonomy calculation software and is a SaaS by providing a dashboard solution hosted in the browser that customers can access through a monthly subscription. The Taxonomy framework makes it possible for Celsia to develop such software since the framework has strict guidelines on what data and metrics to use (The European Commission, 2021).

SaaS has limitations, such as a lack of customization and real-time data exchange (JU et al., 2010, p. 387). The taxonomy framework avoids the limitations with its strict guidelines that interpret what type of data to include and how to execute the calculations and present them. This means that SaaS is a good fit for reporting on the Taxonomy.

2.5 Technology acceptance model

The technology acceptance model (TAM) is a model developed by Fred Davis to predict and explain user behaviour towards technology (Davis Jr, 1985, s. 2). Davis' (1985) TAM model suggested that the motivation for using technology can be explained through three factors: the perceived ease of use, perceived usefulness, and attitude towards using. This approach builds upon the conceptual framework where the features and capabilities of the system affect the user's motivation to use the system, which results in the actual system use. Davis hypothesised that the attitude toward using a system is the primary determinant of the actual use of a system or rejection of the system (Davis Jr, 1985, s. 24). This attitude affects perceived usefulness and perceived ease of use. Perceived usefulness is defined as "the degree to which one believes that using a particular system would enhance the job performance" (Davis Jr, 1985, s. 26). Perceived ease of use is defined as "the degree to which an individual believes that using a particular system would enhance the job performance" (Davis Jr, 1985, s. 26). Davis

(1985) reflects that perceived ease of use has a casual effect on perceived usefulness due to the usefulness being affected by how easy the system is to use.

Perceived usefulness and ease of use are both directly influenced by system design characteristics and external variables. These variables are, for example, system features, system readiness, already existing systems, and the general idea of it-readiness in the company (Davis Jr, 1985, s. 67). These variables can also be from outside the company, such as regulations, economic factors and competition.

Davis et al (1989) further worked on TAM and found out through research that attitude towards using does not directly affect the actual system use but rather directly affects the behavioural intention to use (Davis et al., 1989, s. 985). This behavioural intention is also directly affected by the perceived usefulness. Arguably, even though the system is low in ease of use and has a negative effect on the attitude towards use, the user may still have a strong intention to use it due to the usefulness of the system.

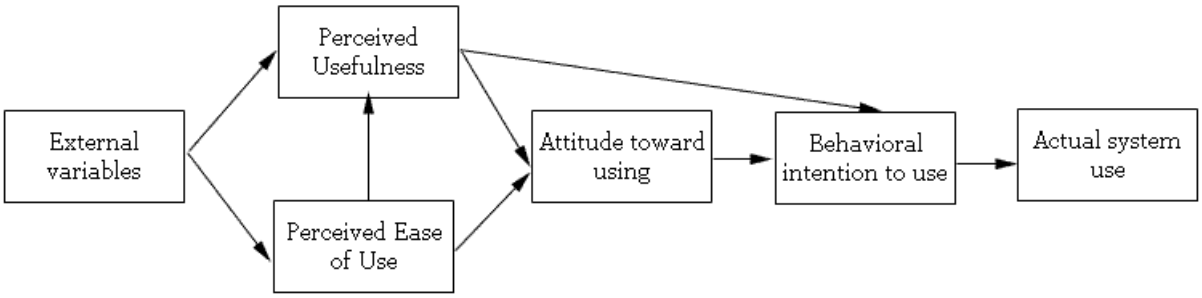

Figure 2: Technology Acceptance Model (TAM)

2.6 Realization of Business Benefits from IS/IT-investments

"A benefit is a measurable improvement resulting from an outcome perceived as an advantage by one or more stakeholders" (University of Tasmania, 2022). To realise the benefits, companies can go through the process of benefits realisation. This process is where one identifies, executes and measures benefits (University of Tasmania, 2022). In implementation projects regarding specialised software that enables ESG-assessments, a benefit realisation process would ensure that predetermined benefits are realised from the implementation project (University of Tasmania, 2022).

known approach to the evaluation and realisation of IS/IT benefits is called IS/IT benefits management and is defined as "The Process of organising and managing such that potential benefits arising from the use of IT are actually realised" (Ward et al., 1996, s. 214). They further state that the benefit management approach implies that measures of success, as in these conditions will be the realisation of benefits, are developed pre-project to be used post-project review. To take advantage of the benefit opportunities, Ward et al. (1996) says that there must be a change in how business activities are performed or how information is used. With this approach, benefits may be considered an effect of the change in the work processes.

Peppard et al. (2007) points out through their research that IT has a poor reputation due to several reasons. However, a common one is that IT is viewed as failing to deliver "value for money" (Peppard et al., 2007, s. 2). "Value for money" is defined by the British Department of Finance as "the most advantageous combination of cost, quality, and sustainability to meet customer requirements" (Department of Finance, 2022). The

poor reputation derives from assuming that the price of the IT product does not reflect the value it gives the company. In other words, it does not realise the benefits anticipated.

Peppard et al. (2007) came up with five principles for realising benefits through IS/IT through their analysis. The first principle states that *IS/IT has no inherent value*. Technology in itself does not give any benefit or create value. A company does not possess values and benefits from IS/IT, such as other assets like real estate. However, values and benefits result from the effective use of the IS/IT assets. This principle emphasises the importance of benefit realisation. The second principle is that *benefits arise when IT enables people to do things differently*. Benefits will only come if stakeholders in the organisation perform their work more effectively. IS/IT can enable businesses to redesign their processes and practices to enable and gain benefits. Third, *only business managers and users can realise business benefits*. Since benefits are the outcome of change and innovation through work processes, only managers and users of the system can make these changes and realise these benefits. This means that IS/IT-project staff are not accountable for realising the benefits. It is the responsibility of the business staff, more precisely, the users. The fourth states that *all IS/IT projects have outcomes, but not all outcomes are benefits*. IS/IT projects always have an outcome, but it is not always positive. The management has the challenge of avoiding these negative outcomes and making sure that the positive outcomes deliver explicit business benefits. Finally, *benefits must be actively managed to be obtained*. Benefits do not automatically occur, and the arrival of benefits lags implementation; it can, at times, be a gap between the initial investment and the arrival of benefits. Because of this, benefit management is a continuous working approach that continues until the expected benefits have been achieved or else, they will not be realised.

Peppard et al. (2007) emphasise the importance of these principles by stating: "Any approach to realising benefits from IS/IT investments must address the five principles". As for how any business plans to implement IT systems, the significance of benefit realisation is immense, and it will always have to be considered in projects.

2.7 Shareholder theory

The Shareholder theory states that "The primary objective of management is to maximise shareholder value" (O'connel & Ward, 2020, s. 2). The objective of the management at a company is, therefore, to always try to increase profits and stock value. Their focus is on the owners and their capital gain from the companies' activities. This focus ranks in front of employees, suppliers, customers, and society due to their ownership. The decisions made by the management should then make decisions based on what can increase share prices.

There is a fundamental problem with a company having their focus on the shareholder. When a company solely focuses on maximising profit, it may lead to a short-term focus with a considerable lack of long-term focus on development (Zhang, 2011, p. 91). Furthermore, according to Zhang (2011), this will have consequences for the company and its effect on society.

2.8 Stakeholder theory

The stakeholder theory states that "the task of executives is to create as much value as possible for stakeholders without resorting to trade-offs. Great companies endure because they manage to get stakeholder interests aligned in the same direction" (Freeman R. E., 1984). The main focus is still to maximise value for all stakeholders and not only shareholders (Freeman et al., 2010), and realise their common interests (Zhang, 2011).

Information technology and globalisation have made it possible and pressured companies to be more transparent about their activities, leading to an increased focus on maximising value for all stakeholders (Freeman et al., 2010). Zhang (2011) says that companies that pay attention to financial performance, stakeholders' interests and social responsibility are superior to other companies due to their more long-term focused goals that naturally occur with such a mindset. Because of this, investors have become more focused on companies' social, ethical, and environmental performances (Zhang, 2011). They use it as indicators of management quality and other business performance measures.

3 Method

Chapter 3 will explain the research method used in this study and further elaborate on why such a method has been chosen. The method will describe how the problem statement was chosen, the theoretical grounding of the study, the chosen research design, a description of the method for acquisition of data, and how the result was analysed. To finalise the chapter, the quality and weaknesses of the method will be discussed.

3.1 Choosing our problem statement

We collaborated with our supervisor Marthe Holum and our partner company Celsia, represented by Anders Habostad, in the process of choosing and formulating the problem statement of the thesis. Initially, there were several problem statements under consideration. While it was important to formulate a statement that could create real business value for Celsia, we also needed to identify a field of study where we could apply the knowledge we had acquired during previous terms of our bachelor's degree. Since Celsia is a company in the start-up phase, we were informed that there had been limited resources allocated to market research. Although they had been researching competitors, there was a gap in the research on customers, more specifically the demands of existing and potential customers in the Norwegian market for ESG software. The result of this was the following problem statement.

"What are the present and future demands for specialized ESG software among Norwegian companies, and how can Celsia utilize this information to expand/advance their services?"

3.2 Theoretical grounding

Our thesis is conducted with a deductive, positivistic approach. A deductive approach implies that the researcher takes existing theories and utilizes these to make hypotheses. Then, the hypotheses are attempted to be confirmed or denied. The researcher thereby goes "from theory to empiricism" (Johannessen et al., 2016, p. 47). Positivism is a quantitative approach defined generally as any "system that confines itself to the data of experience and excludes a priori or metaphysical speculations". Within positivism, one assumes that "scientific methods make it possible to uncover an objective reality" (Busch, 2013, pp. 50-52).

3.3 Research design

We chose case design as the research design for our thesis. The case design is a process that involves formulating a problem statement, selection of theoretical grounding, units of analysis and data collection techniques, as well as criteria to analyse and interpret data (Johannessen et al., 2016, p. 203). When conducting a study following a case design, one can choose four different strategies depending on the case. Johannesen et al. (2016) describe these four strategies using two different dimensions. The first dimension describes whether we work with one or more cases – "single case design" or "multiple cases design". In a single case design, the objective is to study one single case. In a multiple-case design, there can be several cases researched. Here, the purpose might be to either control the main case with other cases or investigate differences and similarities. The other dimension describes the selected research theme and whether there are one or several units of analysis. In our study, we applied a case

design with one single case and one unit of analysis. We conducted a single case study where we studied Celsia's opportunities to expand its services based on empirical data on practices and attitudes among Norwegian companies. Here, Celsia has been our unit of analysis, while the companies have been our data collection unit.

3.4 Method of data acquisition

We chose to acquire the quantitative data for our study through a survey. This approach can be defined as an extensive design, which means collecting data from many different sources. The opposite of an extensive design is an intensive design where the researchers try to get more in-depth through fewer sources, for example, through interviews (Busch, 2013, pp. 52-53). One can also argue that we are using a combination of extensive and intensive design. Because we are using a survey to collect data from multiple Norwegian companies, we can argue that this is an extensive approach. However, as described in the previous section, Celsia is our one unit of analysis, which implies a more intensive design. Nevertheless, we will in this section focus on how we have worked with our survey, as this is our source of empirical data.

In a survey, data are collected in a standardized form, from a large sample of respondents, in a pre-determined population (Kelly et al., 2003, p. 1). We chose to use a survey because of its ability to produce a large amount of data in a short period of time. As the bachelor project stretched over five months, this fit our project well. Another important factor in choosing a survey as our tool for data collection was the nature of our thesis. Since we were doing market research for Celsia, we had to cover a wide range of industries. The survey helped us do this in an efficient and resource-saving way. Before we distributed the survey to the respondents, it was revised multiple times with the help of both our supervisor and Celsia. In addition, we tested it on people with competence within the field of ESG and sustainability in general, ensuring that the survey was logical and understandable for the respondents. We also decided the survey to be anonymous, so that information collected would comply with privacy regulations. We utilized Nettskjema.no, a tool from Universitet i Oslo (UiO), to structure and build the survey. It was recommended by NTNU, partly due to an agreement on data processing, which made it stand out as a safe choice (NTNU, 2022).

3.4.1 Selection Strategy

Strategic selection of respondents is the decision of the target group for the study to acquire the necessary data. We soon found out that our desired target group would be Norwegian companies listed on the Norwegian Stock Exchange (OSE). OSE is divided into three capital markets. Euronext (large established companies, EU regulated), Euronext Growth (small and mid-cap growth companies), and Euronext Expand (mature companies of a certain size, yet not of a size that would satisfy a listing on the main list) (AksjeNorge, 2022). Although Euronext and Euronext Expand are the most regulated markets, we found it valuable also to include Euronext Growth in our target group since the EU is currently revising which companies to include in the EU Taxonomy. Furthermore, other new regulations are expected to be introduced that may also include companies of a smaller size.

After we had scoped out our target group, we had to decide which people we would address with the survey. We decided to use an intensive selection, which means that the selection consists of people with a particular characteristic (Johannessen et al., 2016, p.

115). In this case, someone in the organisation with competence in sustainability reporting. The natural choice was to address a Sustainability Officer or people in similar roles. If the company did not have a dedicated sustainability role, we tried to reach out to people with reporting responsibilities, such as Chief Financial Officer (CFO) or others in finance, or employees in legal divisions.

The distribution of the survey had two main challenges. We had to find the contact information of the people we were going to address, and we had to distribute the survey in a way that made sure the inquiries were not overlooked. Neither of the challenges had an efficient solution. Therefore, we spent several days collecting and systemising the contact information of the respondents. Then, we sent individual standardised emails to each of the recipients. By doing it in this way, we could, to some extent, track which organisations had answered our survey. We could then decide which companies to send a follow-up mail to, reminding them to take our survey. The mail contained information about the project and the survey itself, a link to the survey, and contact information so that we could answer potential questions. This was a long-lasting process. However, in the end, we had addressed 342 companies from Euronext, Euronext Growth and Euronext Expand.

3.4.3 Selection of variables

The structure of the survey was of great importance. A well-structured survey should excite the respondents' interest to continue and give a systematic and thoughtful impression of the questionary (Johannessen et al., 2016, p. 273). Decisions were made on how to order the variables and how to group them into suitable categories. The finished survey contained five categories with variables: 'General', 'ESG Metrics', 'ESG Software', 'Motivations for ESG reporting', and 'The EU Taxonomy'.

3.4.3.1 General

The 'General' category includes questions about the industry the companies operate within and the number of employees. Knowing a company's industry of operation and approximate size in terms of employees can be valuable information to group and analyse the results.

3.4.3.2 ESG Metrics

The ESG Metrics category contained four questions, where the first three questions asked the respondents about which ESG metrics they were currently reporting on. As described in the theory about ESG, missing frameworks in ESG reporting is a considerable challenge in today's unregulated standards and practices of reporting. Therefore, our challenge was to identify, to some extent, a universal grouping system for ESG data with categories that were broad enough to fit each respondent's different data, however narrow enough to specify the data's character. Therefore, to group the data, we utilized the Nasdaq ESG Reporting Guide, which contained ten different ESG metrics for each of the three pillars of ESG (Nasdaq, 2019, p. 13). We chose the Nasdaq Guide over Euronext's own reporting guide because Nasdaq's guide was more detailed and comprehensive and had more metrics. Even though Nasdaq is another stock exchange, the lack of regulatory standards and frameworks makes it relevant to our thesis. In Table 2 below, the 30 different metrics are listed. In addition to these, the respondents could choose "Other" as an alternative. This activated a text box where they could fill in the metric they felt were missing.

Nasdaq ESG Reporting Guide – Metrics		
Environmental	**Social**	**Corporate Governance**
E1. GHG Emissions	S1. CEO Pay Ratio	G1. Board Diversity
E2. Emissions Intensity	S2. Gender Pay Ratio	G2. Board Independence
E3. Energy Usage	S3. Employee Turnover	G3. Incentivized Pay
E4. Energy Intensity	S4. Gender Diversity	G4. Collective Bargaining
E5. Energy Mix	S5. Temporary Worker Ratio	G5. Supplier Code of Conduct
E6. Water Usage	S6. None-discrimination	G6. Ethics and Anti-corruption
E7. Environmental operations	S7. Injury Rate	G7. Data Privacy
E8. Climate Oversight/Board	S8. Global Health and Safety	G8. Publishes Sustainability Report
E9. Climate Oversight / Management	S9. Child and Forced Labor	G9. Disclosure Practices
E10. Climate Risk Mitigation	S10. Human Rights	G10. External Assurance

Table 2: The metrics of Nasdaq's ESG Reporting Guide

The fourth question in this category asked what tools and solutions the companies used to report on the metrics they had selected in the three previous questions. They could choose between external consultants, in-house developed software or solutions, and external specialized software. External consultants refer to if the company hires a consultant to deal with their reporting responsibilities and In-house developed software or solutions to software, spreadsheets, or other solutions that have been developed internally in the organization. Specialized external software was intended to include solutions. such as Celsia's own EU Taxonomy Software or other reporting-specialized software.

3.4.3.3 ESG Software

The ESG Software category was the most comprehensive section of our survey. Our variables included: which metrics the companies utilized specialized ESG software to report on, how likely it was that the companies would need specialized software in the future, attributes of importance in specialized ESG software, attitude towards buying new software, within which price ranges they would be willing to buy software, and who would be the key owner of a specialized ESG software solution.

Using the Nasdaq Reporting Guide, the first three variables about which metrics the companies used specialized software to report on were structured similarly to the three first variables in the ESG Metrics category.

3.4.3.4 Motivations for ESG Reporting

This section asked the respondents to rank different statements from 0 to 10 according to how motivating they found them to be in relation to reporting on ESG metrics. The statements included values such as branding, compliance, investor relations, shareholders, customer demand, the link between financial and non-financial performance, decision-making, and risk management.

3.4.3.5 The EU Taxonomy

The last section of our survey revolves around the EU Taxonomy. It includes three questions; whether the respondents knew their company's taxonomy score, if they were planning to report on the taxonomy, and if they used specialized software to do so.

3.4.4 Operationalization of variables

The thesis is structured as a case study, utilising quantitative data to investigate the market of the selected case. Operationalisation of variables is the process of concretising general theoretical phenomena into processable data (Johannessen et al., 2016, p. 249). This was an important step in collecting the information needed to answer our problem statement. The most efficient measure to operationalise the variables was to limit the number of queries that needed a free text answer from the respondents. Through extensive research, we operationalised our variables and values to an adequate extent. We used radio buttons, checkboxes, and scales. Since our survey focused on practices and attitudes towards ESG reporting, scales were of substantial importance. Since scales allow the respondents to quantify feelings and attitudes (Svenson, 2001, p. 1), it was especially utilised in the category "Motivations for ESG reporting". The complete survey can be found in appendix 1.

3.5 Data analysis

We have performed a statistical analysis of the data collected through our survey by primarily using Excel and its Pivot-table functionality. A pivot table is an effective and interactive tool in Excel to summarise, analyse, explore, and present data (Microsoft, n.d.). Before we could start analysing the data, we had to export the data from Nettskjema.no to Excel. After the exportation, we cleaned the dataset and prepared it for analysis. The cleaning included changing many of the column names, as the default names generated by Nettskjema were unsuitable for further use. An important part of cleaning the dataset was also to adapt the cases where the respondents had given their answers in free text. Using the Pivot-table functionality in Excel, we avoided unnecessary work, such as manually creating different tables. Further, we have utilised various charts and diagrams to visualise our survey results suitably.

3.6 Quality of method

This chapter will discuss the quality of our chosen research method. Johannesen et al. (2016) utilize four terms when evaluating the quality of a research method – *Reliability, internal validity, external validity,* and *objectivity*.

3.6.1 Reliability

Reliability in quantitative research is about the accuracy of the collected data, the type of data included in the research, the method of acquisition, and how they are processed (Johannessen et al., 2016, p. 36). A suitable way to test data reliability on quantitative

data is to repeat a survey on the same group of respondents at two different times. For example, with a gap of 2 or 3 weeks. This is called *test-retest-reliability*. Another way to test data reliability is if several scientists research the same topic. If the results are the same, this indicates high data reliability. In our research we did not have the opportunity to do a *test-retest* because we found it unlikely that our respondents would agree to take our survey twice, nor did we see how this would strengthen our data reliability, as attitudes and practices towards ESG reporting is not something that changes over 3 weeks.

3.6.2 Internal validity

Intern validity is the extent to which a researcher's methods and findings correctly reflect the purpose of the study and represent reality (Johannessen et al., 2016, p. 230). Johannesen et al. (2016) further introduce two techniques to help produce valid scientific results. Continuous observation and method triangulation. Continuous observation involves investing enough time to get acquainted with the selected field of study. Due to the time scope of the bachelor thesis, our study lasted for approximately five months. As the market for specialized ESG software is relatively new, with the dominant growth expected to develop from 2020 to 2028 (Business Wire, 2022), one could argue that continuous observation over a more extended period would have given us additional input from this development. The input could have strengthened our thesis and the internal validity.

Method triangulation refers to combining different methods to acquire data (Johannessen et al., 2008, p. 228). In our case, a survey combined with interviews with some of the companies could have given additional insight and, in this way, strengthened the internal validity. We considered doing this for some time. However, we concluded that the degree of additional information accessible through interviews did not weigh up the additional time and effort needed to conduct several interviews.

3.6.3 External validity

The study's external validity is the findings and interpretations' degree of generality. Moreover, their usefulness and transferability to other fields of study (Johannessen et al., 2016, p. 231). For example, would it be interesting to see if our findings could be applied to other Scandinavian markets. As the Scandinavian culture, society and business have many similarities, this would be an interesting test of the external validity of the study.

3.6.4 Objectivity

Objectivity as a measure of quality is the degree to which the results from a qualitative study can be confirmed by other scientists in similar studies (Johannessen et al., 2016). To facilitate the objectivity of a thesis, it is important to be transparent about decisions made during the study. Throughout the study, we have been honest about how we have conducted the project, pointed out biases and deviations where these have occurred, and been open about existing prejudices and perceptions that may have affected our interpretation and approach to the project.

3.7 Limitations and Weaknesses of Method

3.7.1 Response rates

When conducting a survey, there is desirable to achieve the highest possible response rate. However, this is often challenging. A high response rate is classified as 80-90 % of the gross sample of respondents (Johannessen et al., 2016, p. 245). It is highly irregular to achieve such a response rate. 50 % is usually considered sufficient. With our survey, we managed to get a response rate of 14.62%, which is 50 respondents out of 342 asked. Although this must be considered relatively weak, several plausible reasons can explain it. Reluctance towards participation due to lack of resources may be a reason. Another cause may be that some companies find the survey topic irrelevant to them and therefore choose not to answer.

To compensate for the weak response rate, we considered combining an extensive and intensive design, for example, by conducting in-depth interviews with some of the companies. We discussed it with our supervisor, however, due to the project's scope and time limit, we instead decided to put effort into maximizing the response rate on the survey. Regardless, the variety of industries represented among our respondents can be argued to weigh up for a relatively weak response rate, allowing us to identify interesting trends and patterns.

3.7.2 Professional role of respondents

Another identified weakness of our method is the professional role of the respondents taking the survey. Initially, we wanted the respondents to primarily consist of typical sustainability roles, such as Head of Sustainability or Sustainability Directors. We considered that these people would have the knowledge needed to respond accurately to the survey. We soon experienced that not all companies operate with their own role responsible for sustainability. In these cases, we asked the companies for people with reporting responsibilities, such as people from finance or legal departments. Generally, many companies had a suitable person to answer the survey. However, there may be respondents where the degree of knowledge about ESG reporting in the company has not been at a desirable level.

3.7.3 Predefined answers

Since the survey respondent cannot freely express his or her thoughts and feelings around a subject, there will be a chance for misinterpretation of both the survey’s questions and question answers. To prevent this, we took our survey through multiple revisions. In addition, we made sure to be available for questions from all the participants over mail.

4 Results

In this chapter, we will present the survey result through visualizations, followed by a brief explanation of each result. The structure of this chapter is based upon the five categories introduced in 2.4.3 "Selection of variables".

4.1 General

The category general is included in the survey to acquire basic, however important, information about what kind of organization the respondent represents. The information from this part of the survey is regarded as important to classify and systematize the answers.

4.1.1 Industry

"In which group of industry does your business operate in?"

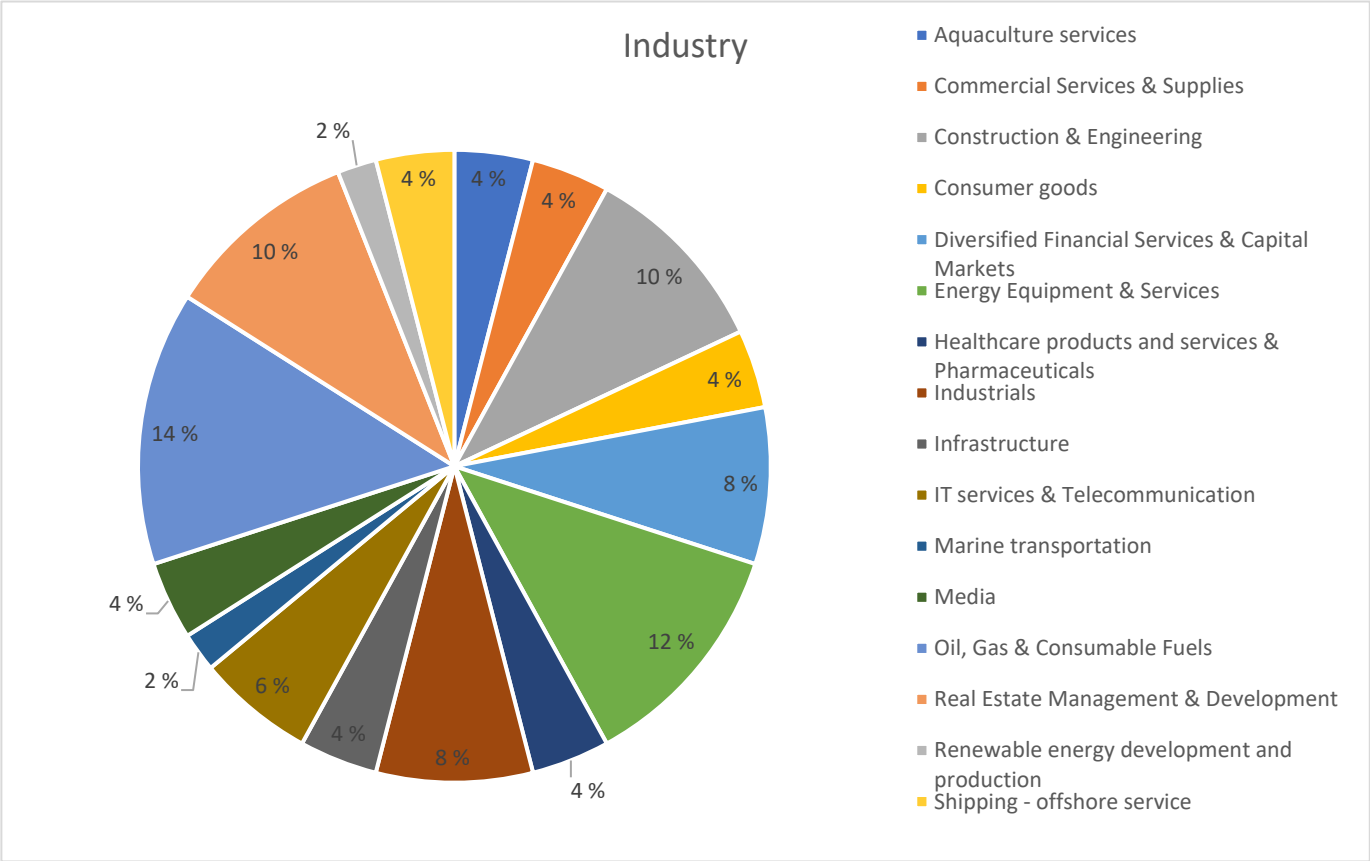

Figure 3: Respondents by industry

The figure shows the spread of industries between the companies that have answered the survey. The diagram shows that the survey is distributed relatively evenly throughout the various industries included in our selection. However, three industries stand out. "Oil, Gas, and Consumable Fuels" (n=7) with 14%, "Energy Equipment and Services" (n=6) with 12% of the respondents, and "Real Estate Management and Development" (n=5) where 10% of the respondents are working in this industry.

4.1.2 Number of employees

"What is the approximate number of employees in your company?"

In chapter 3, "Method", we have elaborated on our selection strategy regarding company size and how we chose to include smaller companies in our target group. The variety in the number of employees in the participating companies is visualized in a histogram. The bins stretch from <=10 to more than 5000. The two most dominating bins are >10 to 100 with 30% (n=15) of the companies within this range and 28% (n=14) within the range >1000 to 5000 employees. The company, with more than 5000 employees, had 30 000 employees.

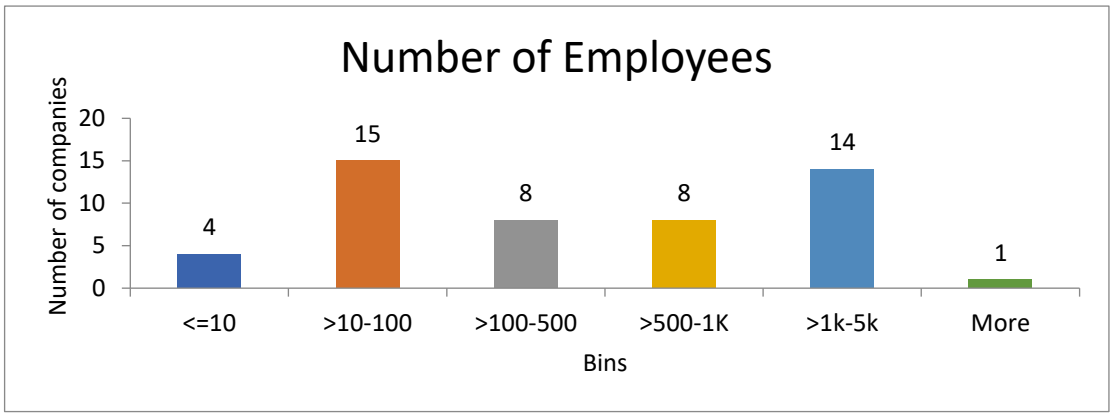

Figure 4: Size of companies based on number of employees

4.2 ESG Metrics

The ESG Metrics category is included in the survey to determine which metrics the companies report on within the three different pillars of ESG – Environmental, Social, and Governance. The different metrics have been taken from Nasdaqs' ESG reporting guide to provide clarity and direction to the respondents, as the guide clearly settles what the different metrics include.

4.2.1 The Environmental Pillar

"On which metrics within the Environmental pillar does your business report?"

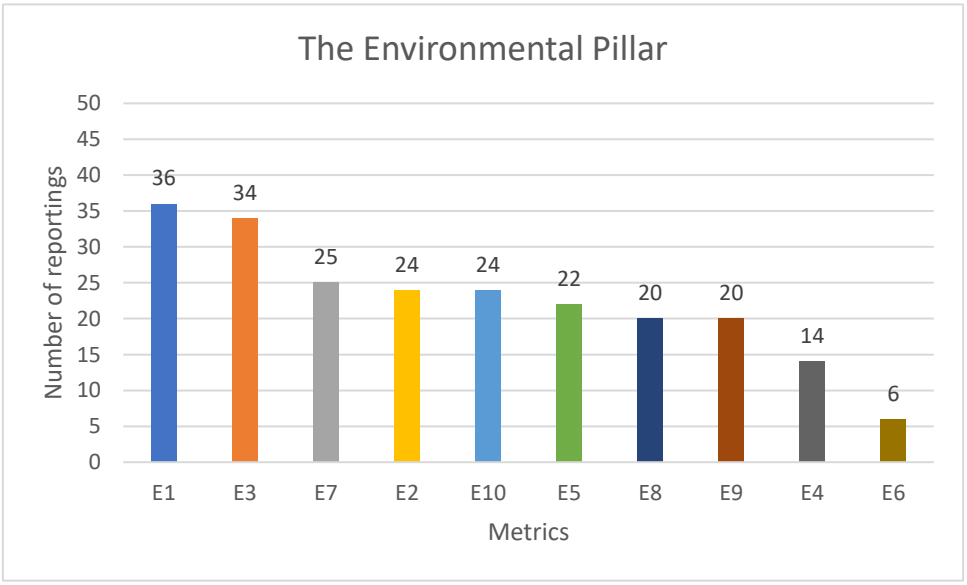

Figure 5: Reporting on environmental metrics

Here, we can see that the metric most reported on within the Environmental pillar is *E1. GHG Emission*. GHG, short for Greenhouse Gas emissions, is measured by "tracking the actual or estimated atmospheric emissions produced as a direct (or indirect) result of the company's consumption of energy" (Nasdaq, 2019, p. 14). Out of 50 respondents, 72% (n=36) of these reported on GHG emissions. The metric with the lowest registered reporting coverage *is E4. Energy Intensity*, with 28% (n=14) of the respondents reporting on this metric. This refers to the "total direct energy usage per output scaling factor" (Nasdaq, 2019, p. 15).

4.2.2 The Social Pillar

"On which metrics within the Social pillar does your business report?"

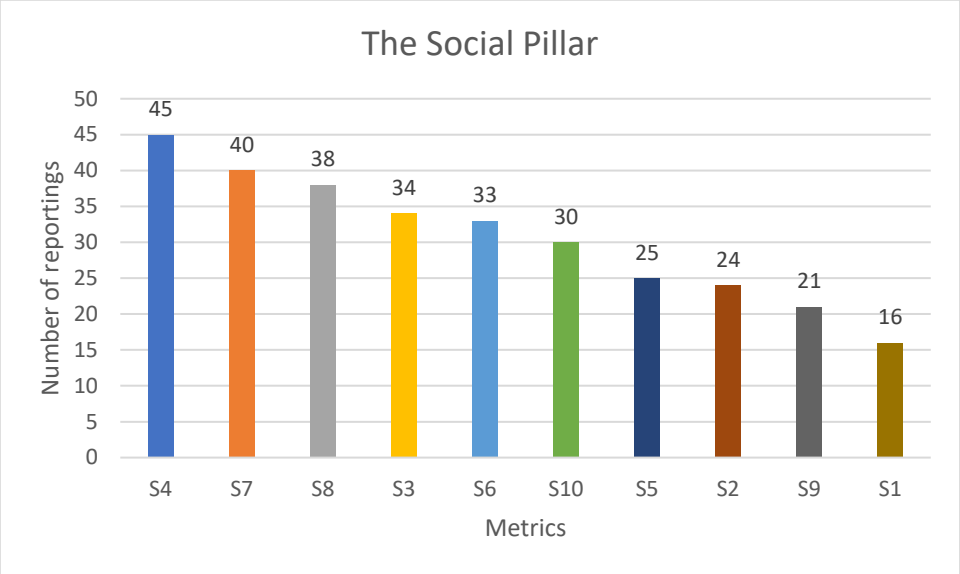

Figure 6: Reporting on social metrics

Within the social pillar of ESG, the most reported metric is *S4. Gender Diversity*, with 90% (n=45) of the respondents reporting on this metric. The metric with the lowest rate within the Social pillar is *S1. CEO Pay Ratio*, with 32% (n=16) of the companies answering that they report on this metric. CEO Pay Ratio is measured to illuminate a company's costs for its CEO role compared to other employees (Nasdaq, 2019, p. 19).

4.2.3 The Corporate Governance pillar

"On which metrics within the Corporate Governance pillar does your business report?"

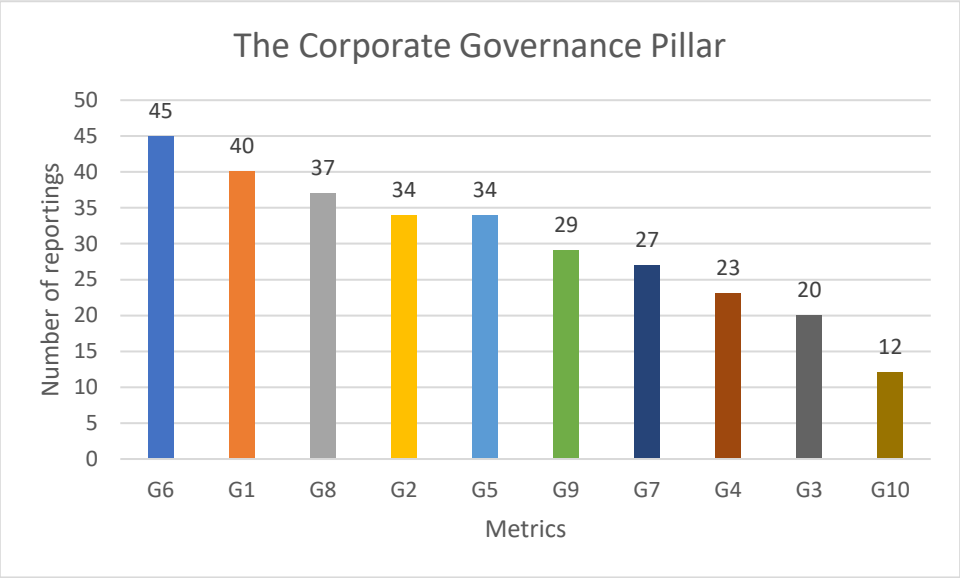

Figure 7: Reporting on governance metrics

The most reported Governance metric among the respondents is *G6. Ethics and Anti-corruption*. On this metric, 90% (n=45) of the companies report. *G10. External Assurance* is the least reported metric within the Corporate Governance pillar, with a response rate of 24% (n=12).

4.2.4 How do the companies report?

"What tools or solutions do you use to report?"

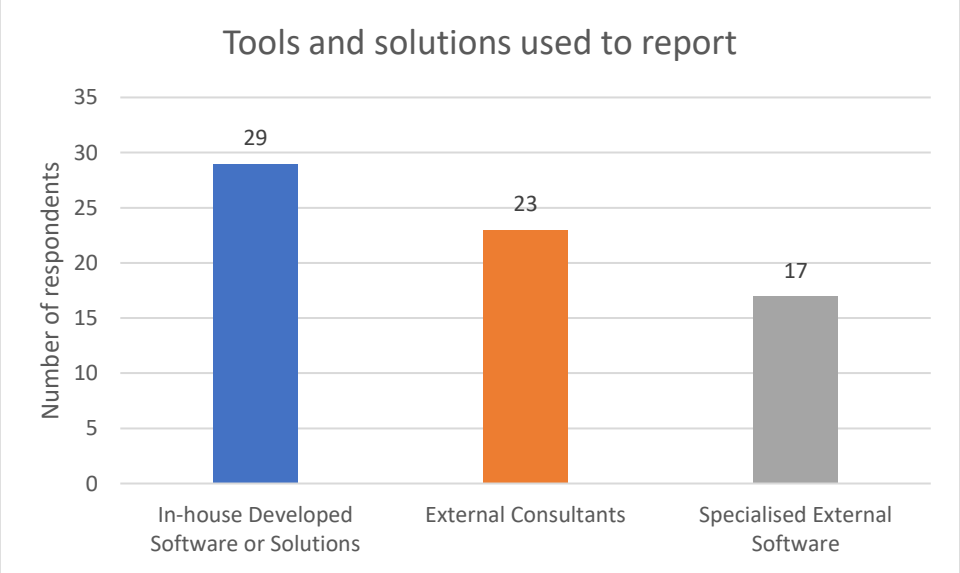

Figure 8: Tools and solutions used to report

Here, we can see that 34% (n=17) of the companies report through specialized external software. 58% (n=29) of the respondents have answered that their company utilizes an

in-house developed solution, while 46% (n=23) answered that they are using external consultants to assist with the reporting of ESG metrics.

4.3 ESG Software

This section asked the respondents about their current solution for ESG reporting and their future demand regarding ESG Software. The previous sections, 4.2.1-4.2.3 and the following sections, 4.3.1-4.3.3, are quite similar. We, therefore, find it necessary to emphasize their difference. Sections 4.2.1-4.2.3 ask which metrics the respondents are reporting on, regardless of any solutions or software they might be using for this. However, in sections 4.3.1-4.3.3, we only request the metrics where the companies use dedicated, specialized software to report. Hence, there is expected a deviation from the earlier sections.

4.3.1 The Environmental Pillar

"On which metrics within the Environmental pillar does your business use specialized ESG software to report on?"

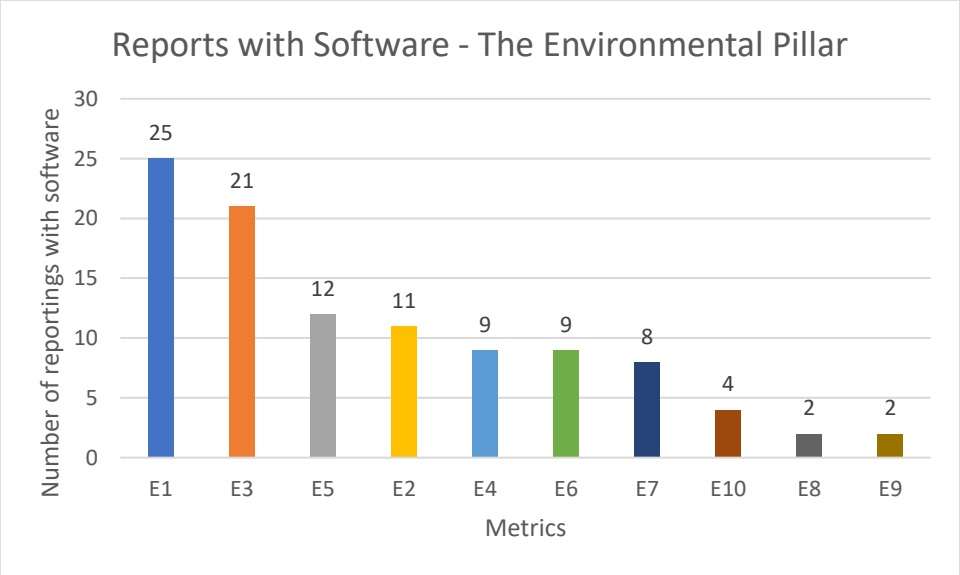

Figure 9: Reporting on environmental metrics with specialised software

Within the environmental pillar, we can see that 50% (n=25) of the respondents informed that they utilize specialized ESG software to report on *E1. GHG emissions*. 42% (n=21) of the respondents use specialized software to report on *E3. Energy Usage*. Among the metrics with the lowest response rate, we find *E8. Climate Oversight/Board* and *E9. Climate Oversight/Management* with 4% (n=2) respondents saying they use specialized software to report on each.

4.3.2 The Social Pillar

"On which metrics within the Social pillar does your business use specialized ESG software to report on?"

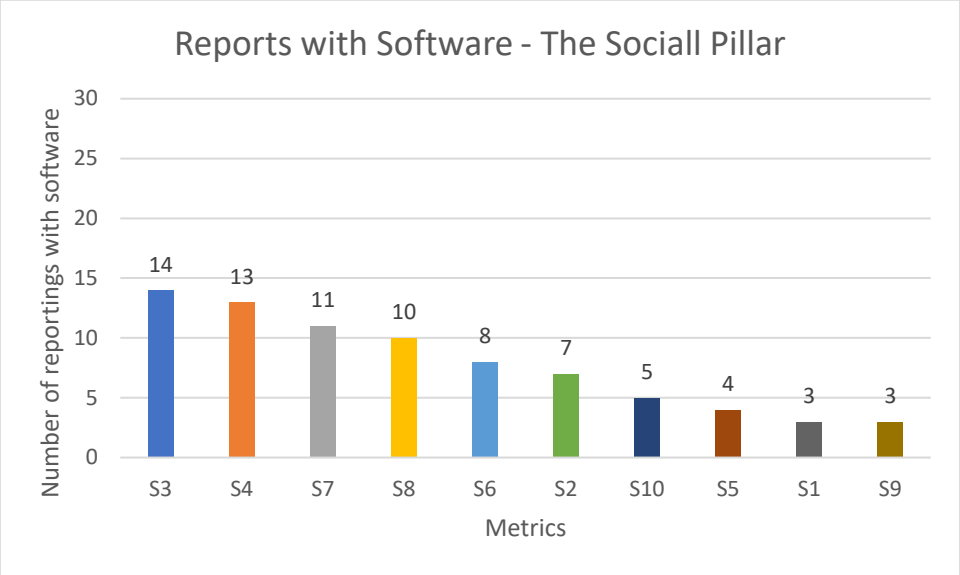

Figure 10: Reporting on social metrics with specialised software

We can see a considerably lower average response rate within the social pillar regarding specialized ESG software compared with the environmental pillar. The two metrics with the highest usage of specialized software is *S3. Employee Turnover* with 28% (n=14) of the respondents and *E4. Gender Diversity* with 26% (n=13) of the respondents. Among the metrics with the lowest response rate, we find *S1. CEO Pay Ratio*, *S5. Temporary Worker Ratio*, and *S9. Child and Forced Labour*. These metrics have 6% (n=3), 8% (n=4), and 6% (n=3) of the respondents answering that they use specialized software to report.

4.3.3 The Corporate Governance Pillar

"On which metrics within the Corporate Governance pillar does your business use specialized ESG software to report on?"

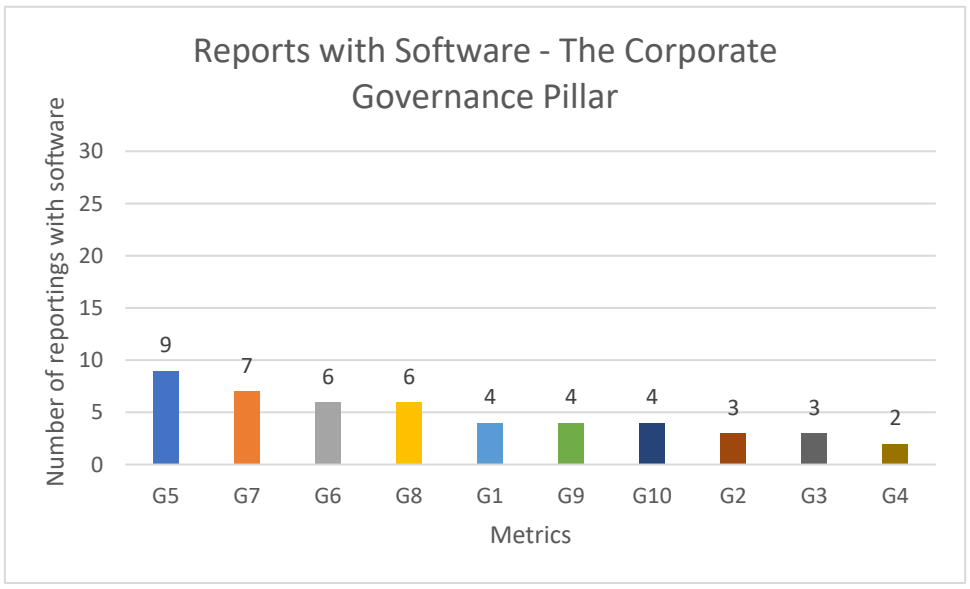

Figure 11: Reporting on governance metrics with specialised software

The last pillar, Corporate Governance, has the lowest overall response rate in the use of specialized software among the three pillars of ESG. Here, the highest reported use is on metric *G5. Supplier Code of Conduct* with 18% (n=9) of the respondents using specialized software to report this metric. The lowest reported use is on metric *G4. Collective Bargaining* with 4% (n=2) of the respondents.

4.3.4 Need for Specialized Software in The Near Future

"How likely is it that your business will need new or additional specialized software to report on ESG data in the near future?"

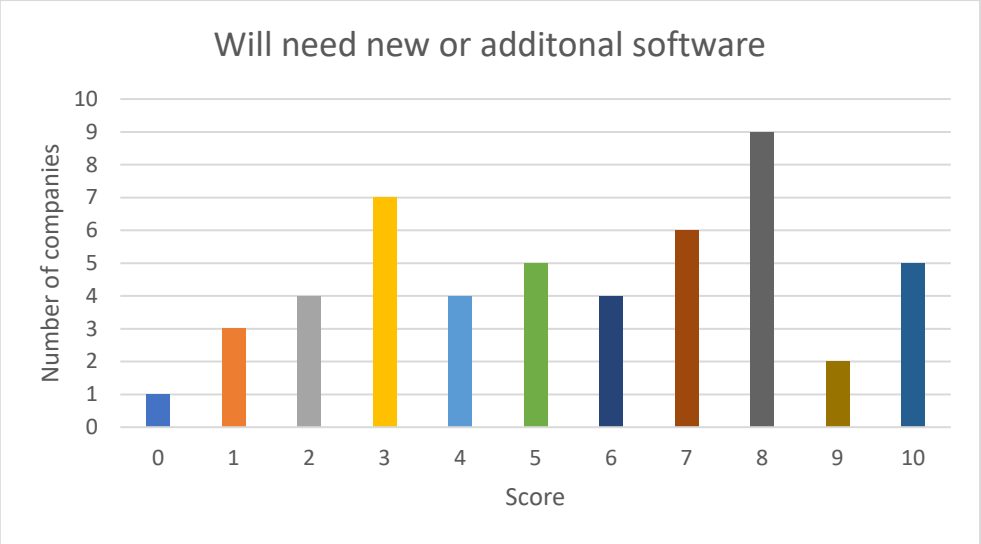

Figure 12: Need for new or additional specialised software

In this question, we used a scale from 0 to 10 where the respondents ranked their need for new or additional specialized software in the near future. To visualize the collective trend, we found the average score among all the respondents. The average need for new or additional specialized software was *5.58*. The spread is shown in the following bar chart.

4.3.5 Important Attributes of Specialized ESG Software

"What would your demand be if your business was to buy specialized ESG software? What would be of importance?

This question asked the respondents to rate the importance of different attributes if the business was to acquire specialized ESG software. This was done using scales from 0 to 10. One attribute represents one scale.

Attribute	Average Score	Explanation
Easy to use	7.82	System requires little training
Web solution	7.5	System hosted in the web browser
Accuracy	7.48	Error of the output is as small as possible
One software covers all	7.42	One system to handle all possible reportable ESG metrics
Price	7.08	Price on system satisfies customer
Module based	7.04	One system with the ability to expand with modules serving different ESG metrics
Integration with existing software	6.86	System can be integrated in existing corporate software
Desktop solution	4.72	Downloadable system, run as an application locally
Individual system for each metric	3.08	Buy individual systems for each metric

Table 3: Important attributes – average scores

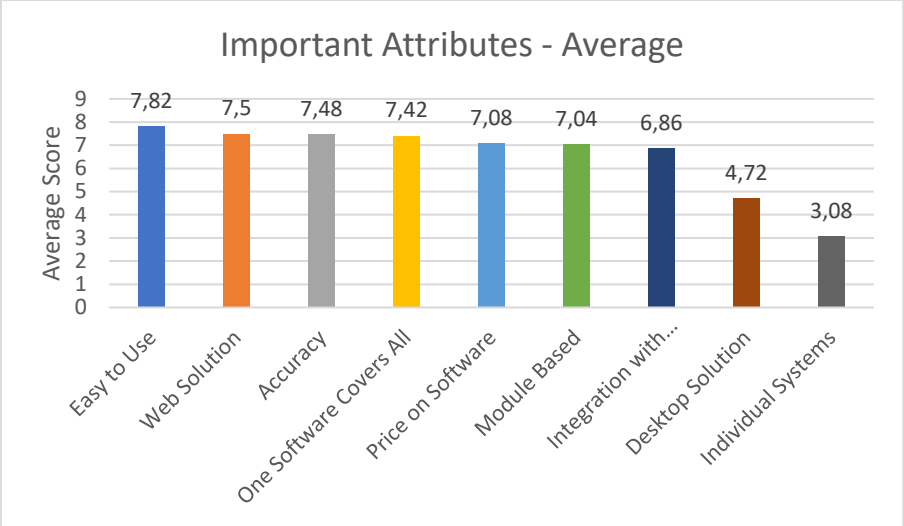

Figure 13: Important Attributes - average scores

The results of this question may be interesting information for the development of future services for Celsia. The attributes are inspired by a set of different industry standards for the development and delivery of SaaS systems. According to the results of this question, the least important attribute is *"Individual system for each metric".* The average score for this attribute is 3.08. In addition, when looking at the scores for *"Module based"* (7.04) and *"One software covers all" (7.42),* this emphasizes that the companies want either one "universal" system to cover all possible ESG metrics or one system that is module-based and can expand its coverage and functionality through the acquisition of more modules.

4.3.6 Buy New Software

"Does your business look into buying new ESG software?"

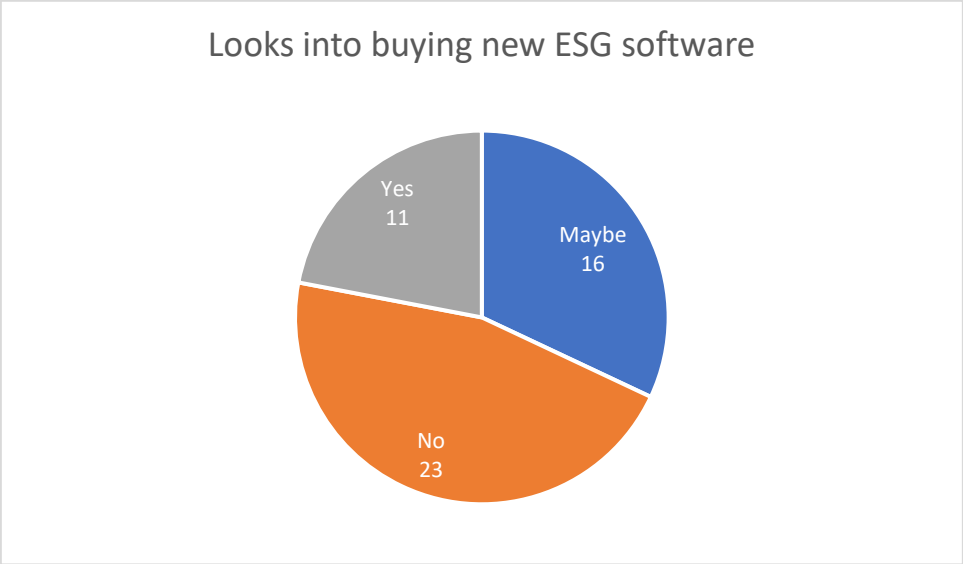

Figure 14: Number of companies looking into buying new ESG Software

The purpose of this question was to find out if a willingness to buy specialized ESG software exists. Out of the 50 respondents, 22% (n=11) answered "Yes" when asked if they considered buying new software. 32% (n=16) answered "Maybe", and 46% (n=23) answered "No".

4.3.7 Price Range - New Software

"In which of the following price ranges would your business be willing to pay for new ESG software per year?"

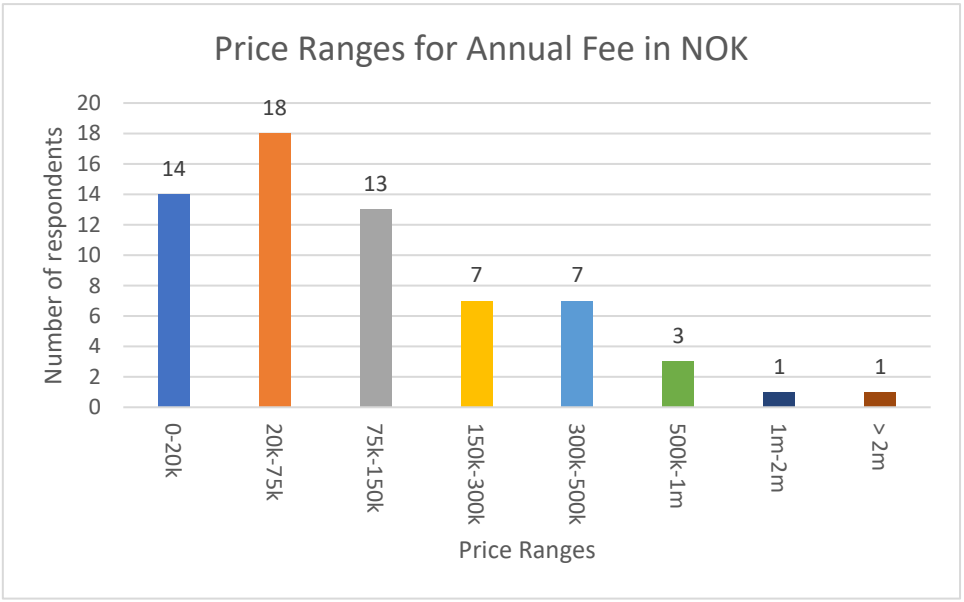

Figure 15: Price ranges for paying an annual fee for software

Important insight when looking at the results from this question is that it was structured as a checkbox question where the respondents had the option to include several of the price ranges in their answers. This has led to the number of answers (64) exceeding the

number of individual respondents (50) and is important information to avoid misunderstanding. From the results, we can read that the most frequent price range is 20 000-75 000 Norwegian kroner (NOK), with 36% (n=18) of the companies answering that this would be within a price range they would be willing to pay annually for ESG software. Not surprisingly, the two highest price ranges are also the two least popular options. Both (1-2 million & >2 million), with only 2% (n=1) willing to pay within these price ranges.

4.3.8 Key Owner of Software

"Who is or would be the key owner of an ESG software solution at your business?"

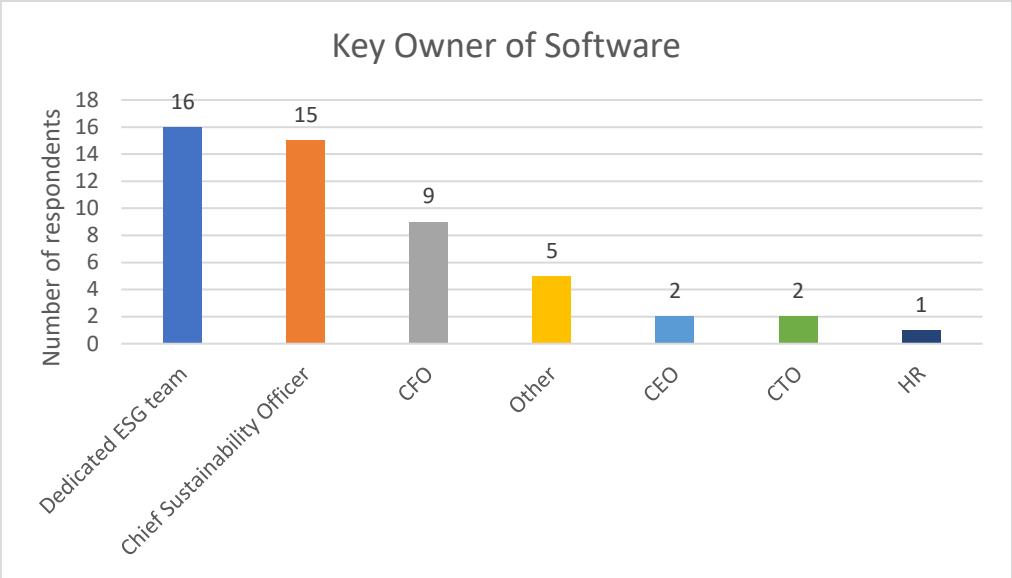

Figure 16: Key owner of software

With this question, we were trying to map out the key owners of ESG software. This can be valuable information for Celsia when approaching potential customers. The two major identified key owners of this question were Chief Sustainable Officer and Dedicated ESG Team, with 30% (n=15) and 32% (n=16) of the responses. An unexpected result from this question was that CTO had such a low response rate, with only 4% (n=2) of the responses. HR has the lowest response rate with only one response.

4.4 Motivations for ESG Reporting

In this section of sliders, we were trying to capture the motivations of the different companies regarding ESG reporting. They were asked to rank different statements from 0 to 10, where 0 represented a not motivating factor and 10 a substantial motivating factor.

"ESG reporting is important…"

Statements	Average Score
…compliance with regulatory requirements.	8.54
…to satisfy my company's stakeholders.	8.18
…to nurture investor relations.	8.16
…to improve risk management towards sustainability.	7.78
…to use as input for strategic decision-making and improvement of policies.	7.46
…to strengthen my company's branding.	7.46
…to meet the customer demand for reporting.	7.42
…to emphasize the link between my company's financial and non-financial performance.	7.04

Table 4: Motivations for ESG reporting – average scores

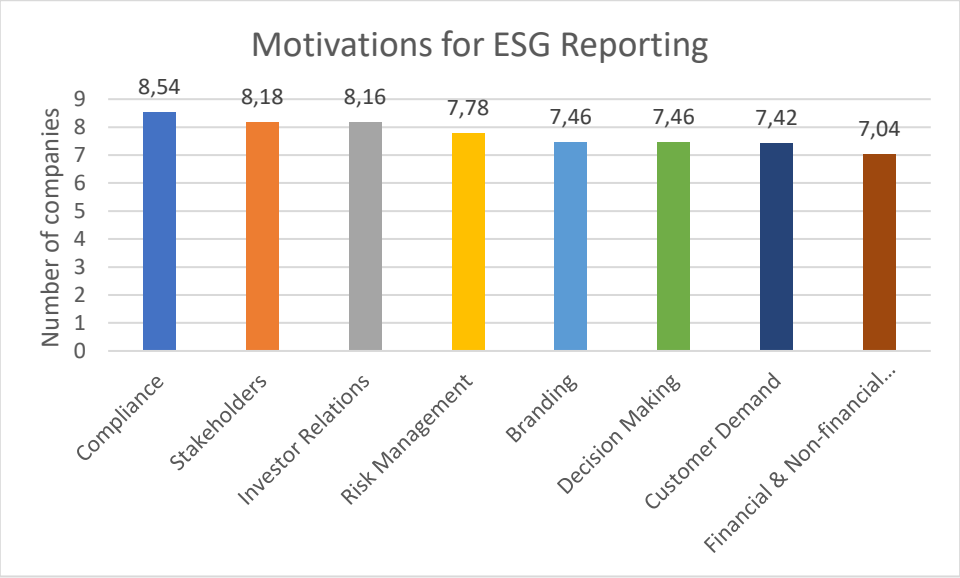

Figure 17: Motivations for ESG reporting – average scores

Table 4 and *Figure 18* show that the average scores on the different motivations are high. This can be seen as a weakness in our survey. *"…to emphasize the link between my company's financial and non-financial performance."* is the lowest scoring statement, with an average score of 7.04 out of 10. Another interesting score is *"…compliance with regulatory requirements."*. On this statement, the average score was 8.54 and the

highest of all the statements, which means that among all the surveyed companies, the most important and motivating factor to report on ESG data is compliance with regulatory requirements.

4.5 The EU Taxonomy

4.5.1 Taxonomy Score

"Do you know your company's taxonomy score?"

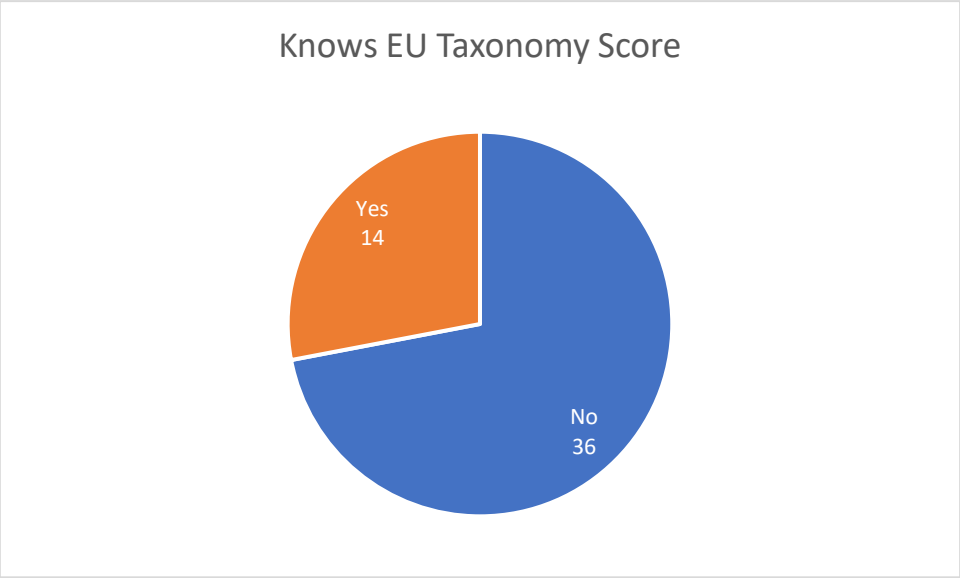

Figure 18: Number of companies knowing their EU Taxonomy score

As seen in figure 18, only 28 % (n=14) of the companies' representatives knew their taxonomy scores. 72% (n=36) of the respondents have answered that they do not know their score. "Don't know" was not included in the respondents' options on this question.

4.5.2 Plans to report

"Are you planning to report on the EU Taxonomy in 2022 or 2023?"

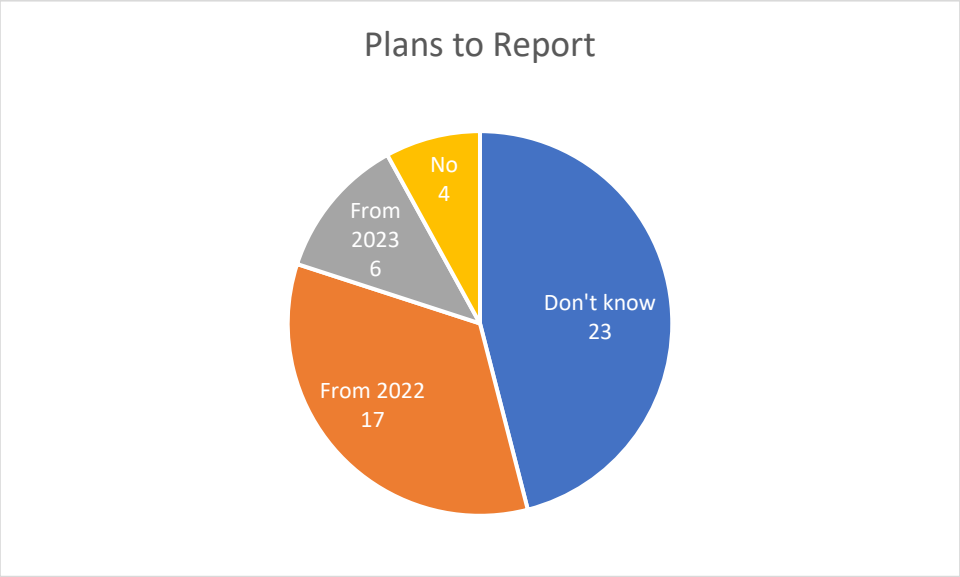

Figure 19: Companies planning to report on the EU Taxonomy

Since the EU Taxonomy is operational for Norwegian companies from January 2023, we found it interesting to map out how many of the respondents planned to report on the taxonomy within 2022 and 2023. As seen from the results, 46% (n=23) of the respondents do not know if their company plans to report on the EU Taxonomy within the next two years. 34% (n=17) of the respondents answered that they plan to report on the taxonomy from 2022, and 12% (n=6) plan to report from 2023. 8% (n=4) of the companies have answered that they are not planning to report.

4.5.3 Utilization of specialized software in taxonomy reporting

"Do you use specialized software to simplify reporting on the EU Taxonomy?"

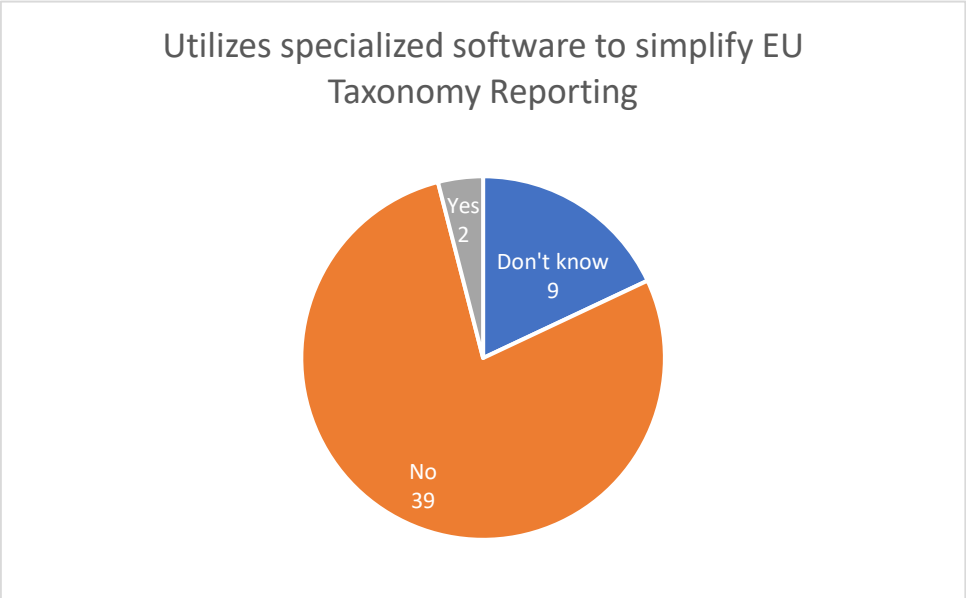

Figure 20: Companies utilizing specialised software to report on the EU Taxonomy

The last question of our survey was about whether the companies, as of today, utilize specialized software to report on the EU Taxonomy. 18% (n=9) answered "Don't know", 78% (n=39) said "No", while 4% (n=2) answered yes. Out of the two that answered "Yes", one used in-house developed solutions, while the other was considering using a system called Parseport to simplify taxonomy reporting.

5 Analysis and discussion

The results will be discussed through the lens of the theoretical background to emphasize trends, connections, and abnormalities in the results toward the demand regarding ESG reporting and the use of specialized ESG software. The discussion will form the foundation for a conclusion giving recommendations to Celsia on what they can expect their customers' demands to be and how they can utilize our recommendations to expand their services.

5.1 What is reported on today - with and without specialized software

The type of metrics reported today is affected by regulations already implemented, especially here in Norway. Already existing laws in Norway demand reporting on metrics that typically would fit in as a part of a company's ESG reporting. An example of this is "Likestillingsloven", where companies report to the government on equality metrics in their organisation. When asked about which ESG metrics they report on, many companies will therefore include the reporting of these types of metrics. However, this can give a slightly inaccurate picture of reporting practices since "Likestillingsloven" is not regarded as a law addressing ESG but rather the government's law to secure equality among Norwegian companies. In addition, this information is not as easily obtainable for investors or other stakeholders as with dedicated ESG information. This chapter will discuss what type of metrics Norwegian public traded companies report on and to what extent software is used to report.

5.1.1 Environmental reporting

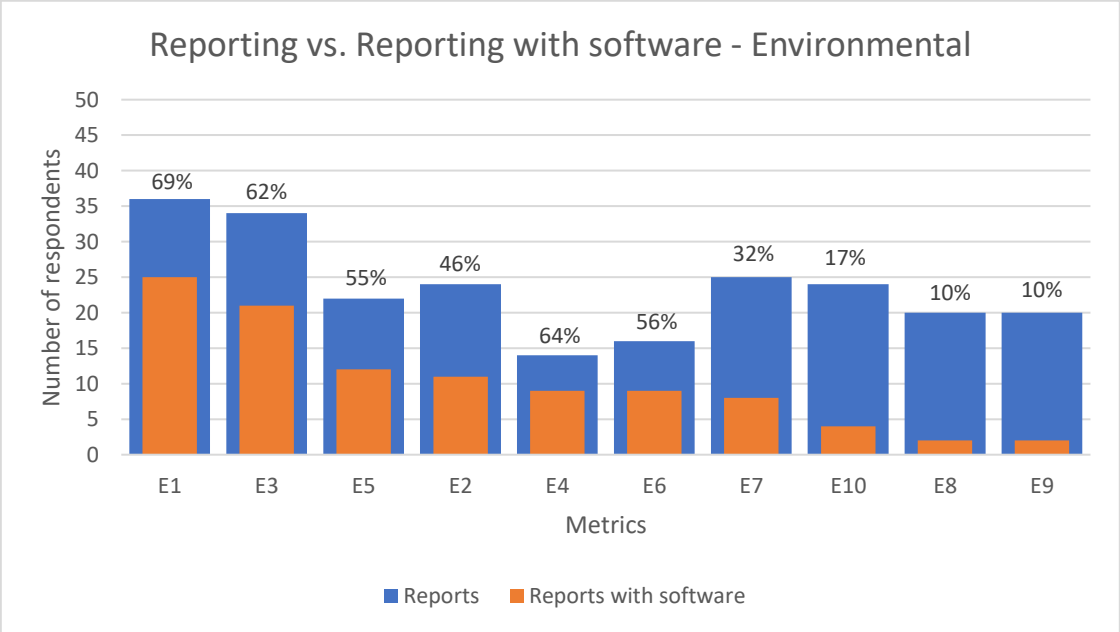

Figure 21: Percentage of reporting done with specialised ESG software on environmental metrics

Reporting on environmental related metrics is not something that businesses in Norway are unfamiliar with. Because of mechanisms such as Carbon credits and other governmental reporting requirements, Norwegian companies deliver comprehensive

reports on environmental related topics, especially related to GHG emissions and usage of resources and energy (Miljødirektoratet, 2022). It is reflected in the results as 72% reports on *E1. GHG emissions* and 68% on *E3. Energy Usage*.

An interesting observation from these results is the high use of software on highly quantifiable metrics deriving from clear, structured data sources with easily obtained data. *E1. GHG emissions*, *E3. Energy usage*, *E4. Energy intensity*, *E5. Energy mix* and *E6. Water Usage* are examples of metrics with these qualities and are arguably a good fit when developing ESG reporting software since software development is easier with structured, processable data.

There is a trend when observing *E8*, *E9* and *E10*, which are especially low on software usage. These metrics are not as quantitative as the other ones. *E8. Climate oversight/board*, *E9. Climate Oversight/Management* and *E10. Climate Risk Mitigation* are more qualitative based and requires a more subjective judgement. These assessments do not have the same clear data background as the other more quantitative metrics and need a more comprehensive understanding to be measured.

5.1.2 Social reporting

Reporting on the Social metrics in Norway is heavily influenced by the already existing regulations and legislations. Due to "Likestillingsloven", employers are demanded to report some of these metrics if they are of a certain size. In addition to reporting on equality, employers are also obligated to report work-related injuries and safety standards (Arbeidstilsynet, 2022). Such regulations may give high reporting numbers even though they are not directly linked to ESG-reports.

By comparing social metrics against the environmental metrics, one can see that more companies are reporting on social than environmental metrics. This mainly comes from the fact that companies which are not affected directly by Forurensningsloven are subject to vaguer regulations which do not clearly state what to report on within the environmental pillar (Forurensingsloven, 1983, §1-5). On the other hand, social metrics are something every sector equally must report. Therefore, it is natural that there are more reports on social metrics in Norway.

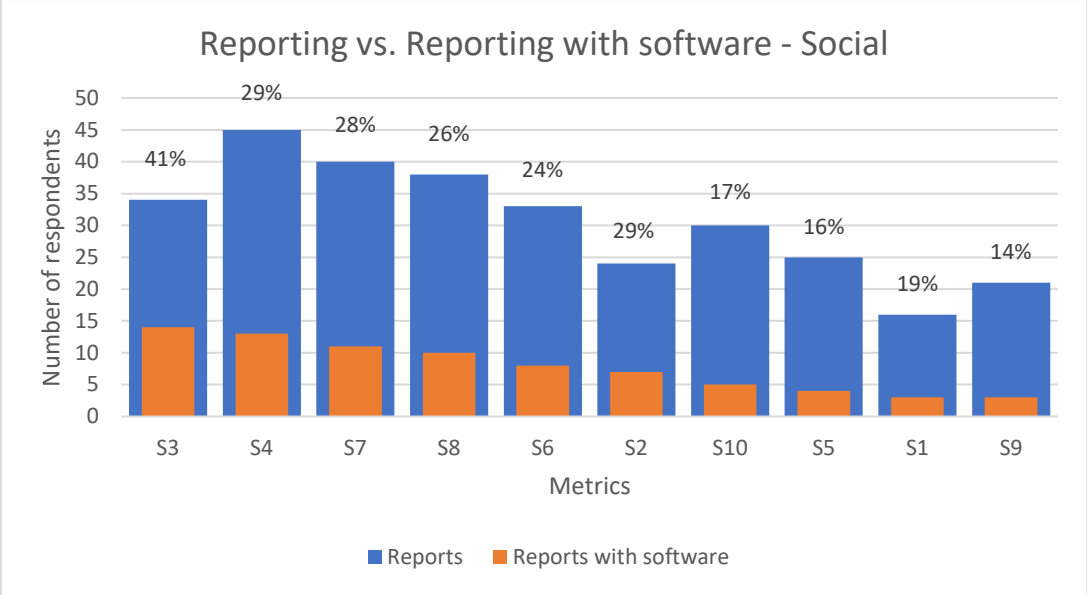

Figure 22: Percentage of reporting done with specialised ESG software on social metrics

Even though more companies report on social metrics compared to environmental metrics, more companies report with specialised software on the environmental metrics. Out of all companies reporting on environmental metrics, 43.8 % used specialised software, while 25.5% used specialised software on social metrics.

One might say that the reason is that measuring some environmental metrics are more suited for specialised software due to the nature of the metric. For example, to measure emissions and water usage, several data sources and calculations are needed to complete these. For social metrics, one may not need specialised software. For example, calculating gender diversity is simple to do in excel and the same with temporary work ratio. On the other hand, reporting on pay ratio may become a bit complicated when considering temporary workers and other forms of employment. This again is affected by the company's size and what type of business they are. A company with sixty employees with 100% employment is a lot easier to report on with excel than a company with 15 000 employees where half of the workforce has different grades of employment than 100%.

One could debate whether there actually exists a demand for specialised software on social metrics. However, many of the social metrics can be related to equality and diversity, which is metrics the Norwegian government wants companies to report on through the "Likestillingsloven" and its "Aktivitets- og redgjørelsesplikten" (The activity duty and the duty to issue a statement) (ARP). A Norwegian company called Equality Check offers a SaaS dashboard solution, much like Celsia's own solution for the EU Taxonomy, which can be utilised for reporting on the ARP. Using company data, Equality Check's solution delivers insight into an organisation's diversity (Equality Check, 2022). Even though our results show that there is less software being used to report on social metrics, there is arguably still room for such specialised software solutions on social metrics when looking at Equality Check's solution.

5.1.3 Governance reporting

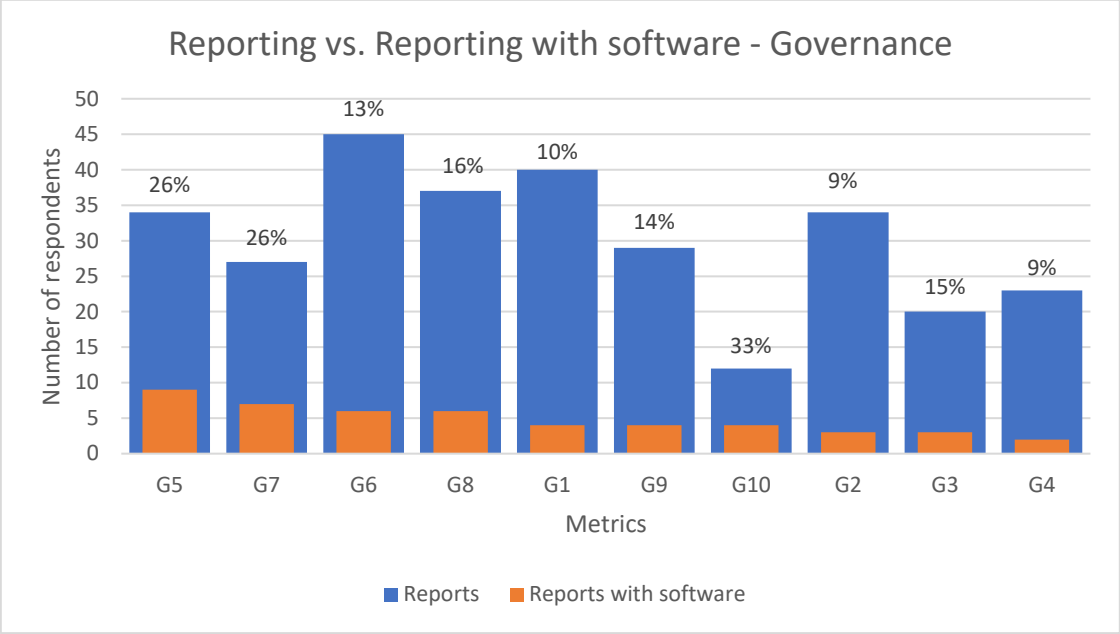

Figure 23: Percentage of reporting done with specialised ESG software on governance metrics

Figure 24: Percentage of reporting done with specialised ESG software on governance metrics

Governance metrics have a similar position as the social metrics. Some metrics under governance are affected by "Likestillingsloven", such as *G1. Board Diversity* and *G6. Ethics & Anti-corruption*.

Furthermore, *G2. Board Independence* is reported through "Brønnøysundsregistrene" (Lotteri- og stiftelsestilsynet, 2022) and *G7. Data privacy* is under GDPR law and must be reported to "Datatilsynet" (The Norwegian Data Protection Authority) (Datatilsynet, 2021). This shows that governance metrics are heavily affected and sometimes mandatory through the laws and legislations by the Norwegian Authorities.

Governance metrics also have a high report rate. However, it has the lowest report rate using specialised software of the three pillars with only 16%. Due to the nature of the metrics, they do not necessarily need specialised software to be completed. This follows the trend from the social pillar, where similar metrics have lower use of specialised software.

Further, we can see that the metrics *G8. ESG Reporting*, *G9. Disclosure Practices* and *G10. External Assurance* are connected. One cannot report on *G10* and *G9* without completing *G8*. An interesting fact is that while 37 companies publish an ESG-report (*G8*), 29 of them follows some framework (*G9*), and only 12 of them have it audited by a third party (*G10*). That 37 companies publish an ESG-report is impressive. However, when so few get them audited by a third party, the reports lose some credibility. The loss of credibility is further strengthened by the lack of an

framework for auditing. With "Offentliggjøringsforordningen", which follows the CSRD, it will be required to get the reports audited, so metric *G10* can expect to see an increase in reporting rate.

These statistics on reporting metrics are most certainly affected by the laws and regulations in Norway. However, it can be argued that it makes it easier for Norwegian companies to adapt to ESG reporting and its demands when regulatory standards and frameworks arrive from the EU. We see that there is already use of specialised software in reporting, especially when it comes to Environmental metrics with quantitative nature. One can see that it is the primary trend in using specialised software among all the pillars. If the metric is more quantitative and has a strict way to be calculated, the barrier to using specialised software is less significant. If calculations need a more qualitative and subjective approach, it will be more challenging to use specialised software as of today.

5.1.4 A summary for software usage among the pillars of ESG

Generally, for all the pillars, we see that an important aspect of whether to use specialised software is the access to solid and correct data, regardless of the metric. To calculate and measure different metrics, it is important to know what data to use and how to use it. As discussed, some metrics do not have a natural quantitative, measurable approach with clear data sources, making it difficult or inadequate to acquire and implement specialised software to assist these measurements. Suppose it were to be given regulations on what type of data to use and how to calculate the metrics. In that case, one can argue that the barrier for both developing, distributing, and acquiring specialised software would possibly be less limiting. One can see signs of it in the environmental metrics, especially *E1* and *E3*, since they are, as earlier mentioned, heavily legislated with clear data sources and calculation methods.

One considerable problem of ESG reporting is the subjective and individual choice of data sources and the importance of metrics. Regulatory standards and frameworks may limit the freedom of how ESG reports are assessed and specify how to complete the calculations of metrics. With equal course of action in completing the metrics and reports, the frameworks will also promote transparency and uniformity between the reports and make them more comparable. This will be more achievable for metrics with existing standards and frameworks and clear data structures. It will be slightly more challenging for the metrics that have a more subjective nature to their evaluations. What data and calculations to be used can possibly become heated discussions since different company metrics have different weightings and can be subject to biased evaluations. Since companies are different in nature, the rating methods and results will have difficulty being uniformly calculated. Companies interested in reporting on ESG would, without regulatory standards and frameworks, choose the solution that gives them the best reports. One can argue that this is one of the reasons for the low use of specialised software. With regulatory standards and frameworks, the data sources and methods would be clear, and the use of specialised software would arguably be higher. Even though some of the calculations still can be completed with generic software, the clarity in which data sources to use will make specialised software a valuable option to other, more generic software such as Excel. However, the subjective nature of some companies and metrics can make it challenging to achieve a full-fledged ESG report without some form of subjective assessment.

Since the main task of the upcoming CSRD and "Offentliggjøringsforordningen" is to make every listed company report on all instances of sustainability, one can assume that this will increase overall reporting on the ESG metrics. An overall increase in reporting will again increase the demand for specialised software to complete these reports - it is only logical to assume that the demand for software will increase when companies are demanded to report.

5.2 What tools are used to report?

From our results, we observe a variety of tools the different companies are utilising in their reporting practices. One can argue that this results from no regulative standards and frameworks, already existing laws and legislations, and the complicated landscape of ESG-reporting.

The use of in-house developed software can be argued to derive from the low regulations on some metrics, which leaves uncertainty on exactly what to report. This uncertainty makes an in-house solution the perceived easiest way to report for some companies. In-house developed software is more controllable and can, to some degree, be used to alter the results for the companies' benefit. If the standards and frameworks do not state how the calculations should be completed, the use of in-house solutions can be tempting since they can easily be adapted and controlled. Again, this is boosted if the calculations are easy and straightforward as some social metrics are.

The use of external consultants can be explained by the fact that the assessments can be comprehensive and complicated due to the vast landscape of reporting methods and standards. The easy way to get a report can then be to outsource to external consultants. ESG-consultancy is set to have an annual growth of 17% each year and reach $ 16 billion by 2027 (Molero, 2022). This is a sign that even though Norway and the rest of the world are moving closer to common regulatory standards and frameworks, there are still projected high spendings on consultancy. The high projected spending may insist that it is expected a period forward that is still filled with uncertainty and lack of knowledge of what to do.

The least utilised tool to report on ESG metrics is specialised external software. The landscape in which the ESG reporting solutions operate today is complex, and it varies which metric that is suited for specialised software solutions. Regulatory standards and frameworks would open for more use of specialised software because they clearly will state what to report. This clarity will make the evaluation of investing in software more straightforward for the companies, as they can compare standards and frameworks to software functionality and thereby see if the software fits their needs or not.

To understand why some companies use a specific solution, one can use the TAM model developed by Davis (1995). The complicated landscape around ESG reporting makes up an essential part of the external variables in the TAM model. The extensive use of in-house developed solutions may result from these uncertain external variables. An in-house developed software may be seen as the safest option since the companies can tailor this solution to their existing systems. These external variables affect the perceived usefulness and perceived ease of use of an in-house developed software system, which again enhances the intention for actual system use. The attitude towards

use is further enhanced by the possibility of adjusting low-regulated metrics to the companies' own benefit, which is easier done with self-controlled software.

For the use of consultants, the TAM model is not the best suited to explain this usage due to it not being software. However, another perspective of the TAM-model can show why consultancy is an alternative for many companies. The external variables affect both the perceived ease of use and perceived usefulness of a specialised software system. These variables can be so negative that using a specialised reporting system is not a viable option. In other words, the variables give no behavioural intention to use, which leads to no use at all. The result is outsourcing ESG reporting to external consultants.

As seen through the TAM model, the actual system use is, from the ground up, decided by the external variables. To facilitate the use of external specialised software, one will need to be able to handle external variables, strengthening perceived ease of use and perceived usefulness. Some external variables, such as the lack of regulatory standards and frameworks, create uncertainty around the software and can be hard to handle. As these regulations come, these uncertainties may disappear. Here Celsia needs to show that the system is ready to accomplish the needed tasks and in a way that is better than both in-house developed software and consultants. External variables are different from company to company. However, looking at the TAM model, Celsia should mainly focus on facilitating a high degree of perceived usefulness since it directly affects the behavioural intention to use their system. Perceived ease of use is important, but perceived usefulness has a heavier effect on the overall actual system use. To demonstrate a potential ESG reporting system's usefulness, Celsia should focus on how the system is more ready and resilient toward external factors such as upcoming regulatory standards and frameworks than external consultants and in-house developed solutions.

5.3 Demand for software in Norway

Understanding the demand for specialised ESG software among Norwegian companies is essential to answer the first part of our problem statement adequately – *"what are the present and future demand for specialised ESG software among Norwegian companies…"*. As reported in the results, the average score among the respondents regarding the need for specialised software in the future was 5.58/10.0. Even though it is a relatively mediocre score, it can be argued that it shows an overall small but existing need for specialised software among Norwegian companies. It can be many reasons for such a result. The respondents might think the tools and solutions they are currently using are adequate for their needs. It is also conceivable that the feeling of need is affected by other factors such as the company's purchasing power or the respondent's knowledge of the field. If the company does not have a dedicated sustainability role, some of the respondents might be employees of finance or law in the company. This person might not have sufficient insight to evaluate the company's need for specialised ESG software. Giving an overall interpretation of the score of 5.58/10.0, one can say that the score indicates a certain degree of a pending demand, with a slightly positive weighting towards a need.

Measuring the need for software is important. Furthermore, to gain insight into the details of the need, the respondents were asked to rank different software attributes that might be of importance when considering a purchase of specialised ESG software. An interesting result is that "One software covers all" got 7.42/10.0, while "Module-based"

received7.04/10.0. A "one-fits-all" system might sound like an easy and low-effort alternative for the companies. However, one would initially think that module-based software systems would be more alluring to the companies to reduce the risk of paying for functionality they do not need. Furthermore, developing a system that covers all necessary ESG metrics is arguably very challenging today in Norway and the world. As discussed in the theory section, the lack of regulatory standards and frameworks on both calculating and disclosing practices creates an immensely challenging environment for software developers who are trying to develop a "universal" software for ESG reporting. Not surprisingly, one can see the respondents give "Web solution" a score of 7.5/10.0, while "Desktop solution" receive a score of 4.72/10.0. The development and use of web solutions, in this case, "software as a service" (SaaS), has for the last ten years been growing rapidly, and one can argue that it has become the new standard for the development of software systems (Christ, 2021). This fits well with two other highly ranked attributes – "Easy to use" with a score of 7.8/10.0 and "Price" with 7.08/10.0 since these attributes are two of the main benefits of using SaaS systems. SaaS systems are easy to implement and use and provide low cost to begin operation.

For a SaaS to be a viable solution as ESG-software, the upcoming regulatory standards and frameworks need to be on the same level as the EU Taxonomy regarding clear requirements of what to include when reporting. SaaS, as earlier mentioned, is not very customisable, and for it to be a good alternative as a reporting software, the regulatory standards and frameworks arguably need to have a high weighting of uniformity. When looking at the Taxonomy, one sees clear definitions and attributes of what data sources and calculation methods to use and how it is universal for all companies with taxonomy-aligned activities. Forthcoming regulatory standards and frameworks will also have to be built on these principles. Then the SaaS can "fit all". The most likely scenario is that the regulatory standards and frameworks will be introduced gradually. If this is the case, a module-based SaaS system would fit the bill best. As the standards and frameworks take place, companies can add modules as they need.

Results on the willingness to invest in new specialised ESG software were also helpful in understanding the demand among Norwegian companies. While only 11% informed that they investigated acquiring new software, 46% answered "Maybe". Here, we can draw a parallel to the need for software, where we also got uncertain and pending results with an average score of 5.58/10.0. With almost half of the respondents answering "Maybe" to buying new software, it can strengthen the assumption of a degree of uncertainty among the companies whether they need specialised software or not. As the environment of ESG reporting is constantly changing with new regulations and standards being introduced and revised rapidly, it is understandable that companies are struggling to know what they need and whatnot. For Celsia, it could be of great importance to enlighten and demonstrate to their target group how specialised ESG software will impact ESG reporting — in other words, revealing the benefits of using specialised software to report.

Revealing benefits can be done by looking at some of the principles developed by Peppard et al. (2007) for realising benefits through IS/IT. Principle 2 states that "benefits arise when IT enables people to do things differently". As seen in the results from section 4.2.4, "How do the companies report?", 58% of the companies utilised an in-house developed solution, and 46% hired external consultants to assist with ESG

assessments. One can argue that Celsia should focus on emphasising how a software solution could help reduce the use of both in-house developed solutions and consultants. Especially by reducing or abolishing the use of the latter, the companies can save costs as human capital arguably is one of the highest costs within a company (Bingham et al., 2020). In addition to reducing costs, an investment in specialised ESG software could prune down both resources spent on administration and operation costs associated with the in-house developed solutions.

Another important principle - number 3, states that "only business managers and users can realise business benefits". Knowing that benefits refer to the outcome of change and innovation through work processes, Celsia should communicate to the business managers the intended use of a potential system expansion to secure that identified benefits of using the system are realised. This is further discussed when we later address key owners of potential specialised ESG software.

5.4 Price ranges

The most desirable price range was 20 000 – 75 000 NOK. From the diagram, we can see that the popularity decreases the higher the price range. The results of this question are not of essential importance for Celsia, as companies of many different sizes have participated in the survey. Therefore, it is likely to believe that the respondents have selected price ranges similar to what they historically have been paying for software solutions of similar complexity. Either way, the pricing is scalable and customizable through different prizing criteria with a SaaS solution.

5.5 Who will be the key owner of specialized ESG software?

62% of the companies answered that either a dedicated person (Chief Sustainable Officer) or a dedicated ESG-team would be the key owner of a specialised ESG software. An interpretation of this can be that due to the complicated ESG reporting landscape, the companies find it necessary to allocate resources toward dedicated sustainability personnel.

The third highest respondent was the CFO which is not so peculiar. ESG reporting is, for many, strongly linked with financial activities due to its "accounting-like" approach. It is not unlikely that the CFO has a link to potential ESG-teams or a strong relationship with a Chief Sustainable Officer (CSO). As sustainability becomes more important for companies, one can argue that the sustainability departments of Norwegian companies will experience growth in both size and responsibility over the following years.

It is plausible that the companies' demand for specialised ESG software will be expressed through dedicated sustainability employees since their job is to provide knowledge about the landscape of sustainability reporting and what forthcoming regulations may affect them. For Celsia, it will be important to be a well-known provider of specialised software to these people in a new and forthcoming software market.

One can assume that CSO and dedicated sustainability teams will be project leaders or have an immense role in implementing specialised ESG reporting software. They can possibly take responsibility for benefit management as they presumably will understand what benefits such software should deliver. Their responsibility will be to invest in and implement such software to make it deliver "value for money". For Celsia to provide

sufficient software that meets the demand from customers, they must understand what benefits the companies seek to gain from such software. To show companies that Celsia's systems are the right choice, Celsia needs to show how their systems are easy to realise benefits through. This is done by addressing the five principles of benefit realisation, and the key principle here is "benefits arise when IT enables people to do things differently". A specialised ESG reporting system needs to complete ESG reporting differently than before to make it a lucrative option to acquire. As new regulatory standards and frameworks come, these tasks will have to change. It will be a great window of opportunity for Celsia to provide a solution that enables the benefits requested by the CSOs and sustainability teams.

As new regulatory standards and frameworks will arrive, more parts of the companies may have to be involved in sustainability reporting. Today, when reporting is done more voluntarily, one can argue that only a few departments are involved in the reporting. Forwards, the regulatory standards and frameworks will demand more reporting on data from several departments within the companies, like HR, law and the companies' boards. It may be more challenging for CSOs and sustainability teams to realise the benefits due to principle three, which states "only business managers and users can realise business benefits". As more departments get involved in the use of the system, more work may be required to realise benefits. Benefits here, for example, are "Reduce overall reporting time by 20%" or "Be able to send reports to auditing directly". A possible way for software to help accomplish given benefits through a system with many users can be by focusing on the attributes of easy scalability, limited user interface and standardised format of results. These attributes secure that the software can scale with any company, it can easily be learned by the users, and the results are recognisable and understandable for anyone. These attributes are some of the qualities of SaaS and maybe the best solution to realising benefits. This is also shown in the results where "web solution", which SaaS is, scores high on attributes of importance.

While these two principles for realising benefits are important, the first principle of benefit realisation can be argued to be as important. This principle states that "IS/IT has no inherent value". Celsia cannot sell its product and expect it to create value subsequently. It is the process that the software supports which is the value. Therefore, the software needs to facilitate the process to create value for the company and realise benefits.

5.6 Motivations to report on ESG

As pointed out in the results, the average score is high for the motivational statements. An explanation may be that they believe that every statement is important since they all are working on some form of sustainability reporting in their respective companies. They may find all statements motivating; however, we see some differences, especially regarding the highest and lowest scoring statements.

The lowest scoring statement "*…to emphasize the link between my company's financial and non-financial performance"*, with a score of 7.04/10.0, represents a dip in the average score of the statements. It scores high, however, somewhat lower than the others. This is interesting because studies show that a strong ESG performance gives a higher return on investments, attracts investors, lowers risk, and better resiliency during a crisis (Gençer, 2022). By emphasising this link, a strong ESG report can attract more

investors and show both strong economic stability while being sustainable. It not only attracts and makes investors satisfied - but also boosts the company's reputation and crisis resiliency.

The highest-scoring statement "*…compliance with regulatory requirements*", with a score of 8.54/10.0, shows a spike in the scores, with a score of 1.5 higher than the lowest-scoring statement. This is not a surprise due to the high regulations that Norwegian companies have. In other words, the highest-scoring motivational factor is the mandatory regulations from the Norwegian government.

Another interesting score is "*…to nurture investor relations*" and "*…to satisfy my companies stakeholders*". Investors and stakeholders use ESG reporting to gain additional insight into a company. It means that the three statements that scored over 8.0/10.0 all have one thing in common: a demand for disclosure and information about the company. The statement "*…to meet customer demand for reporting*" is somewhat of an outlier since it also emphasizes the demand for disclosure. Furthermore, this scores considerably lower than the other statements regarding information disclosure.

When looking at the scores around 7.5/10.0, one can see that the statements are more strategic-minded and focused on company development. These statements are; "*…to strengthen my company's branding*", "*…to use as input for strategic decision-making and improvement of policies*", and "*…to improve risk management towards sustainability*". It shows that ESG reporting within the companies is motivated by its benefit for self-development and strategic decisions. However not as motivational as the demands of disclosure.

5.7 Involving the EU Taxonomy

The idea behind including the EU Taxonomy in our survey was to see how a strictly regulated and concrete reporting framework impacted the use of specialised software in Norwegian companies. Thereby, we could also predict how Celsia could adapt a potential new specialised ESG software to future regulatory standards and frameworks.

Out of 50 respondents, only 28% knew their taxonomy score. In addition, we saw that 46% did not know if their company planned to report on the taxonomy in 2022 or 2023. There are several interesting angles to discuss with this information. For a long time, the EU Taxonomy was set to be operational in Norway on the 1st of January 2022. However, this has been postponed to the 1st of January 2023. Nevertheless, 46% are unaware of when to report, establishing the assumption that many companies yet have familiarised themselves with how to deal with the EU Taxonomy. An explanation for this can be the difficulty many companies have in understanding the importance of reporting and how to report. Also, some might not have the capability or resources to do so. Either way, one could expect that the companies had a more conscious approach towards the EU Taxonomy than what has been discovered through our results. Again, this emphasises the pending state of many companies, which we have discussed in previous sections. On the other side, 34% state that they are to report on the Taxonomy from 2022, 12% from 2023, and 8% reply that they will not report from either 2022 or 2023. A positive result for Celsia is that 92% of the investigated companies will report during 2022 or 2023, or they find themselves in a pending state. Arguably, the demand for their taxonomy

software and possibly other specialised ESG solutions, at least out of our results, can be considered lucrative.

5.8 Overcoming market scepsis with transparency

In a report assessing the utility value of the annual sustainability reporting among 100 of the most prominent Norwegian companies conducted by The Governance Group, one of the key findings was that many of these companies report on the potential upside of sustainable products and services. However, many fail to highlight the negative effects on sustainability (The Governance Group, 2021, pp. 28-31). This resonates well with Labella et al. (2019) findings stating that 90% of known negative events and data backing these events were not disclosed in either SEC fillings or sustainability reports delivered by American companies. Looking at the high degree of hired consultants conducting the ESG assessments for Norwegian companies, the lack of a unified framework required by law and a low rate of transparency and uniformity in the rating methods, there is arguably a chance that the ESG reporting among Norwegian companies are giving an inaccurate picture of the companies' sustainability data. To substantiate that this may be the case for Norwegian companies, we can look at how credit rating agencies (CRAs)[6] operated in the US prior to the Global Financial Crisis (GFC) between 2007 and 2009. Credit rating agencies' task is to rate a variety of securities and other financial assets by giving the asset and the issuer of the asset a score on the risk of investing in the asset and the financial stability of the issuer. This is much like what external consultants are doing through ESG reporting today and what Celsia does by helping companies calculate their EU Taxonomy score. The problem with the CRAs prior to the GFC was that their ratings were heavily influenced by deficiencies in the calculating methods and an unhealthy conflict of interest due to a business model called "the issuer pays", which led to falsely high ratings in the CRAs pursuit for revenue (Mullard, 2012, p. 77). Post GFC, it was pointed out that the inadequate ratings from the CRAs were a contributing factor to the fall of the American economy. According to shareholder and ESG theory, we know that ESG data, together with a company's financial information, are used by shareholders to evaluate the risk of investing in a company. In a study done of CRAs in the Indian capital markets, it was found that there was a decrease in the CRAs credibility in providing reliable and useful information for investors post the GFC (Krishnan et al., 2019, pp. 22-23). As new regulatory standards and frameworks are introduced in the upcoming years, one can argue that there will be greater demand for accurate data than what it is today. Furthermore, falsely good data will be exposed. Suppose today's investors react similarly to deficient ESG reporting as the Indian capital markets did to credit ratings post the GFC, one could argue that Celsia will have an opportunity to take place as a trustworthy and serious provider of ESG scoring, also beyond the EU Taxonomy scores.

[6] "Credit ratings refers to a quantified assessment of a borrower's creditworthiness in general terms or with respect to a particular debt or financial obligation. A credit rating can be assigned to any entity that seeks to borrow money—an individual, a corporation, a state or provincial authority, or a sovereign government." (Kagan, 2022). Credit rating agencies are the companies assigning these ratings (Finney, 2022).

6 Conclusion and recommendations

In this bachelor thesis, we have explored the demand for specialised ESG software among Norwegian companies. With the acquired data, we have tried to outline the opportunity Celsia has to expand its services. By investigating attitudes and practices toward ESG reporting among Norwegian publicly listed companies, we believe we have captured the state of demand for specialised ESG Software in Norway. Further, we have unified this insight with relevant theory from the field to give guidance in which direction Celsia could expand its services.

From our results, we uncovered several significant findings. First and foremost, high use of software relates to highly quantitative metrics with straightforward calculation methods. We found that the environmental pillar distinguished itself from the other pillars through higher software usage. However, the overall reporting rate was higher in both the Social and Governance pillars. This separation derives from already existing laws and regulations operational in Norway. However, this is not directly linked to ESG reporting. The low software usage can be explained by the subjective nature of many of the metrics within the Social and Governance pillars. Furthermore, the low degree of regulative standards and frameworks limits the use of software and gives the companies more freedom to report on the Social and Governance metrics through their own solutions. To this date, Celsia has focused on the Environmental pillar through their solution for reporting on the EU Taxonomy. However, we find a substantial potential for Celsia to expand its services to the two other pillars, especially regarding the arrival of new regulatory standards and frameworks. This will arguably quantify more of the metrics within the Social and Governance pillar, with requirements of how the metrics are to be calculated. As seen through software usage on highly quantifiable Environmental metrics, we believe the demand for software usage in the other two pillars will increase.

Since we saw that highly quantifiable metrics had a high use of specialised ESG software, we assume that the other, more qualitative metrics are reported with the help of in-house developed solutions or external consultants. Moreover, by utilising the TAM model, we discovered that the external factor of a complex and confusing landscape of ESG reporting emphasises this assumption. For Celsia, it is important to understand this external factor and emphasise to their potential customers how a system from Celsia can be an optimal solution in a vast and complicated reporting landscape. A part of emphasising this is to declare how a solution can realise business benefits, such as more efficient reporting processes and cost reduction by decreasing the use of human capital.

Our results on the need for software in the future showed that the companies, overall, had a pending demand with a slightly positive weighting towards a need. We believe that this also could derive from the complex landscape of ESG reporting, as discussed in the previous paragraph. Although we cannot conclude that there is a need based on this result, it is natural to assume that the demand may increase when regulatory standards and frameworks are implemented, as the highest motivating factor for companies to report was to meet regulatory requirements. This fits well when observing that 92% of the companies plan to report on the strictly regulated framework of the EU Taxonomy within 2022 or 2023.

The next question that needed to be answered was how a potential software solution from Celsia should be developed to expand their services. When questioning the companies, we identified several software attributes of importance. The highest scoring attributes led to the conclusion that a module-based SaaS solution would be the best fit. With a module-based system, Celsia can develop and launch its solution in modules as regulatory standards and frameworks are gradually implemented.

To give an overall conclusion, we find some demand for specialised ESG software among Norwegian companies today. From our research, we believe that this demand may increase when new regulatory standards and frameworks are introduced and implemented in the operations of Norwegian companies. We have identified that the Social and Governance pillar of ESG are areas that have a low degree of software usage. Therefore, an expansion of service should be directed towards these areas through the development of a module-based SaaS system that gradually can be expanded as the standards and frameworks are implemented.

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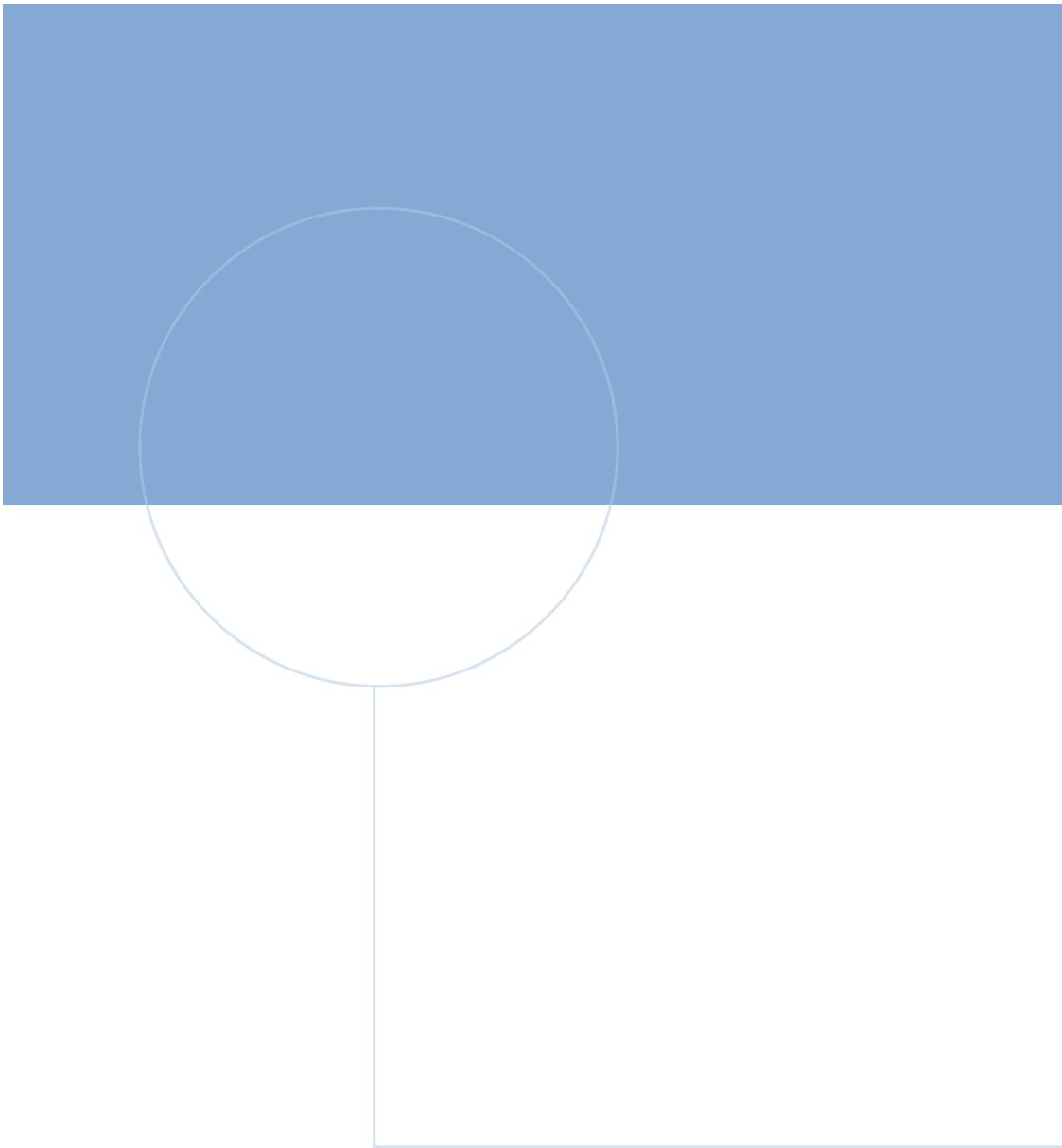
8 Appendix

Appendix 1: Survey



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