UiA University of Agder

Master

Decision making for sustainable development

An investigation of the Norwegian construction industry

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Preface

This thesis indicates is the final work in the course of our master's degree in Industrial Economics and Technology Management at the University of Agder (UiA). Throughout this thesis we gained knowledge and curiosity for the sustainable development in the Norwegian construction industry.

We want to express our sincere gratitude to our respondents for their involvement. Without you participating in our thesis, sharing knowledge and providing us with valuable information and feedback, this thesis would not exist. Thank you!

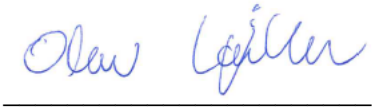
Also, we would like to thank our friends and family - your support and encouragement have been motivational and of high importance.

Lastly, we would like to share our gratitude for our supervisor, Dr. Rafael Heinzelmann. Thank you for guiding us the right direction from the beginning, and your continuous feedback and engagement. Your involvement has been essential for this thesis, and we are beyond grateful for your time and effort that you have devoted us.

The fulfilment of this thesis introduced to us a fascinating subject in a rapidly evolving construction industry. Whether you are a researcher, student or friend – we truly hope you will find our research interesting.

Grimstad, 18.05.2023

Varakan Ananthakumar



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Abstract

This thesis' aim is to investigate Norwegian construction firms' processes and frameworks for sustainable development, and how this may affect their eco-efficiency. Our analysis' overall purpose is to answer the following research question: "*How is Norwegian construction firms' decision making for sustainable development, and how does this affect the eco-efficiency of the industry?"*

To answer our research question, data has been retrieved through by using several methods. First, we conducted a cross sectional case study. The qualitative data has been collected through in-depth interviews with 8 different respondents with different positions, representing 8 different firms in the Norwegian construction sector. Second, we analysed the firms' financial performance and their environmental data by using the firms' annual- and sustainable reports, in order to retrieve quantitative data in form of net sales and CO_2 emissions.

Our analysis shows both similarities and differences in decision making for sustainable development in the construction sector. First contingency factors such as the firm's size, owners and employees all influence the environmental strategy and focus of the organization. Motivation for sustainable measurement, reporting and development are emphasised as a result from stakeholder pressure, oncoming legislations, financial gains, and the desire to guide the industry towards a more sustainable future.

However, based on our findings, we argue that today's environmental measurement and reporting is inconsistent and of low quality. Analysing the Norwegian construction firms' annual- and environmental reports depicts the vast differences in environmental data measured and reported. Moreover, our calculation of the eco-efficiency performances illustrates the dissimilarities regarding measurement and reporting of environmental data in the Norwegian construction industry. We urge the legislator to impose stricter regulations for measurement and reporting of sustainable data, facilitating for the resources available for the organizations, in order to help the industry to direct its efforts towards sustainable development.

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List of abbreviations

CSR	Corporate Social Responsibility
CSRD	Corporate Sustainability Reporting Directive
ESG	Environmental, Social and Governance
EU	European Union
GHG	Greenhouse Gas
GRI	Global Reporting Initiative
HSE	Health, Safety and Environment
ISO	International Organization for Standardization
KPI	Key Performance Indicator
MDGs	Millennium Development Goals
SDGs	Sustainable Development Goals
SME	Small and Medium-sized Enterprises
UN	United Nations
WBCSD	World Business Council for Sustainable Development

1. Introduction

1.1 Background

The building and construction industry has a significant influence on environmental and biodiversity impacts through resource use and emissions (Isaksson & Linderoth, 2018, p. 616). Hence, the industry's efforts to minimize these impacts are crucial in reducing our ecological footprints (ibid.). The importance of studying sustainability in the Norwegian construction sector is the focus of this thesis, by the reason that as organizations recognize that gaining a competitive edge depends not only on satisfying customers through low costs or quality products and services, but also depends on respecting the environment and demonstrating that they are socially responsible (Alencar et al., 2017, p. 62). Customers now expect companies to demonstrate environmental awareness, ethical practices, and social responsibility (ibid.). Sustainable development can be defined as improving the quality of life and enabling people to live in a healthy environment while improving, social, economic and environmental conditions for current and future generations (Ortiz et al., 2009, p. 29).

In light of growing concerns around sustainable development issues related to the environment, society, and the financial market, international organizations and countries worldwide have proposed action plans for sustainable development, such as ESG, in order to establish a comprehensive and sustainable framework for human society (Li et al., 2021). The ESG framework system includes Environmental (E), social (S), and governance (G) (ibid.).

The construction industry is recognized as one of the major contributors of Greenhouse Gas emissions (Hong et al., 2015). Consequently, there is evidence that there is increasing pressure from stakeholders to adopt more effective environmental practices, which will compel companies to give more importance to environmental issues in their strategic and operational decision making processes (Aguinis & Glavas, 2012; Benn et al., 2014, as cited in Isaksson & Linderoth, 2018, p.617). Due to the environmental aspect being the centrepiece in the construction industry, we decided to explore this aspect further.

As a result of global threats such as climate change and resource scarcity, there is an increasingly demand for tools to measure and evaluate energy- and resource-usage for firms (Götze et al., 2019). Eco-efficiency is one of these tools, which brings together economic and environmental progress (Verfaillie & Bidwell, 2000), used for the integrated measurement of both environmental- and financial performance (Figge & Hahn, 2013). The concept, already used in the 1970s (ibid.) but more popularized by the World Business Council for Sustainable

development in 1991 (Belem et al., 2021), is one of the most popular tools used by firms for managerial decision making (Figge & Hahn, 2013).

1.2 Research question and contribution

Through our research we aim for investigating Norwegian construction firms' processes and frameworks for sustainable development, and how this may affect their eco-efficiency. The following research question set guidelines for the present study:

"*How is Norwegian construction firms' decision making for sustainable development, and how does this affect the eco-efficiency of the industry?"*

Our study will give us insight into Norwegian construction firms' incorporation of a sustainable practice and how this impacts their eco-efficiency. The empirical data collected will later be discussed against current literature, in order to answer our research question. To answer our research question, we have used a mixed data collection method, including both qualitative and quantitative data. The reason is that if the research question asks for both numerical- and textual data, which is true for our thesis, then the researchers might use a mixed method in accounting research (Tucker & Hoque, 2017, p. 302). The qualitative data has been gathered through semi-structured interviews with 8 different respondents with various positions, representing eight different firms in the Norwegian construction industry. We have used semi-structured interviews to collect our data, which is commonly used in accounting research (Khalifa & Mahama, 2017b, p. 323). Furthermore, quantitative data, including information on the firm's net sales and CO_2 emissions has been collected from the respective firms' annual- and environmental reports.

The study involves eight firms, comprising small, medium, and large companies, with respondents of different ages, experiences, positions at the firm, and genders. By having a diverse interviewee sample, we aimed to obtain a comprehensive representation of the Norwegian construction industry, while increasing the credibility of the findings.

1.3 Outline

The outline of this thesis is structured in order to best present our solution to the research in the following way. There are five main chapters in addition to this introduction, and we start with presenting the theoretical background for this thesis. Relevant literature regarding the construction industry, sustainable development, decision making, and eco-efficiency will be presented in order to lay the theoretical foundation for the rest of the thesis. Followingly, the

methodology used in order to retrieve primary- and secondary data will be introduced, with an in-depth explanation of our choices made throughout this research in chapter 3. Afterwards, chapter 4 presents our empirical findings; key elements from the conducted interviews will be presented alongside a calculation of the included firms' eco-efficiency. Subsequently, chapter 5 discusses the empirical findings against our previously presented theoretical background. Lastly, we conclude and outline in chapter 6.

2. Theoretical background

2.1. Construction industry

The construction industry refers to the manufacturing and trade involved in building, repairing, maintaining and renovating infrastructures (Hussain et al., 2022). It can be said to be the determinant of a country's technical and technological advancement, playing a crucial role in regulating the growth of the country's infrastructural development, which translates to the advancement of sustainability assurance of the country (ibid.). Unfortunately, the construction industry is one of the biggest waste generating industries today (Afzal et al., 2017; Hussain et al., 2022). The construction industry is widely recognised as one of the primary contributors of global greenhouse gas (GHG) emissions and plays a significant role impacting global warming (Hong et al., 2015). The construction industry accounted for nearly 40% of energy use and CO_2 emissions in 2018 (International Energy Agency, 2019, p. 9). Recent information has indicated that the built area environment, which is the human-made structures and networks that surround us (Baker, 2021), has diverged increasingly from the targeted levels of carbon emissions reduction (i.e., 50 % reduction against 1990 baseline by 2025 and 80% by 2050) (Giesekam et al., 2015). According to the findings, the construction industry realised an 11% reduction in emissions in 2012 versus the 1990 baseline which was a lower reduction compared to the 17% achieved in 2009 (ibid.). The findings indicate a widening of the gap to the 50% sector reduction ambition by 2025, the built environment needs to achieve a further 39% reduction against the 1990 baseline to achieve this goal (ibid.). Emissions from the construction site may be high enough to raise concerns about whether new construction may hinder efforts to achieve GHG mitigation goals, regardless of how energy-efficient buildings are during their lifespan (Säynäjoki et al., 2012).

It is argued that the construction industry is among the major required stakeholders of the Sustainable Development Goals (SDGs), and it is therefore vital that the construction industry develops approaches to align its business strategies with the SDGs (Fei et al., 2021, p. 3). The SDGs are 17 goals that were adopted by all the 193 UN member states in 2015 to address the global development challenges to protect the planet, end poverty, tackle global inequality and much more (United Nations General Assembly, 2015) - in short, ensuring prosperity for all (ibid.). The 17 universal goals are supported by 169 targets and were at the heart of the Agenda for Sustainable Development at the 2015 United Nations General Assembly (ibid.). They apply for the next 15 years, ending in 2030 and replaces the Millennium Development Goals (MDGs)

which expired in 2015 (ibid.). While the MDGs aimed to reduce extreme poverty in all its forms, the SDGs pursue a more comprehensive agenda that includes the social, environmental, and economic dimensions of sustainable development, which is relevant for all countries worldwide (Kanuri et al., 2016).

The SDGs are guided by the principle of universality, all countries and citizens are responsible for their achievement (UK Stakeholders for Sustainable Development, 2018). This translates to all governments working to implement them in their own countries (ibid.). All sectors of society and all governments levels should integrate the SDGs in the local planning process to be able to successfully achieve the goals by 2030 (Fei et al., 2021). Adams (2017) states that the SDGs cannot be achieved without the collaboration between governments, the public and private sector, and civil society organizations. Among the 17 SDGs, 12 goals have particularly been identified as directly dependent on the construction industry (Goubran, 2019). To achieve the SDGs, there is a clear need to redevelop the construction sector (Wieser et al., 2019).

2.2. Sustainable development

Achieving sustainable development in the construction industry is a necessity, and it requires balancing economic growth with limitations on the consumption of resources (energy and waste) and the construction of environmentally-friendly buildings (Czajkowska, 2018). Sustainable development is a broad and increasingly popular term in both the academic and industrial world (Mitlin, 1992; Parris & Kates, 2003), and the term was first popularized in the publication of *Our Common Future* by the World Commission on Environment and Development (WCED), commonly referred to as the Brundtland Report (Holden et al., 2014; WCED, 1987). This report outlined the fundamental principles for what we now recognize as sustainable development. According to the Brundtland Report, severe environmental problems worldwide were primarily caused by the result of enormous poverty in developing countries and the unsustainable patterns of consumption and production in developed countries (Federal Office for Spatial Development ARE, n.d.; WCED, 1987). It proposed a strategy that combined development and environmental concerns, known today as "*sustainable development*" (ibid.).

The WCED explains development as the progressive transformation of both social and economy, and defines sustainable development as development that satisfies and fulfils the needs of today, without compromising future generation's possibility to satisfy their needs (WCED, 1987, p. 42). Holden et al., (2014) derives four primary dimensions of the Brundtland Report; *1)* Ensuring long-term ecological sustainability, *2)* Meeting and satisfying basic human

needs, *3)* Promotion of intragenerational equity, and *4)* Promotion of intergenerational equity. The Brundtland Report does not include economic growth as one of its primary dimensions (Holden et al., 2014). Consequently, the World Commission on Environment and Development's report conflicts with significant models and studies, such as *Triple Bottom Line* (See chapter 2.2.3) that emphasises on the relationship and balance between environmental, social and economic challenges (Elkington, 1997, as cited in Holden, 2014, p.131). In later years, other scholars have added economic growth aspects to the concept of sustainable development (Pearce et al., 1989).

However, the sustainable development term has been met with criticism by multiple scholars as not specific with no clear definition (Holden et al., 2014; Mitlin, 1992; Parris & Kates, 2003). Challenges and disagreements regarding factors such as what it is to be developed, over what period and what it is that needs to be sustained are all factors which create uncertainty and disagreement regarding sustainable development (Parris & Kates, 2003).

2.2.1. EU's Taxonomy and CSRD

To reach and fulfil the climate and energy goals for 2023 and the objectives of the European green deal, all members of the union need to develop and invest in sustainable activities. This is where the EU Taxonomy comes in; the taxonomy is a classification system for sustainable economic activities, i.e., it is a set definition and a "common language" of what objectives and values an activity has to fulfil to be considered sustainable (EU, n.d.). The EU (2023b) establishes that the taxonomy could have a significant role to initiate and helping European union members to implement and invest in the European green deal. Furthermore, the taxonomy may also assist and guide firms, private and public investors, policymakers and stakeholders to what is a sustainable activity (ibid.). The taxonomy's clear definition and standards of sustainable activities, may also prevent greenwashing, and consequently create a sense of security and reliability for investors and stakeholders (EU, n.d.).

The Taxonomy regulation published- and enforced by the European Union in 2020, established six different environmental objectives to focus on to contribute on making an economic activity sustainable; 1) *Climate change mitigation,* 2) *Climate change adaption,* 3) *The sustainable use and protection of water and marine resources,* 4) *The transition to a circular economy,* 5) *Pollution prevention and control,* and 6) *The protection and restoration of biodiversity and ecosystems* (EU, n.d.).

Furthermore, the regulation presented the foundation of the EU Taxonomy by introducing four general conditions that an economic activity must satisfy to be considered environmentally sustainable (Envoria, n.d.; EU, n.d.):

1) The economic activity must contribute to at least one of the six objectives mentioned above.
2) The economic activity cannot do "significant harm" to any of the six objectives mentioned above.
3) The economic activity must satisfy the minimum criteria, e.g., the United Nations' Guiding Principles on Business and Human Rights, to avoid causing a negative social impact.
4) The economic activity must satisfy and comply with the technical screening criteria established by the EU Technical Expert Group.

The CSRD (Corporate Sustainability Reporting Directive) is a new directive enforced 5th January 2023 by the European Union, which will be applied for the first organizations in the financial year of 2024 (EU, 2023). The directive introduces new and stricter legislations of what and how organizations report environmental information (ibid.). New and stricter legislations will ensure that sustainability information is available for investors and other stakeholders, while generating a culture for corporate transparency of their environmental impact (ibid.).

Although the Taxonomy and the CSRD is developed by the EU for the EU, it is yet to be employed in countries within the EEA Agreement (Agreement on the European Economic Area) (Regjeringen, 2023). However, the Norwegian government have already enforced a regulation regarding the Taxonomy (ibid.), and will by all expectations implement the legislations related to CSRD (NHO, 2023).

2.2.2. ESG and CSR

The European Union proposed the CSRD as a result of the strong interest in ESG (Economic, Social and Governance) reporting and sustainable development (Zahid et al., 2023, p. 352). The ESG term was coined in a 2004 report by 20 financial institutions, in response to a call from the United Nations Secretary-General, Kofi Anon (Gillan et al., 2021). ESG pertains to how investors and corporations integrate environmental, social and governance concerns into their business models (ibid.). A key difference between ESG and CSR (Corporate Social Responsibility) is that while CSR indirectly includes governance issues as they relate to

environmental and social considerations, ESG explicitly incorporates governance as a component (ibid.). Consequently, ESG tends to be a more expansive terminology than CSR (ibid.).

The environmental component (E) of ESG evaluates a firm's efforts to protect the environment by minimizing its impact on it, and includes factors such as climate change, natural resources, pollution, waste, and environmental opportunities (Lee & Suh, 2022, p. 1). The social component (S) evaluates how a firm treats its employees and the community it serves, and encompasses employee relations, working conditions, organizational diversity, human rights, employee equity and justice, inclusion, product responsibility, and community health and safety (ibid.). The governance component (G) assesses how a firm's management leads and provides oversight of their organizational authority (ibid.). Factors evaluated under this component are board functions and structure, firm policies, compensation, lobbying, corruption, donation, and the firm's vision and strategies (ibid.).

Similar to the ESG reporting landscape, there has been a movement around CSR; Xia et al. (2018) states that CSR has emerged as an increasingly important agenda in the construction industry in recent years. The European Commission (2011b) put forward a new definition of the term CSR (Corporate Social Responsibility) in 2011, defining it as "*the responsibility of enterprises for their impacts on society*". To fully meet their social responsibility, companies should establish a framework that incorporates social, environmental, ethical, human rights, and consumer considerations into their fundamental strategy and business operations, while working closely with their stakeholders (ibid.). This is done with the aim of optimizing the creation of mutual benefits for their owners/shareholders, and the broader civil society, as well as preventing and mitigating potential adverse impacts (ibid.).

The new definition of CSR includes some essential characteristics (European Commission, 2011):

- Acknowledgement of the importance of core business strategy. This is in line with the approach followed by leading enterprises that have integrated social responsibility and sustainability into their business models. The commission's 2008 report on competitiveness confirmed that CSR is most likely to contribute to the long-term prosperity of a company when it is fully integrated into the business strategy.
- Advancement of the concept of "creating shared value". This pertains to how businesses seek to produce a return on investment for their owners and shareholders by generating

value for other stakeholders and the society in general. This strongly links CSR with innovation, particularly in terms of designing new products and services that are commercially successful and help to address societal challenges.

- Highlighting the explicit recognition of human rights and ethical considerations, in addition to environmental, social and consumer concerns. CSR involves actions that companies undertake beyond their legal obligation towards society and the environment. Certain regulatory measures create an environment that encourages businesses to voluntarily fulfil their social responsibility.

After the first change of definition in 10 years by the European Commission, the new definition now aligns with globally recognized CSR principles and guidelines, such as the ISO 26000 Guidance Standard on Social Responsibility for instance (European Commission, 2011). It is expected to provide better clarity for companies and contribute to greater global consistency in business expectations, regardless of their location (ibid.). After the first change of definition in 10 years by the European Commission, the new definition now aligns with globally recognized CSR principles and guidelines, such as the ISO 26000 Guidance Standard on Social Responsibility for instance (ibid.). It is expected to provide greater clarity for companies and contribute to greater global consistency in business expectations, regardless of their location (ibid.).

In 2014, the European Commission conducted a public consultation on its CSR activities, which indicated a significant level of support for the action on CSR by the Commission, including Business and Human Rights (European Commission, 2019). Although approximately two thirds of respondents evaluated the overall impact as generally useful or very useful, there were identified certain areas requiring further support, such as improving transparency, international engagement, awareness raising and providing support targeting SMEs (ibid.).

2.2.3. Triple bottom line

In an attempt to develop a new language that could reflect the anticipated expansion of corporate models from a sole focus on economic values to a broader approach that includes sustainable practices, John Elkington (as cited in Mark-Herbert et al., 2010, p. 1) coined the term “Triple Bottom Line” in 1994. The triple bottom line provides a framework for evaluating the business performance and organizational success using the economic, social and environmental lines (Goel, 2010, as cited in Alhaddi, 2015, p.7), with the aim of embracing the

corporate sustainability objectives, as outlined in the Brundtland Report (United Nations, 1987, as cited in Mark-Herbert et al., 2010, p.1). Since 1994 the use of the term triple bottom line has drastically increased in academic literature focusing on sustainability (Mark-Herbert et al., 2010, p. 1). Consequently, the number of interpretations of the model has also grown (ibid.).

The economic aspect of the triple bottom line pertains to the impact of the organization's business practices on the economic system (Elkington, 1997, as cited in Alhaddi, 2015, p.7). This line is concerned with the sustainability of the economy as one of the subsystems of sustainability, and its ability to continue evolving and supporting future generations (Spangenberg, 2005, as cited in Alhaddi, 2015, p.7). The economic line connects the organization's growth to the growth of the economy, and how well it contributes to and supports it (Alhaddi, 2015, p. 7). Its focus is on the economic value the organization provides to the surrounding system, ensuring that it thrives and has the capacity to support future generations (ibid.).

The social line of the triple bottom line refers to implementing fair and beneficial business practices to the labour, human capital and the community (Elkington, 1997, as cited in Alhaddi, 2015, p.7). The goal is to provide value to the society and give back to the community, such as offering fair wages and health care coverage (Goel, 2010, as cited in Alhaddi, 2015, p.7). Aside from the moral aspect of being "good", neglecting social responsibility also affects the business's performance and sustainability, which has been proven by recent examples in the industries that have showed there are economic costs corresponding with ignoring social responsibility (ibid.). Missimer et al. (2010) evaluated the existing sustainability framework related to social dimensions and determined that the definition of social sustainability is less operational than other dimensions.

The environmental line of the triple bottom line alludes to engaging in practices that do not compromise the environmental recourses for future generations, such as efficient energy use, reducing greenhouse gas emissions, minimizing the ecological footprint, etc. (Goel, 2010, as cited in Alhaddi, 2015, p.8). Similar to the social line of the triple bottom line, environmental initiatives impact the business sustainability of the organizations (ibid.). An analysis by Kearney (as cited in Alhaddi, 2015, p.8) was done on 99 sustainability-focused organizations across 18 industries, ranging from technology and automotive to chemical, food, media, retail, and tourism, to examine the impact of environmental activities on organizational performance. The study intended to determine if organizations with sustainable practices were more likely

to withstand economic downturns and the analysis period lasted for six months (Kearney, 2009, as cited in Alhaddi, 2015, p.8). The analysis revealed that organizations with practices that protect the environment and improve the social well-being of stakeholders while adding value to shareholders have outperformed their industry peers financially during the current economic downturn (ibid.). This financial advantage resulted from reduced operational costs (energy and water usage, etc.) and increased revenues from developing innovative green products (ibid.).

2.2.4. Sustainability reporting

Stakeholders are now demanding more extensive disclosures, not limited to economic performance, but also encompassing a corporation's environmental and social practices (Waddock, 2003, as cited in Siew, 2015, p. 181). As a result, many companies have committed to improving their sustainability practices and transparency (Afzal et al., 2017). Through sustainability reporting, companies can convey their non-financial performance and consequences on the economy extensively (Sumiyati & Suhaidar, 2020). This type of reporting enables companies to disclose their environmental, social, and ethical impacts and reflect on them in a transparent manner (Afzal et al., 2017). Sustainability reporting can additionally enhance their reputation (Lozano et al., 2016, p. 180). Various international organizations are continuously developing indicators to measure sustainable development in companies, with the aim of establishing a globally recognized standard (Kocmanová, Hřebíček, et al., 2011). Followingly, some of the most common reporting standards regarding sustainability are presented.

GRI

The Global Reporting Initiative (GRI) is the most well-known international effort that focuses on standardizing sustainable development reporting (Kocmanová, Hřebíček, et al., 2011). The GRI standards allow organizations of all sizes, whether public or private, to understand and report on their impacts on the economy, environment and people in a credible and comparable manner (Global Reporting Initiative, 2023). This enhances transparency regarding their role in promoting sustainable development, making the standards beneficial not only to corporations, but also for stakeholders (ibid.). The GRI Standards undergo frequent evaluations to ensure that they reflect global best practices for sustainability reporting, assisting organizations respond to emerging information requirements of stakeholders and regulators (ibid.).

GHG

The GHG (Greenhouse Gas) Protocol offers the world's most widely used greenhouse gas accounting standards, which have been developed to provide a framework for businesses, governments, and other entities to measure and report their greenhouse gas emissions in a ways that support their goals and missions (Greenhouse Gas Protocol, 2023b). The GHG Protocol Corporate Accounting and Reporting Standard provides requirements and guidance for companies and other organizations to prepare a GHG emissions inventory (Greenhouse Gas Protocol, 2023a). Its objectives are to facilitate companies in preparing a GHG inventory that provides an accurate and fair account of their emissions through the use of standardized methods and principles (ibid.). Other objectives are to equip businesses with data that can be used to devise an effective plan to manage and mitigate GHG emissions, and to increase transparency and consistency in GHG accounting and reporting across diverse companies (ibid.).

ISO 14001

ISO 14001 defines the requirements for an environmental management system that an organization can be certified to (International Organization for Standardization, 2023). It maps out a framework that organizations can use to establish a productive environmental management system (ibid.). This standard is designed for all types of organizations, regardless of their field or sector, and can give assurance to both company management and employees, as well as external stakeholders, that environmental impact is being assessed and improved (ibid.). Additionally, other ISO standards concentrate on specific approaches such as audits, communications, labelling, and life cycle analysis, as well as environmental concerns such as climate change (ibid.).

Miljøfyrtårn

The most significant impact of Miljøfyrtårn concerns the design of the core product: environmental management certification, aimed at Norwegian companies (Miljøfyrtårn, 2023b). Miljøfyrtårn offers a certification tool and an effective environmental management system that helps businesses reduce their environmental impact, encourage green transformation, and increase competitiveness (Miljøfyrtårn, 2023a). They have industry-specific criteria for over 70 industries, ranging from banking to day-care (Miljøfyrtårn, 2023b). The criteria's themes are based on the common impact of many businesses: waste/reuse, work, environment, procurement, energy and transportation (ibid.).

Åpenhetsloven

The transparency Act (Åpenhetsloven) is a new law passed in Norway by Stortinget (the Norwegian parliament) that came into effect on 1st July, 2022 (Regjeringen, n.d.-b). The new law aims to promote companies' respect for fundamental human rights and decent working conditions and ensure public access to information (Regjeringen, n.d.-a, p. 6). The Transparency Act requires companies to provide information and conduct due diligence assessments that must be presented in a report (ibid.). This act is seen as a part of clear and harmonised requirements to safeguard the social responsibility of a growing number of companies, and to contribute to achieving the UN Sustainable Development Goals (ibid.). Alongside other measures, the act aims to contribute to Norway's efforts to achieve UN Sustainable Development Goals (SDGs) number 8 concerning decent work and economic growth, and goal number 12 concerning responsible consumption and production (ibid.), which is indirectly and directly dependent on the construction industry activities (Goubran, 2019). The importance of the requirements in the Transparency Act aligning with international legislation is emphasized (Regjeringen, n.d.-a), which can be linked to the CSRD that requires strict environmental reporting (EU, 2023).

2.3. Decision making

There is an increased pressure on construction firms to expand their responsibility from only focusing on economic performance to also include sustainability performance (M. Pagell and D. Gobeli, 2009, as cited in Afzal, 2017, p.203). Consequently, sustainability has introduced itself as an important agenda on the firm's strategic decision making (Afzal et al., 2017, p. 203). Harris (1998) defines decision making as the study of identifying and evaluating different options based on the values and preferences of the decision maker. Making a decision implies that there are multiple choices to be considered, and in such a case it is desired to identify as many genuine alternatives as possible as well as choosing the one that (1) has the best probability of success and/or effectiveness and (2) aligns best with our goals, values, desires etc (ibid.). There are many models of decision making (Turpin & Marais, 2004). People who have experience in quantitative analysis would typically be familiar with the process of rational decision making, such as Simon (1977)'s four-step decision model (ibid.). In Simon (1977)'s rational decision making model, four steps are outlined; *intelligence:* identifying occasions for making a decision, *design*: creating, developing and analysing potential courses of action, *choice:* selecting a specific course of action, and lastly *review:* evaluating past decisions (ibid.).

In a study conducted by Laing (2013), investment decisions were investigated through experiments using the Rational Decision Making Model. The study revealed that people tend to become risk-averse when presented with negative information (ibid.). This indicates that individuals are influenced by how information is presented to them (Kahneman & Tversky, 2000, as cited in Sumiyati & Suhaidar, 2020, p. 285).

2.3.1. Decision making for sustainable development

The decision making process is one of the most crucial aspects of a successful and sustainable company (Dziadosz & Aneta, 2016). Making the right choices is essential to enhance efficiency, increase economic impact and improve the workflow (ibid.). Sustainable development has been commonly linked to the so-called triple bottom line of economic-social-environmental balance (Sachs, 2012). Similarly, environmental decision making demands the integration intricate interactions between ecological, economic and social aspects (Antunes et al., 2006). Sustainable development decisions require the active participation and early involvement of all relevant stakeholders (ibid.).

To ensure that the decision making for sustainable development is effective and resource-efficient, methods of analysis, assessment and evaluation are necessary (Pope et al., 2004). These methods are referred to as sustainability assessment (SA) methods and can be used to evaluate and compare between competing technologies or development pathways (Lindfors, 2021, p. 1). SA methods can be defined as a method that assist decision makers in evaluating integrated nature-society on a global to local scale, with a focus on both short- and long-term perspectives (Ness et al., 2007). The aim is to assist them to determine which actions are necessary or unnecessary to achieve sustainability in society (ibid.). SA methods can be viewed as a process that transforms sustainability into an operational concept and enable it to be used within decision making processes (Halla et al., 2020, as cited in Lindfors, 2021, p.1).

2.3.2. Corporate decision making

It’s important to note that decision making occurs at every level of management, and concerns both the top management and the rest of the employees in the organization (Kozioł-Nadolna & Beyer, 2021, p. 2376). According to Kozioł-Nadolna and Beyer (2021, p. 2376), decisions can fall into three categories: strategic, tactical or operational, where strategic decisions are long-term and regards the direction and policy of the organization, while tactical decisions are medium-term and are aimed at implementing strategic decisions. Operational decisions, on the other hand, are made on a daily basis (ibid.). Each category of decision making results in

different output data in terms of quantity and quality, and therefore requires different approaches to problem-solving (Dziadosz & Aneta, 2016). In order to enhance the decision making process, there are utilized well-established methods and techniques that are widely available and provide additional arguments which support the adaptation of a particular solution (Dziadosz & Aneta, 2016, p. 111). The quality of an organization's decisions plays a critical role in determining its effectiveness (Gabriel & Obara, 2013, p. 78). Sound decision making leads to positive outcomes, while poor decision made due to insufficient or inaccurate information can lead to failure (ibid.) This is why decision making is a crucial factor that determines the success or failure of an organization (ibid). The following issues can be considered fundamental decision making issues in the construction industry; the selection of construction equipment, building materials and elements, building location, construction techniques, participants in the investment process, the choice of the contractor's tender strategy etc (Dziadosz & Aneta, 2016).

2.4. Corporate governance

Sustainability in corporate strategy involves monitoring the long-term growth, efficiency, performance, and competitiveness of the company by integrating economic, environmental, and social aspects into corporate management (Kocmanová et al., 2011). This brings us to the concept of governance, which refers to the process of decision making and the subsequent implementation (or non-implementation) of those decisions (Ali, 2015, p. 67; UNESCAP, n.d., p. 1). Good governance is not about making "correct" decisions, but about best possible processes for making those decisions (ibid.). The concept of efficiency within the framework of good governance also covers sustainable use of natural resources and safeguarding of the environment (UNESCAP, n.d.). Kavalíř (as cited in Kocmanová et al., 2011, p.544) describes corporate governance as a system that manages and controls companies. However, John and Senbet (1998) states that corporate governance focuses on the mechanism used by stakeholders to maintain control over corporate insiders and management to protect their interests. Corporate insiders, including professional managers and entrepreneurs, make critical decisions for the corporation (ibid.).

The fundamental principles of corporate governance include amongst others legitimacy, direction, performance, fairness, accountability, risk management and transparency (Shipley & Kovacs, 2008, p. 217). Corporate governance structure defines the allocation of rights and responsibilities among various participants such as shareholders, managers, boards, and

stakeholders, and establishes protocols and procedures for decision-making (Ho, 2005; OECD, 2004). The direction and decision making power of a company is primarily in the hands of its board, which makes it a crucial factor in determining the company's performance (Krechovská & Procházková, 2014). Boards of directors are responsible for governing their companies, while shareholders are responsible for appointing the directors and auditors and ensuring an appropriate governance structure is in place (Cadbury, 1992). The board is tasked with setting the company's strategic objectives, providing leadership to execute them, overseeing business management, and reporting to shareholders on their performance (ibid.).

Corporate governance and corporate sustainability are interlinked and essential for the continued operation of corporations, as argued by Aras and Crowther (2008, p. 444). According to Shrivastava & Addas (as cited in Munir et al., 2019, p.916), sound corporate governance can foster high sustainability performance. In the current business landscape, companies are striving more for sustainable performance by incorporating economic, social and environmental policies into their operations (ibid.). Arora & Dharwadkar (2011) highlight that corporate governance plays a crucial role in making effective decisions about proactive sustainability practices (Munir et al., 2019, p. 916). Sound corporate governance mechanism plays a significant role in ensuring that management practices align with the interest of both shareholders and stakeholders (ibid.).

2.4.1. Stakeholder pressure

Freeman (as cited in Spitzeck & Hansen, 2010, p.379) defines a stakeholder in an organization as "any group or individual who can affect or is affected by the achievement of the organization's objectives". Stakeholder governance has two essential dimensions; power and scope (ibid.). Power refers to the level of influence stakeholders have in corporate decision making processes (Burchell and Cook, 2006; Jonker and Nijhof, 2006; Burchell and Cook, 2008, as cited in Spitzeck & Hansen, 2010, p.380). Stakeholders' power can range from stakeholders having no voice at all (non-participation) to having the power to make decisions themselves (stakeholder power) (Arnstein, 1969, as cited in Spitzeck & Hansen, 2010, p.380). Scope on the other hand refers to the breadth of power stakeholders have in corporate decision making, which typically ranges from deciding on isolated local issues to making decisions that impact the overall business model of the organization (Jonker & Nijhof, 2006; Kaptein & Tulder, 2003; Money & Schepers, 2007, as cited in Spitzeck & Hansen, 2010, p.380).

In the analysis done by Spitzeck and Hansen (2010) in their article about stakeholders influence corporate decision making, they revealed a 3x5 matrix, where there were three different patterns of scope of stakeholder participation, increasing from operational issues, to a managerial and finally to a strategic level of interaction. The five different levels of power could be distinguished starting from a scenario where there is no evidence of stakeholder influence is provided to a final scenario where stakeholders are involved in corporate decision making (ibid.). In their research, the scope of participation at strategic level meant that stakeholders were involved in discussions about strategic issues such as business development, scenario planning and innovations (ibid.). At the highest level of stakeholder power – substantiated impact, stakeholders were granted significant influence on corporate decisions (ibid.). The majority of the examples presented in their study refer to businesses that offer customers a wide range of choices to design their products and services(ibid.). In their study, Spitzeck and Hansen (2010) discovered that the majority of stakeholder governance mechanism remained in the category of low scope and low power, where stakeholders have very limited influence in decision making, and only within operational and managerial scope.

In today's complex and sustainability-focused world, it is essential for both higher education institutions and companies to consider their relationship with their stakeholders at the strategic level (Filho & Brandli, 2016), since they have the power to influence the success or failure of their operations (Filho & Brandli, 2016). Collaboration with stakeholders can provide valuable knowledge that can help drive sustainable innovation, ultimately contributing to sustainable development (Ayuso et al., 2011; Filho & Brandli, 2016; Rhodes et al., 2014). In addition, involving stakeholders in environmental decision making can enhance the quality of decisions (Beierle, 2002). Therefore, companies recognize the importance of engaging their stakeholders in their activities (Filho & Brandli, 2016).

2.5.Eco-efficiency

Global trends and threats such as carbon emission, resource scarcity and climate change are all factors which result in the need of change of today's society, companies and institutions (Götze et al., 2019). Consequently, the need for tools to measure and evaluate sustainable development and energy- and resource-usage for firms is increasing (ibid.). Eco-efficiency, which brings together economic and environmental progress (Verfaillie & Bidwell, 2000), is one most popular tools that firms may use to measure this (Figge & Hahn, 2013).

Eco-efficiency is a term that can be described as a tool used for the integrated measurement of both corporate environmental- and financial-performance (Figge & Hahn, 2013). The concept is based upon the foundation that environmental resources are scarce. I.e., the resources relevant for eco-efficiency are non-infinite (ibid.). Consequently, firms must use the resources at the highest efficiency to reduce their environmental impact (ibid.).

The concept of eco-efficiency was first introduced by Schaltegger and Sturm in 1990, but it was not before one year later in 1991 that the World Business Council for Sustainable Development, also known as WBCSD, introduced it and made it more popularized for the rest of the world (Belem et al., 2021). However, Figge and Hahn (2013) argue that the concept was already used in the 1970s in multiple journals. Initially, the concept was intended to be a tool to help deliver economical beneficial and competitive goods and services to satisfy the demand from customers, while parallel focus on keeping the environmental impact, throughout the entire life cycle of the good or service, as low as possible (Belem et al., 2021).

Eco-efficiency is a tool that provides the relationship between the economic value and the environmental impact of a product, service or an organisation (Belem et al., 2021; Verfaillie & Bidwell, 2000). However, Belem et al. (2021) propose that eco-efficiency is not only a business concept, but may be employed at global, national and regional levels as a tool to provide more sustainable information on countries, cities and smaller regions.

The overall aim for the majority of business measurement systems is to collect and analyse internal performances and values, to aid managers in decision making (Verfaillie & Bidwell, 2000). Eco-efficiency is not an exception (Belem et al., 2021; Verfaillie & Bidwell, 2000) – however, there are both internal and external stakeholders which may be interested in the eco-efficiency performance of the organization (Götze et al., 2019; Verfaillie & Bidwell, 2000). Internally, management uses the eco-efficiency performance information for decision making (ibid.); set goals for the firm, establishing which products or services to improve upon, etc (Verfaillie & Bidwell, 2000). Furthermore, the board of directors may be interested in the performance regarding eco-efficiency and other sustainability performances in their strategic decision making (ibid.). Lastly, employees are interested in the eco-efficiency performance; which products or services, and how the employees may work to optimize the eco-efficiency (ibid.).

External stakeholders interested in the eco-efficiency of a firm, are however interested in the performance for different reasons; Investors and shareholders may look at the eco-efficiency

performances as an influence of the firm's financial value (Verfaillie & Bidwell, 2000), oftentimes included in the organization's sustainable report (Götze et al., 2019). Banking and insurers attempting to integrate sustainability in their financial lending decisions and identifying risks and challenges, may look at the eco-efficiency performances as a tool helping decision making (Verfaillie & Bidwell, 2000). Communities and consumers may be interested in the environmental impact of the firm or product that they consume (ibid.).

Consequently, management and users of eco-efficiency must keep all of these stakeholders in mind when reporting and publishing the eco-efficiency performances (Verfaillie & Bidwell, 2000). Identifying and reporting what the different stakeholders want, identifying risks of reporting it, and deciding if the firm should evaluate its performances against a benchmark are all key aspects the management must consider when reporting eco-efficiency (ibid.).

2.5.1. The formula

Eco-efficiency is a tool which connects the economic- and environmental-aspect of either an entire firm or simply just a product or service, with the goal of an overall reduction and overview of the environmental impact of the firm, or product and service provided (Verfaillie & Bidwell, 2000). In other words; Eco-efficiency is the product of the relationship between the economic value of either the firm or product/service, and its environmental impact. One of the most common way to calculate eco-efficiency, whether it be at firm-level or product-level, can be illustrated through the general formula shown below (Belem et al., 2021; Figge & Hahn, 2013; Nikolaou & Matrakoukas, 2016; Verfaillie & Bidwell, 2000);

$$Eco - Efficiency = \frac{Product\ or\ service\ economic\ value}{Environnmental\ impact}$$

By separating the formula into two components, we can understand that there are two ways to increase the eco-efficiency of a product/firm; increasing of the *product or service economic value* or decreasing the *environmental impact* of the product/firm (Hahn et al., 2010; Verfaillie & Bidwell, 2000). I.e., the eco-efficiency can be increased by either generating a higher financial value, such as net sales or price of product, or by decreasing the environmental impact the product/firm brings, such as reduction of materials used or reduction of emissions – all depended on the choice of indicators (ibid.).

To further understand the concept of eco-efficiency, the components of the formula will be more thoroughly explained. The numerator, i.e., "*Product or service economic value"*, represents the economic value aspect of the overall firm or product produced (Belem et al., 2021; Figge & Hahn, 2013; Götze et al., 2019; Verfaillie & Bidwell, 2000). The denominator, i.e., *"Environmental impact"* represents the economic impact of which the firm or product inflicts to the environment (ibid.). These two components, of which their relationship equals to the eco-efficiency, are commonly known as *indicators* (ibid.). Furthermore, Verfaillie & Bidwell (2000), as a result of a year-long study involving 22 different organizations from more than 10 sectors, conclude that the indicators can be split into two main groups; *Generally applicable* and *business specific;*

Generally applicable: Verfaillie & Bidwell (2000) define the first main group of indicators as generally applicable, and argue that these indicators are universally applicable for virtually all firms, regardless of sector and size. Even though the indicators may be applied for virtually all firms, the indicators might not be of equal quality for all firms. Followingly, Verfaillie & Bidwell (2000) present three criteria that a generally applicable indicator must satisfy:

1) The generally applicable indicator is directly connected to a global environmental problem or business value,
2) The indicator must be relevant and of meaning regarding virtually all firms and sectors, and
3) The methods and definitions for measurement of said indicator are established and accepted globally.

Examples of generally applicable indicators are *Quantity of goods produced, Value added* or *Net sales* for the economic value indicator (Burritt & Saka, 2006; Hahn et al., 2010; Verfaillie & Bidwell, 2000). However, the generally applicable indicators applies only for the economic value indicators, and not the environmental impact indicators (Verfaillie & Bidwell, 2000).

Business specific: Any indicator that do not satisfy these three criteria defines as business specific indicators (Verfaillie & Bidwell, 2000). These indicators are individually created and applied based on a specific firm or sector, and examples of business specific indicators are *Energy consumption, Materials consumption* or *Greenhouse gas emissions* for the environmental impact indicator (ibid.).

2.5.2. Benchmarking

Eco-efficiency aims to track performances, document existing progress and identify potential improvements of a firm or product (Verfaillie & Bidwell, 2000). To map the product or firm's performances, one must evaluate the eco-efficiency performance against a *benchmark* (ibid.). A benchmark is the eco-efficiency result of which firms evaluate their results against; is their firm's eco-efficiency results higher than the benchmark, then their performances are better than the benchmark (Figge & Hahn, 2013; Verfaillie & Bidwell, 2000).

Furthermore, Verfaillie and Bidwell (2000) address internal benchmarking versus external benchmarking; internal benchmarking is tracking and evaluating a firm's performances year-to-year, comparing the results against its own previous performances. External benchmarking is evaluating eco-efficiency performances across firms (ibid.). Comparing the different firms' eco-efficiency should only be done when the firms' deliver the same service or product (ibid.).

Evaluating a firm's eco-efficiency performance externally requires establishing of the benchmark - however, there are multiple ways of externally benchmarking; Setting the market average performance of eco-efficiency (Figge & Hahn, 2013; Hahn et al., 2010), the average eco-efficiency of the national economy of which the firm's operate (Hahn et al., 2010), and sector specific benchmarking are three ways to externally benchmark (Verfaillie & Bidwell, 2000). Additionally, Verfaillie & Bidwell (2000) emphasise on focusing on choosing the correct benchmark for your analysis, as it is the foundation of determining the explanatory power of the relative results.

2.5.3. Criticism and challenges of eco-efficiency

Although eco-efficiency is often highly regarded as a tool for managerial decision making in the environmental and sustainability context (Figge & Hahn, 2013), the concept is subject to criticism (Hahn et al., 2010). The eco-efficiency term is being used in multiple different ways – and consequently receiving criticism for the lack of consensus regarding a set definition of the concept (Burritt & Saka, 2006; Figge & Hahn, 2013; Huppes & Ishikawa, 2005). It is also discussed to what degree eco-efficiency as a concept has been implemented into the corporate sector (Cite et al., 2006; Marshall and Brown, 2003; as cited in Hahn et al., 2010). Moreover, the lack of clear definition results in the concept being a *"popular buzzword"* rather than a well-grounded and definitive term (McDonough and Braungart, 1998, as cited in Hahn et al., 2010).

The relative result of eco-efficiency should also be noted; improvements of eco-efficiency may stem from either improvements in the economic indicator, reduction of the environmental indicator – or a combination of both (Hahn et al., 2010; Verfaillie & Bidwell, 2000). Consequently, there is no guarantee that an enhancement of a corporate's eco-efficiency results in an absolute reduction of their environmental impact. Hahn et al. (2010) refer to a situation of which the corporate eco-efficiency is improved, but with an increase of environmental impact, as a *Rebound effect* – and highlight that if the goal of eco-efficiency in the corporate sector is to reduce environmental impact, then the absolute environmental impact must be addressed.

The core elements of the eco-efficiency concept are its two indicators - relating to economic and environmental values, measured in two different units (Verfaillie & Bidwell, 2000). Hahn et al. (2010) argue that two major issues follow the nature of these indicators; The way eco-efficiency is communicated as of today is foreign to the dominant culture in business. The concept is complex and hard to grasp, which imposes challenges for business decision makers. Secondly, due to the concept's two indicators, it does not show if the change in eco-efficiency is due to changes in the economic or environmental indicator (Hahn et al., 2010). Considering development of environmental strategies, eco-efficiency does not let management know how their environmental performance is (ibid). Hahn et al. (2010) conclude that these two issues for corporate eco-efficiency is an obstacle in the implementation of the concept as a guiding principle for businesses.

Benchmarking for eco-efficiency introduces some additional challenges and criticism. The process of benchmarking makes corporate eco-efficiency exposed to being evaluated with irrelevant references (Huppes & Ishikawa, 2005, as cited in Hahn et al., 2010). Verfaillie and Bidwell (2000) echo this by emphasising that comparing firms against each other should only happened when the firms operate in the same sector and deliver the same product or service.

Alongside any other quantitative analysis, the quality of eco-efficiency is depended on the quality of the data used (Verfaillie and Bidwell, 2000). Corporate financial measurement, reporting and data are highly standardised – however, this is not the case for environmental data (Figge & Hahn, 2013). Therefore, calculating eco-efficiency should only be considered whenever reliable data is available for the business (Verfaillie & Bidwell, 2000). Reporting of environmental data has its challenges, e.g., recycled materials may cause issues when allocating their emissions to a specific process or time (ibid.).

3. Methodology

This chapter is devoted to present- and explain our choice of methodological approach to retrieve and analyse data for the thesis. Chapter 2.1 introduces our research design and approach employed throughout the thesis. Subsequently, chapter 2.2 and 2.3 presents the research method and data collection process respectively. Chapter 2.4 elaborates the primary data collection process, by presenting the interview method. The next chapter is devoted to secondary data collection before the choices regarding research quality and ethical considerations are provided in the chapters 2.6 and 2.7, respectively.

3.1. Research design and approach

Research design is defined as the overall plan on how the researcher(s) will go about answering the research question(s) (Saunders et al., 2012, p. 159). The research design consists of transparent objectives and goals derived from the thesis' research question, and will either be the nature of *exploratory, descriptive, explanatory*, or a mix of these (Saunders et al., 2012, p. 160). Followingly, Saunders et al. (2012) explain exploratory research design as a study where the researcher sets open research questions to observe the results in order to receive insights regarding the subject. Descriptive design classifies as a study whenever the aim is to gain accurate information of events, situations or persons – reserved that information regarding the phenomenon is already thoroughly established (Saunders et al., 2012, p. 171). Lastly, explanatory research design is defined as studying and establishing the relationship of a set of variables (ibid.).

The choice of this thesis' research design was a result of its research question;

"*How is Norwegian construction firms' decision making for sustainable development, and how does this affect the eco-efficiency of the industry?"*

Consequently, we chose exploratory research design for this thesis, as it is the most appropriate design when the aim for the research is to establish new knowledge relevant for the research problem.

The degree of the researcher's knowledge regarding the subject influences the approach for collecting data and its analysis, and there is three main research approaches based upon the reasoning for the paper; deductive, inductive and abductive (Saunders et al., 2012, pp. 142-143). Saunders et al., (2012, p. 143) and Lukka and Modell (2017, pp. 42-43) agree on the

foundations of the three research approaches; if the research begins with a theoretical framework, often upon academic literature – and subsequently developing a research methodology- and question to verify said theory, then the approach is *deductive*. However, if the research commences by accumulating empirical data in order to investigate and analyse a phenomenon, and you create theory, e.g., conceptual framework, then the research approach is *inductive* (ibid.). Lastly, if the data collected is in order to explore a phenomenon, identifying themes and exploring patterns, then the approach is *abductive* (ibid.).

3.2. Research methods and data collection

Research can be described as the process of collecting and analysing data to investigate and understand a phenomenon. There are three common research methods: *quantitative, qualitative* and *mixed methods* (Saunders et al., 2012, p. 161; Williams, 2007, p. 65). Williams (2007, p. 65) further explains that the selection of method is based upon the type of data needed to best answer the research question. If the research question requires numerical data, the researcher will most likely choose quantitative research method (ibid.). For research questions requiring textural data, the researcher will most likely choose qualitative method (ibid.). Lastly, if the research question requires both numerical- and textual- data, then the researcher might use a mixed research method (ibid.). This is supported by Saunders et al., (2012), who summarize quantitative method as any data collection that uses or generates numerical data, qualitative method as any data collection that uses or generates non-numerical data, and mixed method when the collection uses or generates both types of data.

This thesis will focus on Norwegian construction firms' decision making for ESG and investigate the eco-efficiency in the construction sector. The challenges, problems and state of today's non-financial reporting will be a natural addition for the thesis, with qualitative data retrieved through interviews with players with different point of views. The data collected for the thesis is through both qualitative- and quantitative methods, i.e., a mixed data collection method (Saunders et al., 2012, p. 166; Williams, 2007, p. 65). The quantitative data collected to calculate the firms' eco-efficiency is collected from their annual- and sustainable reports, retrieved respectively from their websites. The data retrieved and used is *net sales* (Nok) and *CO2 emissions* (Tons). This will be covered in chapter 3.4., *Secondary data collection*. By sorting and ranking the firms by their eco-efficiency performance, we were able to decide which firms to include in the analysis – and which to not include. The investigation of net sales

and non-financial reporting will initiate our qualitative data collection, which will be through *semi-structured interviews*. This will be covered in chapter 3.3, *Primary data collection*.

3.3.Primary data collection

3.3.1. Interview method

Interviews are considered one of the most common methods of collecting qualitative data (Thagaard, 2018). Kvale and Brinkmann (2009) define the purpose of qualitative interviews as the ability to understand the opinions, views and knowledge of the interviewee. Through a qualitative interview the interviewer searches to understand the interviewee's point of view, through qualitative data communicated through ordinary words – and not through quantitative data, such as numbers (Kvale & Brinkmann, 2009, p. 49). Furthermore, the qualitative interview encourages the interviewees to describe their opinions and views as accurate as possible (ibid.).

The level of structure and formalization of the interview may vary – from standardized and highly structured questions in surveys, to more informal and unstructured interviews through conversation between the interviewer and interviewee (Saunders et al., 2012, p. 374). Furthermore, Saunders et al. (2012) present three categorises commonly used of interviews, each related to the of level formality and structure: Structured interviews, semi-structured interviews and unstructured interviews.

As for this thesis, we will retrieve qualitative data through semi-structured interviews, which is commonly used in accounting research (Khalifa & Mahama, 2017b, p. 323). Semi-structured interviews, also referred to as qualitative research interviews (King, 2004, as cited in Saunders et al. (2012), p. 374), are non-standardized interviews oftentimes guided by themes and key questions relevant to the research question (Khalifa & Mahama, 2017b, p. 323; Saunders et al., 2012, pp. 374-375). Conducting semi-structured interviews allows the interviewee and interviewer to generate data through a conversation about the subject, while remaining flexible enough to make adjustments throughout the interview (Khalifa & Mahama, 2017b, p. 323). To get the best response as possible from the interviewee, our pre-determined questions asked in the interview was open-ended, with low structure. This allowed the interviewee to present the answers and themes which he/she meant was most essential (Kvale & Brinkmann, 2009, p. 50). As the questions and themes was prepared in advance, it allowed us to be well prepared for the interview and create the opportunity to ask follow-up questions to the interviewee whenever it was needed (Kvale & Brinkmann, 2009, p. 151)

Table 1 below presents the conducted interviews for the thesis. As presented, we held a total of 8 interviews over the months of March and April 2023. Furthermore, the table show the length of the interviews, the interviewee's role, and the respective firm's size. For this thesis, we are using NHO (n.d.)'s definition for categorization of Norwegian firms' size: Any firm with 1-100 employees is categorized as small and medium size enterprises (SMEs). Consequently, every firm consisting of more than 100 employees is considered a large enterprise (NHO, n.d.).

Nr.	Firm size	Firm type	Role	Time	Length
A	SME	General contractor	Leader of HSE and quality	2023, March	44 min.
B	SME	General contractor	Administrative manager	2023, March	51 min.
C	Large	General contractor	Leader of HSE and HR	2023, March	42 min.
D	Large	General contractor	Director of sustainability	2023, March	49 min.
E	Large	General contractor	Manager of sustainability	2023, March	43 min.
F	Large	General contractor	Director of sustainability	2023, March	33 min.
G	Large	Environmental management certification organisation	Advisor of sustainable development	2023, April	42 min.
H	Large	Housing cooperative	Environmental project manager	2023, March	26 min.

Table 1: Overview of interviews

As table 1 presents, 4 of the firms interviewed are large general contractors (C-G), 2 of the firms are small general contractors (A & B), with the remaining 2 interviews being a Norwegian housing cooperative organisation, and a Norwegian environmental management certification organisation (E & F). By interviewing 4 large general contractors, which all, to some degree –

publish their sustainability report publicly, we are able to retrieve information regarding sustainability reporting, decision making, and their guidelines for sustainability. The two SMEs both published to some degree sustainable reports at their websites, but both less detailed than the larger contractor firms. The idea of interviewing both large and small- and medium contracting firms was to retrieve information of the differences and similarities across the different sizes.

The remaining two interviewees was affiliated with a large Norwegian housing cooperative and a Norwegian environmental management certification organisation. Conducting interviews with these interviewees let us investigate a different side of the construction industry. The interview with the housing cooperative allowed us to ask questions on how the firm as a major construction client communicated with and established environmental demands from subcontractors. Additionally, the housing cooperative interview let us understand how the construction client understood and perceived the Norwegian construction industry's focus and motivation for sustainable development.

Lastly, our aim regarding interviewing the Norwegian environmental management certification organisation was to further gain knowledge regarding Norwegian construction firms' focus, decision making and motivation for sustainability. The certification organisation representative was responsible for certification of Norwegian construction firms, and we hoped therefore that the interviewee withheld relevant information on the construction industry's decision making, guidelines, motivation and future for sustainability.

All of the conducted interviews were held digitally, as the interviewers was located at different geographical locations throughout the study. Therefore, it should be noted that non-physical interviews, such as digitally interviews, are often criticized; Kvale and Brinkmann (2009) and Saunders et al. (2012) criticize non-physical interviews by emphasising on the lack of body-language, as it may lead to challenges observing and interpret non-verbal language. This is supported by Khalifa and Mahama (2017b, p. 330), who highlight the importance of establishing personal contact between the interviewer and interviewee in order to create trust and encourage the interviewees to communicate comfortably. However, this may be more challenging when conducting digital interviews (Saunders et al., 2012, p. 404). Nevertheless, digitally held interviews also have its advantages; it allows the interviewee and interviewer to be at separate geographic locations, which removes the travel time and costs for the interviewer for getting to the interviewee's location (Kvale & Brinkmann, 2009, p. 160; Saunders et al.,

2012, p. 405; Thunberg & Arnell, 2022). Additionally, digitally held interviews using software, such as Zoom or Microsoft Teams, that allows both audio and video connection between the participants, may reduce the negative aspects of digitally held interviews (Thunberg & Arnell, 2022). Thunberg and Arnell (2022) follow up by arguing that interviews conducted digitally with both audio and video can provide data of as high quality as in-person interviews, and even adds that the interviewee may prefer digitally interviews, as it may feel more comfortable for the interviewee.

We believe that due to the COVID-19 pandemic, which lead to a vast number of digital meetings and interviews, most people are comfortable with digital interviews. As a result, we do believe that the quality of our digital interviews is of the same quality as if the interviews was held face-to-face.

3.3.2. Selection of companies and interviewees

As previously mentioned, our source of primary data is through semi-structured interviews. Table 1 presents the interviewees and their role at their respective firm. Through the process of finding said firms and interviewees, we found that *non-probability sampling* as the most relevant approach to find candidates appropriate for interviewing. Non-probability sampling is based upon a subjective selection of interviewees - in contrary to probability sampling, where the sample of interviewees are chosen at random (Saunders et al., 2012, p. 281). The research question(s) is often considered the reasoning for the size of the sampling, along limitations such as available resources and time (Patton, 2002, as citied in Saunders et al., 2012, p. 283).

As research question(s), limitations and scope of research vary from thesis to thesis, there are no set rules of sample size regarding non-probability sampling (Saunders et al., 2012, p. 283). Furthermore, Saunders et al. (2012) argue that the decision of sample size determines the best sampling technique – and not the other way around. As previously mentioned, this thesis will conduct semi-structured interviews, with - as table 1 shows, a sampling size of 8. This is in alignment with Saunders et al. (2012, p. 283), who claim that the minimum sample size for research utilizing semi-structured interviews is between 5 – 25 interviewees.

To create the best sample for semi-structure interviews, we separated the approach into two different processes; *1)* Identifying relevant firms, and *2)* identifying and approaching the employee(s) in respective firm possessing knowledge relevant for answering the research question. The processes are further explained as followed;

1) Identifying relevant firms: A list over the 100 largest construction firms in Norway was retrieved and the public information regarding sustainability and sustainability reports was analysed. Any firm who stood out was noted, and further investigated. A more in-depth explanation of this process is presented in chapter 3.4, *Secondary data collection*
2) Identifying and approaching the employees: As process 1) resulted in a list of interesting companies, the next step was to identify employees containing relevant knowledge and information for our research question. We found that employees and managers with the responsibility of sustainability and/or ESG was most relevant for our study. Examples of such are *Manager of sustainability, Director of sustainability* and *Leader of HSE and HR*, as presented in table 1. The contact information was retrieved through the firms' websites. We prioritized calling over e-mailing potential interviewees whenever their phone number was listed at their firm's website. However, the majority of individuals contacted through phone did not answer. Therefore, any individual who did not answer was followed up with an e-mail containing a presentation of us and the thesis, with the request of an interview.

This way of identifying and focusing on having a sample consisting of interviewees with a specific knowledge, is called *purposive sampling* (Khalifa & Mahama, 2017b, p. 330) A purposive sampling allows the researcher to explore the topic in depth, by retrieving professional knowledge on one specific subject from multiple samples, i.e., interviewees (Saunders et al., 2012, pp. 288-289).

3.3.3. The interview guide

As mentioned in chapter 3.3.1, *interview method*, our interviews were semi-structured. Semi-structured interviews are oftentimes guided by key themes and questions related to the research questions of the paper (Khalifa & Mahama, 2017b, p. 323; Saunders et al., 2012, pp. 374-375). To conduct a successful interview, the interviewer must be well prepared (ibid.). The level of knowledge of the subject for the interviewers are essential, in order to be able to develop key themes and questions for the interview (Saunders et al., 2012, p. 384).

To give ourselves the best possible chance of conducting successful interviews, we created an interview guide to facilitate a best possible result for both us and the interviewee. The guide consisted of a set of questions covering the themes of the thesis. In order to create as good interview questions as possible, the guide and its questions was created after a comprehensive literature review of the subjects. This allowed us to get a higher level knowledge of the themes,

which consequently let us create a set of questions of higher quality (Kvale & Brinkmann, 2009, p. 144; Saunders et al., 2012, p. 384).

To prepare the participant for the interview, the interview guide was sent to the participant ahead of the interview. This gave the participant the opportunity to get an overview over the themes which would be covered and would let them prepare for the interview (Saunders et al., 2012, p. 389). The first minutes of an interview are essential for the quality of the result. It might be the first time that the interviewee and interviewer meet, maybe in an unfamiliar setting (ibid.). As a result, it is essential for the interviewer shape the start of the conversation and create a good atmosphere (Khalifa & Mahama, 2017b, p. 330). To create a good atmosphere and initiate the interview, we started with short and easy questions. This is in alignment with Kvale and Brinkmann (2009, p. 146), who emphasise that the initiating questions should be specific and closed-ended. As a result, we opened the interviews with questions such as, "*What is your position at your firm?",* often followed up with "*How long have you been working at this firm?"*. The idea of opening with these short and specific questions was to let the interview have an easy start and to let the interviewee be a part of the conversation as early as possible.

For the remainder of the interviews, we tried to keep the questions clear and open-ended, as this can avoid bias and increase the reliability of the information retrieved through the (Easterby-Smith et al., 2008, as cited in Saunders et al., 2012, p. 389). This is in alignment with Khalifa and Mahama (2017b, p. 327), who add that open-ended questions allows for flexibility without compromising relevance of the subject. By asking open-ended questions such as "*How is the process of decision making for major decisions in your firm?"* and *"Why does you and your firm want to focus on sustainable development?"*, we allowed the interviewee to provide an extensive answer, formulated as the interviewee prefer (Saunders et al., 2012, p. 391). As the interviewee's answer was given, we set aside time to ask follow-up questions to the interviewee whenever it was needed.

As the interview was closing up, we made sure to ask the interviewee if they had anything more to add or any questions for us. To further improve our interview guide, we also asked if there were any questions lacking, or themes not covered good enough, at the end of the interview. Consequently, the interview guide was updated multiple times throughout the thesis – as a result of feedback from both the interviewees and us. The final version of the interview guide is presented in appendix A.

3.3.4. Recording, transcribing and analysing data

Since qualitative data is often depended on social interaction between two or more individuals, in our case through semi-structured interviews, it is considered more complex than quantitative data (Saunders et al., 2012, p. 546). Due to the nature of qualitative data, it is essential to analyse the data to fully understand and comprehend what the data translates to (ibid.). However, qualitative interviews generates a large quantity of data, resulting in the need of transforming the data to "findings" (Khalifa & Mahama, 2017b, p. 333). The form of qualitative data is through meanings formulated with words and not numbers, which imposes the risk of misunderstanding the meanings given (Saunders et al., 2012, p. 546).

To better collect the qualitative data retrieved through semi-structured interviews, we recorded all but one interviews with a recorder. To legally record any interviewee, we followed the Norwegian Centre for Research-data, more commonly referred to as NSD's demands. The NSD states that every interviewer needs to collect a consent from the interviewee (NSD, n.d.). Therefore, we sent an information-letter to every interviewee in advance of the interviews. The information-letter consisted of information of what the participation involved for the interviewee and what their rights are. Additionally, the letter was also used to collect consent from the interviewees. The information-letter used in this thesis is a template provided by NSD, and can be seen in appendix C. All but one interviewee consented to being recorded. For this interview, we focused on taking notes during and after the interview – trying to seize the opinions, meanings, and context of the interviewee. Making sure the notes was as detailed as possible allowed us to keep the data as authentic as possible (Messner et al., 2017, p. 438)

All the interviewees were ensured that they and their respective firm would be anonymized – both in advance of the interview, and after the interview was finished. The anonymization was a measure implemented to make sure the interviewee felt comfortable sharing their genuine experiences, thoughts and feelings (Ozdil et al., 2017, pp. 487-488). This is in alignment with Saunders et al. (2012, p. 231), who argue that the reliability of the data collected is enhanced whenever anonymization and confidentiality are guaranteed towards the interviewees.

The next step to analysing the meanings of the interviewee was to transcribe the interviews shortly after they were done. By transcribing the interview as soon as possible after the conducted interviews, we allowed ourselves to have the interview fresh in memory. This gave us the opportunity not only understand what was being said, but in what way the interviewee meant it (Saunders et al., 2012, p. 550). Although transcribing interviews is considered

extremely time-consuming (Hammond, 2017, p. 205), we chose to transcribe every interview - resulting in more than 70 pages of transcription data. We felt that by listening to and transcribing the conducted interviews, we increased our understanding of the interviewee's statements and meanings.

To further understand and organize the data, we identified categories of relevant themes by identifying connections within the data (Khalifa & Mahama, 2017b, p. 336). Followingly, relevant sections retrieved from the transcriptions was allocated into its respective category, giving us a more structured distribution of data. Saunders et al. (2012, p. 557) emphasise that this allows the researcher to rearrange the obtained data into categories, providing the researcher with a more consistent structure of data, which aids in further analysing the data. Relevant sections of the transcriptions were highlighted manually, withdrawn to an external document, and categorized into reoccurring themes and answers. This is in alignment with Saunders et al. (2012, p. 560) next step for analysing qualitative data, which focuses on recognising reoccurring themes and relationships, before developing relevant categories. Categories such as *"ESG KPIs", "Social responsibility"* ¸ *"Decision making process"* and "*Eco-efficiency"* were developed after discovering reoccurring trends from the interviewees. As the amount of data increased further into the thesis, correlating with the number of interviews conducted, we discovered that some of the categories were to broad – ending up attracting to much data for one category (Saunders et al., 2012, p. 560), e.g., the category *"ESG KPIs"* was subdivided into *"Environmental KPIs",* "*Social KPIs"* and "*Governance KPIs"*.

The entirety of the interviews was conducted in Norwegian. Therefore, the transcription was also done in Norwegian, with only the relevant sections included in the thesis translated to English. Said quotes and sections from the interviewees was then sent back to the interviewees to ensure factual accuracy (Saunders et al., 2012, p. 550; Yow, 2005, as cited in Hammond, 2017, p. 205) – in addition to allowing the interviewees to correct their own grammar or statements, removing or adding anything to their quotes.

3.4. Secondary data collection

Data that already have been collected for prior studies such as raw data or published journals or summaries, are commonly known as *secondary data* (Saunders et al., 2012, p. 304). Although primary data often is considered essential to answer the research question of a thesis, secondary data often also play a significant part – especially considering that the number of sources of secondary data have drastically increased alongside the rise of the internet (ibid.).

Secondary data may be both qualitative and quantitative, consisting of raw data; data which have had little to none processing, or compiled data; data which have received to some extent some kind of categorising or summarising to an extent (Saunders et al., 2012, p. 307). Furthermore, Saunders et al. (2012, pp. 307-313) introduce three categories of which secondary data may be characterized as; *1) Documentary data*: Data often used alongside primary data, may be in form of both text and non-text; *2) Survey-based data:* Data previously collected for another study through any kind of survey. Survey-based date is often retrieved in form of compiled data tables or tables of raw data, used for further secondary analysis; *3) Multiple-source data:* This is data compiled either from documentary data, survey-based or a combination of the two. The key condition is that the multiple-source data must have been combined in some way prior to the researcher retrieving it (ibid.).

Through this thesis, we have primarily retrieved and used multiple-source data as our secondary data. To analyse the Norwegian construction firms, we needed a baseline. Consequently, this thesis is based upon the Norwegian publisher and journal *Byggeindustrien*'s ranking of Norway's 100 largest construction firms for 2021 (Byggeindustrien, 2022). The construction firms are ranked by total revenue for 2021; from Veidekke ASA as the largest with a revenue of 37.592.000.000 NOK- to BMO Entreprenør AS being the smallest with a revenue of 450.000.000 NOK. With the list of Norway's 100 largest construction firms, the next step was to map which firms report and publish their non-financial data – including environmental and social data. This was done by manually investigating each firm's website, and checking for publicly published annual- and environmental reports.

3.5. Research quality

There are multiple ways to address and discuss the quality of the research conducted – one of which is what Saunders et al. (2012, pp. 380-381) identify as *the language of positivist tradition*; the potential data quality issues related to reliability, generalisability and validity, (Saunders et al., 2012, pp. 380-381). However, scholars argue that these issues of data quality are the assessment standards regarding quantitative– and not qualitative research (Ahrens & Chapman, 2006; Saunders et al., 2012, p. 382). When conducting quantitative research, the researcher often employs research instruments, such as surveys (Ahrens & Chapman, 2006, pp. 824-825). This does not apply for qualitative research – which are often based upon both structured and unstructured data (ibid.). One of the problems is consequently the question of replication of qualitative research, which may not be appropriate – as data retrieved through

qualitative methods such as interviews are social based, therefore context specific and depended (ibid.).

However, there are alternative methods for addressing and measuring the quality regarding qualitative data and research (Ahrens & Chapman, 2006, pp. 833-837; Saunders et al., 2012, p. 194). One of which is the patterns of causality, which Ahrens and Chapman (2006) emphasise that is of interest for both qualitative and positivistic research. Causality is defined by Saunders et al. (2012, p. 666) as "*The relationship between cause and effect. Everything that happens will have a cause, while each action will have an effect."* Plausibility – one out of two parts resulting in validation of research, is another aspect considering quality in qualitative research (Lukka & Modell, 2010). This is just some of the alternative methods for evaluating the quality of data and research (ibid.).

Producing qualitative research quality is challenging, and two of the challenges are ensuring and communicating the integrity of the researcher(s) empirical data, and to create and write up the empiricism such that the qualitative nature of the research is justified (Messner et al., 2017, p. 432). These challenges are referred to as issues regarding *credibility* and *authenticity* (ibid.). The following two subchapters will further discuss these issues for qualitative research, followed by how we faced these challenges throughout our thesis.

Credibility

Credibility is a matter of the plausibility of the theoretical analysis strength, as well as the strength of the empiricism (Lincoln and Guba, 1985, as cited in Messner et al., 2017, p. 433). Therefore, credibility is a term used to refer to what degree qualitative research is persuasive of its findings (ibid.). Messner et al. (2017, p. 433) emphasise that credibility is not only something that the researcher should focus on when presenting their findings, but throughout the entire study – when designing the research study, when collecting data, conducting interviews, and analysing its results. The process of influencing the credibility of our thesis started with the theoretical analysis and data collection (ibid.). Secondary data was retrieved through the official webpages of the relevant construction firms included in the analysis. By solely using official webpages owned by the respective firms, we were sure that the information published was legitimate and from a trustworthy source. The primary data was collected through semi-structured interviews with employees and managers from said firms. Saunders et al. (2012, p. 385) argue that credibility can be increased in research when conducting interviews by providing the interviewees with relevant information, often in form of a list of themes and

key questions, e.g., an interview guide, the researcher increases the credibility. As the interviewees received relevant information prior to the interviews, they are allowed to prepare for the themes relevant for the interview (Saunders et al., 2012, p. 385). Furthermore, we followed the recommendation of Saunders et al. (2012) for every interviewee, and sent the interview guide at least three days ahead of the scheduled interview. Moreover, the interviews were conducted with several organisations and actors in the industry, i.e., a *cross-sectional study* (Messner et al., 2017, p. 434). This is in alignment with Saunders et al. (2012, p. 190) who further explain that cross-sectional studies often suffer from time-constraints, which academic research projects often do. Additionally, Messner et al. (2017, p. 434) conclude that a cross-sectional study will often produce findings and research of higher credibility.

As presented initially, the second matter of credibility is the strength of the empiricism, i.e., how one presents the findings and communicating it to the reader (Messner et al., 2017, p. 433). As mentioned in earlier., any quote used in the thesis from the interviewees was sent back to the respective interviewee before implemented in our analysis. This ensured credibility of the quotes, by letting the interviewees edit the final transcriptions of their meanings (ibid.). Communicating the process of data collection may also help increase credibility, e.g., providing the reader an overview of interviewees, data collected or observations made (Messner et al., 2017, p. 436). As a result, we chose to present an overview over the interviews conducted, see table 1.

Authenticity

Another concern regarding the quality of qualitative research is its authenticity. Whether a study is authentic can be assessed by to what degree it skilfully uses the depth of empirical data, rather than abstract and cursory data (Golden-Biddle, Locke & Reay, 2006 as cited in Messner et al., 2017, p. 437). The topic of authenticity for qualitative research is considered important in two aspects: Authenticity may support the credibility of the study's findings – as it emphasises that the results of said study are based upon an in-depth literature review (Messner et al., 2017, p. 437). Secondly, authenticity is important in order to communicate the complexity of the study most efficiently in detail to the reader – both its findings and its empirics (ibid.). The level of authenticity is oftentimes depended on the research design of a study – with single case studies generally more detailed and richer than a cross-sectional study, as a result of time-restrictions and availability of data (ibid.). As with credibility, it is important

to consider authenticity throughout the entire study process; from collecting data to presentation of its findings (ibid.).

Messner et al. (2017, p. 438) present three techniques to increase the authenticity when conducting interviews; Asking the interviewees for specific examples to get an authentic response on what they are doing in their organisation. Secondly, conducting the interviews in the interviewee's native language is preferred, as the interviewee oftentimes share their meanings more nuancedly when speaking in their native language. Lastly, authenticity depends on the recording of data (notes, audio recording, etc.). The use of audio recording is preferred, as researchers can put all their focus on the content provided by the interviewees – preserving the highest level of authenticity possible (Messner et al., 2017, p. 438).

Coping with authenticity was considered throughout the entire research study. During the interviews, questions involving specific examples was asked the interviewees, such as: "*What standards and systems are being used for reporting sustainability, and how is this done on a daily basis?"*. As Norwegian is the native tongue of all of the interviewees, every interview was conducted in Norwegian. Lastly, to further enhance the authenticity, we used an audio-recorder in every interview.

3.6.Ethical considerations

Ethical considerations and concerns play a natural role in different parts of a research study – from designing and planning your research, collecting information, contacting and accessing organizations and individuals, to analysing and presenting your data (Ozdil et al., 2017, p. 484; Saunders et al., 2012, p. 226). Furthermore, Saunders et al. (2012, p. 226) define ethics as "*[…] the standards of behaviour that guide your conduct in relation to the rights of those who become the subject of your work, or are affected by it.*"; concluding that ethics considers any individual or organization which may be affected by your study in some way. This is in alignment with Ozdil et al. (2017, p. 484) who emphasise that the role of ethical considerations in qualitative research is to safeguard both human and non-human participants. To categorize ethical considerations, Saunders et al. (2012) present ten principles of ethical issues of which any researcher must recognise and address when conducting research. Throughout this subchapter we will introduce the most relevant principles for our study and present our response to them respectively.

Ensuring and providing the privacy of any subject taking part of the study is the first category relevant for our research, and Saunders et al. (2012, p 231) argue that this category is a key principle underpinning many of the other principles. One of which is the nature of voluntary participation and the participants' rights, i.e., the right to withdraw their consent and participation at any time and deciding to what degree and how they will be a part of the data collection (ibid.). This is supported by Khalifa and Mahama (2017a, p. 257), who define these issues as essential to consider when doing research. Furthermore, informed consent and ensuring confidentiality and anonymity are two additional relevant categories presented by Saunders et al. (2012, p. 231). An informed consent involves that the study's researcher(s) provides sufficient information and data towards the participants in advance of the participation, covering what their consent and participation mean and their rights (ibid.). To cover these ethical concerns presented by Saunders et al. (2012, p. 231), every interviewee received a document (consent form) informing them of all relevant information (see chapter x).

4. Empirical findings

This chapter is devoted to our empirical findings throughout our research. The findings present the foundation of data necessary for answering our research question:

How is Norwegian construction firms' decision making for sustainable development, and how does this affect the eco-efficiency of the industry?

This chapter is divided into three main sections; first, a presentation of the firms' relationship to ESG, followed by a description of the respondents' views of decision making for sustainability. Lastly, the eco-efficiency calculation with an alternative will be presented, followed by sustainable reporting and its challenges in the Norwegian construction industry.

4.1.ESG

Balancing E, S and G

In the past, most construction firms in the Norwegian market have prioritized health safety and environment more than other aspects of ESG. In the recent years there has been a development where the social aspect gets more attention. This has led to a better balance between the three aspects of ESG. Interviewee E quoted:

"Yes, I think we definitely focus on all aspects of ESG. Climate and the environment have been the main focus. And maybe that's the case for everyone else too, but over the last few years, the social aspect has also been increasingly demanded. Both among stakeholders and in projects."

This is echoed in a statement from interviewee F when asked if there were any areas within ESG that they focus more on:

"Yes, obviously climate and the environment. The construction industry is often referred to as the 40% industry, and our environmental efforts are very clear and strong. But we have also wanted to be clear that we want to balance that out with the social aspect of sustainability as well. So, we believe that we are actually investing in all three aspects of the concept."

Derived from this statement, we understand the commonly used term for the construction industry; the 40% industry. Naturally, the environmental aspect of the ESG have been prioritized historically. However, some respondents express a clear priority of the governance part of ESG, as stated by interviewee F:

"With corporate governance being a key aspect, we are clear about our corporate governance. We have our own compliance program, and of course, we are concerned with making money and want to use the resources we create to further develop our firm, and we believe that in itself is sustainable."

In the increasing priority of the social aspect, several new KPIs have been discovered. When asked about to what extent the firms focus on social initiatives, interviewee F quoted:

"Yes, to a very high extent. We have defined the HSE (Health, Safety, and Environment) as part of the social sustainability, linked to the goal of good health. Regarding gender equality, for example, we aim to increase the proportion of women and work towards gender balance [...] We will facilitate diversity."

More and more construction firms start to include ESG in their firm strategies. This can be exemplified by this answer from interviewee F when asked to what extent their firm focus on ESG:

"Yes, I would say that we focus on it to a very, very high extent. We launched a corporate strategy on January 1st, 2022, which will run until the end of 2027, and in that corporate strategy, we have elevated sustainability, or ESG, as a success criterion with all three aspects, both E, S, and G. This is closely aligned with the fact that sustainability is also anchored in our firm's values."

ESG and its KPIs

Most of the construction firms use the same sustainable KPIs (Key performance indicators). When asked what KPIs they use for measuring and evaluating sustainable development, interviewee E answered:

"Yes, there are quite a few of them. We have KPIs for our revenue and results. We track our fixed costs. We monitor our sick leave, H1 numbers, employee turnover, gender balance, greenhouse gas emissions, greenhouse gas reduction. We measure our waste sorting rate. And then we have some environmental aspects, such as fossil-free construction sites and the share of high-end sustainable projects. These are the things we report on today."

The different reporting standards used by the firms have influenced the chosen sustainable KPIs in the firms. This quote by interviewee B proved this:

"We have chosen KPIs that have largely been based on what could be reported on in the environmental certification Miljøfyrtårn. What could be measured there, such as waste and energy procurement and transport, and the fact that we have had KPIs within these four areas, including safety and HSE, were also sub-points originally. So, we have KPIs within each of these areas now."

It is not always easy to set a KPI for every area a firm is working on. Interviewee G provided useful insight, when stating:

"*One thing we can mention there is that there are many things related to the environment in the industry that are very important, but it is difficult to set KPIs for them. Often, what can be measured by KPIs may receive more attention than it deserves."*

From this quote, one can understand that there is a hardship within firms when it comes to setting KPIs for certain areas in the environment part of ESG, that can be important. Interviewee G insinuated that areas with already established KPI's often get more attention than areas which have not established it yet – even though these areas may be equally important. The reason for this can be that when you have KPIs that will be included in the sustainability reports, it can often be easy to be tempted to work more on that area with KPIs so those indicators will be good in those reports. In that process it is easy to ignore the other areas that do not have KPIs that also are important. We could also derive that if a firm do not have a KPI for an area within ESG, especially the environmental part, it doesn't necessarily indicate to no work being done. It may be because they do not have a good KPI on it right now, but they are trying to derive good KPIs for that specific area. This is exemplified by this quote by interviewee G:

"But something that will eventually enter a world with more reuse, it is even more difficult to set good KPIs. There are many national and international projects trying to come up with good KPIs for reuse. Regarding social KPIs, we currently do not have a purely measurable KPI for well-being [...] but of course, surveys are conducted, and we have measurements in employee interviews and occupational health surveys."

4.2. Decision making for sustainable development

4.2.1. The process

Our findings indicate that there is a crucial difference in the decision making process between the large firms and the medium to small firms. Generally, in the SMEs, the decision making

process is shorter, less complex and more direct compared to bigger firms. Interviewee A quoted:

"Yes, the distance is relatively short here, and that's what it's like being a small firm, I can knock on doors or send an email [...] The lines of communication are short. I've worked for larger companies where you feel like you're waiting for an answer from the seventh father in the house."

In the SMEs there are less employees involved, therefore making the decision making process simpler. This statement insinuates that often in big firms, one has to wait for the response of several people higher up with distant authority to make a decision. This waiting period can be a waste of time in terms of decision making time being delayed and possibly causing unnecessary stops in a project. In some of the bigger firms, the decision making concerning sustainability gets directly lifted to the top management. Interviewee F stated:

"Our firm is organized so that we have a small parent company at the top […], and then we have business areas underneath it, and the major business area is contracting. I would say that the primary decision making arena is either the management group in contracting, of which I am a part, or the corporate management group where the leaders of the four business areas meet. And there we have taken several sustainability decisions directly up to the corporate management group because they concern issues that affect the entire company group."

All the construction firms that were interviewed have at least one person in charge of HSE (Health, Safety and Environment), which construction firms associates with sustainability, according to the respondents. In the SMEs there are fewer people involved in the decision making process. Interview A stated: *"So we have, in a way, distributed the roles between me, who is responsible for HSE and purchasing manager."* When asked about who are responsible for the decision making, interviewee A answered: *"You can say that on a day-to-day basis, the CEO together with the purchasing manager and finance manager. They are the ones who, in a way, are responsible."* Interviewee B answered this to the same question:

"Some things must go to the board, as it is set up now, the board is of course the highest body and adopts the things that a board has to adopt. We have several bodies, we have the working environment committee, which is basically an advisory and discussion body who can quickly be involved. I mentioned the internal control group and professional development group"

This firm has allocated different responsibilities to internal groups within the company. These internal groups can be in charge of for instance, the control system, everything from administration to project management, to carrying out risk assessments etc. Interviewee B also stated:

"But you have a lot of daily decisions in the projects that perhaps have almost the biggest practical impact. For example, in the choice of solutions, purchasing, transport planning and waste management. There are many of us who are involved at each of our levels."

From this quote we can derive that all these internal groups are involved and part of the decision making process in the firm, in each of their own way. Even though some of the most important decisions are lifted up to the board, the majority of the everyday decision making are done by the different internal groups.

An important difference between the small and big firms, is that in the big firms, they have dedicated positions for sustainability in the company, e.g., a director of sustainability. Interviewee F stated:

"And then we have dedicated a position like mine to being overall responsible for sustainability and with me I have 9 talented colleagues in a separate sustainability team of 10 people. In addition, we have professional resources working on sustainability within the subsidiaries"

When a firm dedicates a position for sustainability it shows how sustainability is integrated into the firm's core strategy. By having positions dedicated to sustainable development, it can be more focused on, leading to improvements on the decision making process for sustainable development. It must be noted that the big firms have way more leeway due to having considerably more employees and higher turnover, so they can afford to dedicate such positions for sustainability. The SMEs on the other hand, who do not have many employees and as much turnover may not afford doing that.

Our findings suggest that top management of firms typically limit their involvement to strategic decision making. In some firms they also get involved at a detailed level. Interviewee E exemplified this when asked to what extent the top management involve itself in day-to-day decision making, they quoted:

"Yes, top management gets involved to a very, very large extent. Yes, maybe a little too much at a detailed level, but I feel to the very highest degree. […] they probably sit with both the CEO and a lot with the director in a very similar way."

This is not the case in another firm, where the top management gets involved but not at a detailed level. Interviewee F stated:

"Top management does not manage detailed decisions on a day-to-day basis, but they have been highly engaged in deciding the direction, determining the overall goals, and supporting the initiatives. […] There is a lot of commitment, great interest, but little detailed regulation."

Based on the obtained data from our respondents, we can assume that the CEO usually gets involved in everything that happens at the firm, including the decision making process for sustainable development. This is exemplified by this comment by interviewee A: *"So the top management: I would say that our CEO, he gets involved in the projects on a daily basis."* Most of the important decisions are raised to the top management in a firm. Interviewee E quoted. *"Yes, most of what happens is elevated to the top. […] But in a way, top management is quite well-rooted in everything that is going on."*

4.2.2. Stakeholder pressure

The environmental adjustment in firms may be explained as a result originating from pressure from stakeholders. When discussing the stakeholders' influence on the firms' business and environmental strategy, the respondents underlined a few actors; respondents A, B, E and H, all highlight the influence of the firms' owners. Interviewee A illustrates this clearly: *"We do have a board of course. Those who sit in the board are also our owners […]. They are the most important stakeholder."* Furthermore, stakeholders such as employees, the government through laws and regulations, as well as the construction client are all stakeholders repeatedly mentioned by the respondents. When asked to highlight the most relevant stakeholders, interviewee E summarizes: *"But, if we are to highlight three stakeholders, then I would say the construction client, the employees and the owner."* This quote illustrates the repetitive trend of some of the most important stakeholders.

There is however mentioned additional stakeholders; interviewee F expresses the increasingly focus on sustainability in the public as a relevant stakeholder: *"And then we obviously have the society that we are building in, which can be everything from an ordinary by-passer when you are building a school or a kindergarten, to a supervision authority."*

When asked to rank the stakeholders by the highest influence on their decision making, the importance of financial performance appeared by multiple respondents. Interviewee E emphasizes on the influence that the owners have on the firm:

"Our owners are very focused on sustainability, but they are crystal clear that if it is not financially beneficial – if we don't make money, then it will not exist any firm at all […] If your firm does not make money, then there is no sense in being sustainable either."

This statement is echoed by interviewee E, who when asked the same question concludes: *"It is difficult to say that any stakeholder is more important than other, but of course – whenever a stakeholder has an economic impact, then it is more important than others – that's just how it is."*

As mentioned there has been a movement towards sustainability among the stakeholders of construction firms, especially from the customers and owners. Interviewee C commented: "*It has now started with the customers focusing on the environment [...] There is a lot of focus on the environment from the customers."* This statement from interviewee E echoed this:

"Yes, I think a big part of it is, in a way, expectations from the owner, expectations from the industry. To be competitive... everyone is pushing for this. You can't just be left on the platform when the train is leaving."

This has resulted in the construction firms being pressurized into integrating ESG into not only their projects, but also their core firm strategies. Interviewee E stated: *"more and more clients are requesting the company's sustainability strategy, even outside of specific projects. It is definitely a focus we see increasing."* Today sustainable development is no longer a choice, but a necessity for the construction firms. This is echoed in a statement from Interviewee B:

"We believe that in order to exist in the future, one must deliver on sustainability, that's the short version. Whereas 15 years ago, it could be a competitive advantage and a badge of honour to have an environmental certification, now it's a matter of survival, we think, in the future."

To be able to win the tenders and get the contract in projects, construction firms must be able to deliver on the sustainability aspect. Interviewee C quoted:

"You are evaluated based on how well you answer and meet the sustainability goals that the customers have. So, if we want to win, let's say it's 60% on price and 40% on quality. If you miss on the quality, meaning you miss on the sustainability part, then you won't get the contract, so you can say it's a bit of a win or lose situation."

Some big firms motivate the employees to perform on sustainable development by having incentives and bonus schemes. The individual incentives can lead to an increased motivation amongst the employees. When asked to what extent ESG affect the company's business goals and if they have any incentives, Interviewee F answered:

"In a very high degree, we have incentives all the way down to bonuses, bonuses for both managers and almost all employees. [...] So we can say that everyone who is a manager has a bonus program where your bonus is also affected by ESG achievements, such as injury numbers, sorting, and quality delivery, and we believe that one of the most sustainable things a contractor does is to build correctly the first time."

The last sentence in this quote revealed a key principle in the construction industry. It is very important to build correctly the first time, by avoiding mistakes. This can first of all be very beneficial for the construction firm economically, but also in terms of sustainability. If additional construction work must be done, it will cause more waste and pollution, affecting the environment.

Two additional reasons for the construction firms to be sustainability certified was revealed when the interviewees were asked about what motivation and incentives construction contractors have for getting certified. Interviewee G stated:

"Some do it out of their own desire, either because of owners or employees - that it adds value to the business. Some do it for pure reputation, to be able to boast and show customers."

From this statement we understand that some firms certify themselves just for the sake of their reputation unfortunately - to have something to show potential customers. A sustainability certification may therefore add a value to the firm, as it may make the firm more desirable from the customers' point of view.

Often construction firms do not report CO_2 if the construction client doesn't require it. Now on the other hand there is a development amongst the construction clients where they demand more sustainability reporting, like for example CO_2 emissions. By requiring the firms to report it, more attention is given to ESG. When asked about the sustainability reporting in the Norwegian construction sector Interviewee G stated:

"It varies a lot - most firms that do not have requirements from a construction client, do not report their CO_2 numbers. But they can often offer it - it varies a bit on the service. My

perception is that some are starting to demand climate accounts in tenders. Especially in the public sector."

Continuation of the firms' focus and improvement on sustainable development influences the choice of sub-contractors. When asked if their firm set criteria when choosing sub-contractors, respondent F confidently states: *"A crystal clear yes, and to be picked as a sub-contractor for our firm you have to be pre-qualified […] and satisfy a set of pre-determined criteria."* However, interviewee A explains that the economic cost has previously been the only consideration when hiring sub-contractors: *"Before I started, the only thing considered when procuring was the economic cost".* However, our findings indicate that Norwegian construction firms does now also evaluate other components when choosing sub-contractors. This is also expressed by interviewee A: *"So it is now that you also investigate quality, presence of project management, HSE, quality control, and control over the construction site."* Furthermore, respondents D, E, F and H state that they either have environmental, social and/or criteria related to management for sub-contractors. Interviewee H, representing a major housing developer elaborates on their demands:

"Yes, we do set a lot of criteria regarding both environment and social aspects […] however, we do also set criteria - for example, as of now it is mandatory to account for greenhouse gas emissions on all projects […] on how to manage waste, there is a lot of criteria [..] and the Åpenhetsloven also does introduce more criteria for the sub-contractors."

As a construction client, respondent H illustrates that also these actors have criteria for choosing contractors. Our findings support this, as multiple respondents highlights that their firm passes on the construction client's criteria when choosing sub-contractors. This is stated clearly by interviewee C:

"We do have to continuate the criteria which they have in their contracts. So, if the construction client has criteria regarding something – this also applies to demands and expectations, then these will also apply to our sub-contractors."

4.3.Eco-efficiency

Throughout this subsection, the eco-efficiency results for the Norwegian construction industry will be presented. We start by introducing the firms included, followed by explaining the indicators used for the calculations and the benchmarking process. The primary data and

calculation of the firms' eco-efficiency will be presented before an alternative version will be suggested.

4.3.1. Calculation, indicators and benchmarking

Analysing the 100 largest construction firms (by revenue) in Norway gave an underwhelming result regarding environmental reporting; only 24 out of 100 stated that they measured and reported their CO_2 emissions. Two out of the 24 did not publicly share their emissions, but did however state that they did track emissions. After manually approaching and requesting the data regarding CO_2, one out of the two responded and provided the report. Additionally, we found two of the firms who publicly published their reports as non-relevant, as we did not classify their main operations, and therefore emissions, as directly relevant to construction (Plumbing and telecommunications firms). Consequently, this analysis is based upon the 20 Norwegian construction firms who we were able to retrieve both the economic- and environmental data necessary to calculate the eco-efficiency.

Calculation of eco-efficiency requires relevant economic- and environmental indicators. This thesis' calculations are conducted using *net sales* (K NOK) as the economic indicator and *CO_2 emissions* (Ton CO_2) as the environmental indicator, as illustrated below:

$$Eco - efficiency = \frac{Economic\ indicator}{Environmental\ indicator} = \frac{Net\ sales}{Ton\ CO2}$$

The data used for every economic- and environmental indicator are obtained from the respective firm's website and/or publicly published reports.

To map and evaluate the firms' performances against each other, we had to create a benchmark. This thesis used the average eco-efficiency performance of the firms included in the analysis as the benchmark.

The first eco-efficiency calculation covers every CO_2 emission reported by the firms, i.e., that is Scope 1, 2 & 3. However, table 2 illustrates the diversity and challenges of environmental reporting in the construction industry; five of the firms are multi-national operating firms, who report their emissions across all countries they operate in collectively, and not separately. Consequently, the eco-efficiency of these firms is calculated used economic- and environmental data based upon the multi-national group. One of the 20 firms did not measure their emissions during the year of 2021. Therefore, the eco-efficiency of this firm is calculated

using data measured throughout the year of 2022. Furthermore, nine of the firms did not include materials in their calculation of scope 3. Another two did not measure emissions relevant for scope 3, and therefore, did not publish any data for scope 3 at all. Additionally, one of the firms tracked their emissions through the Norwegian environmental standard Miljøfyrtårn, which does not define the scope of their emissions.

Table 2 introduces the 20 firms included in the analysis. The economic- and environmental indicators are presented, followed by the eco-efficiency of each firm. Lastly, table 2 presents the eco-efficiency benchmark, at 1,066.03.

Firm	Economic indicator: Net sales (k NOK)	Environmental indicator: CO_2 emissions (Ton)	Eco-efficiency
Acciona Construccion S.A (1)	28,725,200	2,457,317.00	11.69
AF Gruppen ASA (4)	27,867,000	45,570.00	611.52
Anlegg Øst Entreprenør (3)	556,000	2,548.70	218.15
Åsane Byggmesterforretning AS (2)	641,000	130.31	4,919.04
Backe AS (3)	4,255,000	1,086.00	3,918.05
Consto AS	8,087,000	1,771,459.00	4.57
Gjermundshaug AS	1,322,000	10,494.30	125.97
GK Gruppen AS (3)	5,786,000	7,123.00	812.30
Hæhre & Isachsen Gruppen AS (3)	4,566,000	22,865.00	199.69
HENT AS (3)	8,070,000	2,815.00	2,866.79
Implenia Norge (3)	1,835,000	3,604.00	509.16
J.I. Bygg AS (5)	978,000	325.99	3,000.09
Mesta AS (3)	5,346,000	23,500.00	227.49
NCC (1)	16,245,000	194,619.00	83.47
NRC Group ASA (1) (3)	5,957,000	12.058.00	494.03
Peab (1)	59,737,000	1,332,000.00	44.85
Roadworks AS (3)	2,491,000	2,877.00	865.83
Skanska AS (1)	146,442,000	1,957,000.00	74.83
Solid Gruppen AS (4)	946,000	412.58	2,292.89
Veidekke ASA	37,592,000	932,935.00	40.29
Benchmark			1,066.03

Table 2: Overview eco-efficiency: Scope 1, 2 & 3

(1) International group; Economic and environmental components cover the entirety of the group

(2) Results for 2021 not published; results for 2022 used.

(3) Excludes materials for Scope 3.

(4) Excludes Scope 3 overall.

(5) Miljøfyrtårn certified report

As table 2 shows, *Åsane Byggmesterforretning AS* scores the highest performance of eco-efficiency, at 4,919.04, followed by *Backe AS* and *J.I. Bygg AS* at 3,918.05 and 3,000.09, respectively. *Consto AS* was the lowest performer with an eco-efficiency performance of 4.57, followed by *Acciona Construccion S.A* and *Veidekke ASA* at 11.69 and 40.29, respectively. The difference between the best- and worst performer is eye-opening; *Åsane Byggmesterforretning AS*'s eco-efficiency is more than 1,000 times larger than *Consto AS*'s performance.

Figure 1 below presents an illustration of the eco-efficiency performances of the firms, where the Y-axis represents the eco-efficiency performances. The benchmark at 1,066.03 is shown with the highlighted black line. To best illustrate the diversity and differences of the performances, the graph's Y-axis is using a base-10 logarithmic scale.

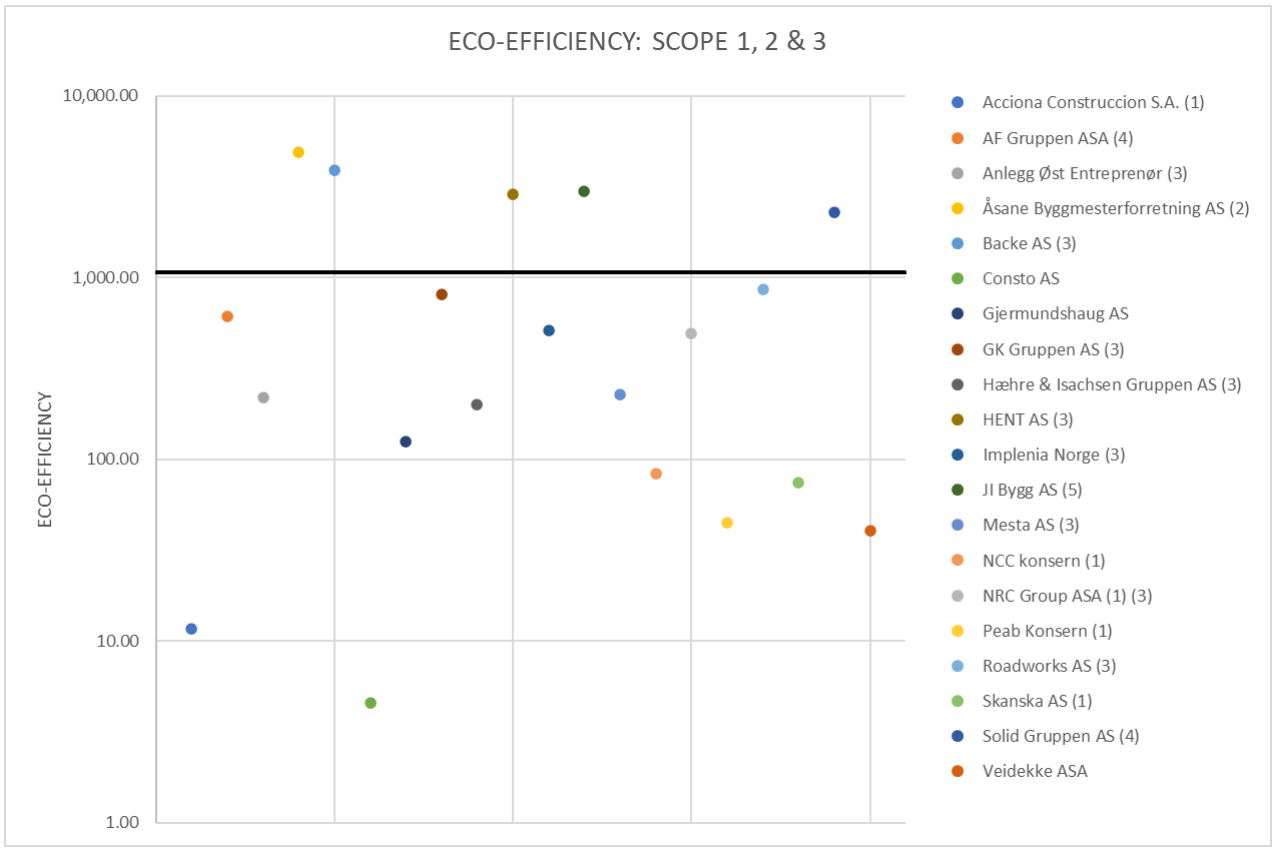

Figure 1: Overview eco-efficiency: Scope 1, 2 & 3

(1) International group; Economic and environmental components cover the entirety of the group

(2) Results for 2021 not published; results for 2022 used.

(3) Excludes materials for Scope 3.

(4) Excludes Scope 3 overall.

(5) Miljøfyrtårn certified report

4.3.2. Proposition of an alternative

As previously stated, the differences in eco-efficiency performance are significant. However, the differences can be a product of the vast structure variations of emission measurement by the firms. Therefore, the next section is devoted for proposing an alternative version of the eco-efficiency calculation.

To better map and evaluate the firms, the indicators must consist of the same data. As the previous subsection addresses, this is not the case for the first calculation of eco-efficiency. Significant differences in what emissions the firms measure and report, leads to inadequate results. Therefore, we propose an alternative version of the calculation; there are no differences on how the firms measure net sales, therefore the economic indicator stay unchanged. However, the differences in measuring and reporting emissions causes the need to change the environmental indicator. Consequently, the alternative environmental indicator is based upon a separate set of data – solely on the emissions originating from Scope 1 and 2, as all firm except one report these scopes. One firm reports through the Miljøfyrtårn standard, which does not specify what scope what emission originate from. Therefore, the respective firm have been excluded from this calculation.

Firm	Economic indicator: Net sales (k NOK)	Environmental indicator: CO_2 emissions (Ton)	Eco-efficiency
Acciona Construccion S.A (1)	28,725,200	172,792.00	166.24
AF Gruppen ASA	27,867,000	45,570.00	611.52
Anlegg Øst Entreprenør	556,000	2,098.00	265.01
Åsane Byggmesterforretning AS (2)	641,000	130.31	4,919.04
Backe AS	4,255,000	972.00	4,377.57
Consto AS	8,087,000	2,312.00	3,497.84
Gjermundshaug AS	1,322,000	5,402.00	244.72
GK Gruppen AS	5,786,000	7,123.00	812.30
Hæhre & Isachsen Gruppen AS	4,566,000	15,604.00	292.62
HENT AS	8,070,000	1,322.00	6,104.39
Implenia Norge	1,835,000	3,604.00	509.16
Mesta AS	5,346,000	20,800.00	257.02
NCC (1)	16,245,000	185,000.00	87.81
NRC Group ASA (1)	5,957,000	11,698.00	509.23
Peab (1)	59,737,000	232,000.00	257.49
Roadworks AS	2,491,000	2,795.00	891.23
Skanska AS (1)	146,442,000	229,000.00	639.48
Solid Gruppen AS	946,000	412.58	2,292.89
Veidekke ASA	37,592,000	81,290.00	462.44
Benchmark			1,431.47

Table 3: Overview alternative eco-efficiency: Scope 1 & 2

(1) International group; Economic and environmental components cover the entirety of the group

(2) Results for 2021 not published; results for 2022 used.

As table 3 presents, the eco-efficiency performances have changed; the top performers are now *HENT AS*, *Åsane Byggmesterforretning AS* and *Backe AS* with eco-efficiency results of 6,104.39, 4,919.04 and 4,377.57, respectively. The worst firms have also changed; *NCC* (87.81), *Acciona Construccion S.A* (166.24) and *Mesta AS* (257.02) are now the three worst

performers. As the eco-efficiency results have changed, the benchmark value has also changed. The benchmark is calculated identically as earlier, but now results at an eco-efficiency value of 1,431.47.

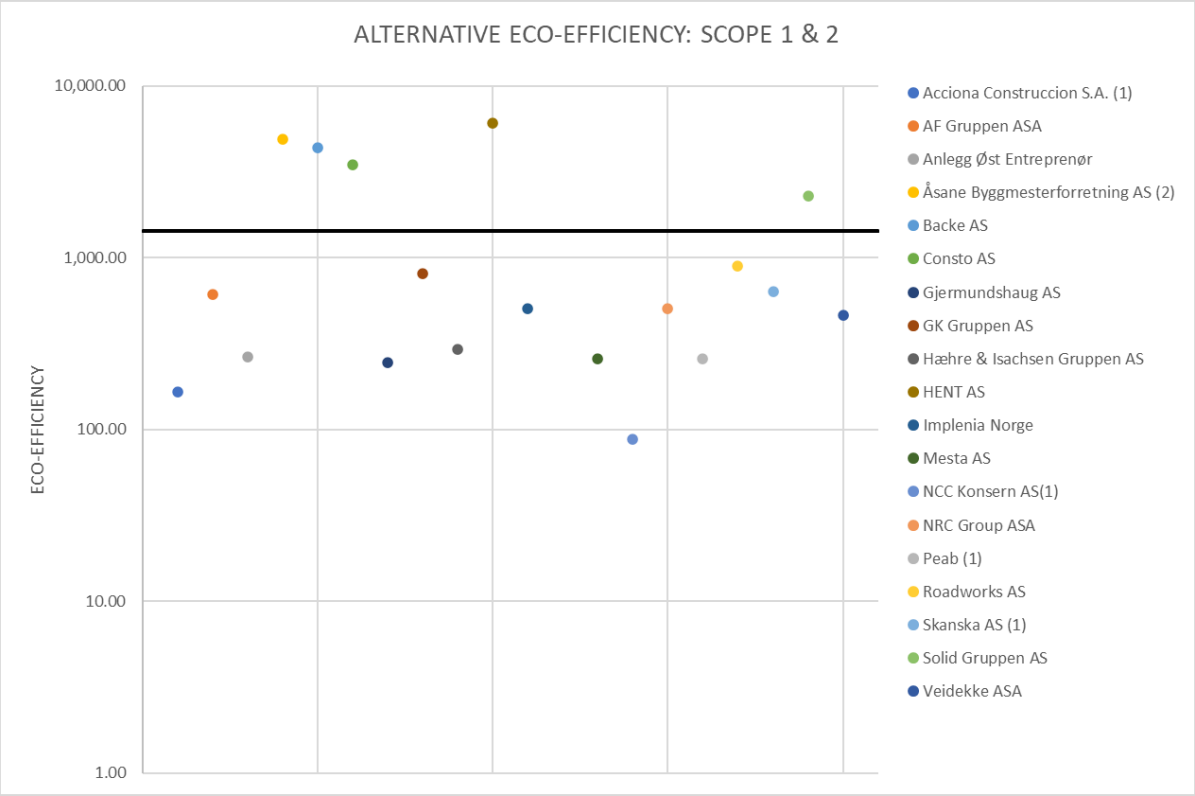

Figure 2: Alternative eco-efficiency: Scope 1 & 2.
(1) International group; Economic and environmental components cover the entirety of the group
(2) Results for 2021 not published; results for 2022 used.

Figure 2 above illustrates the eco-efficiency performances. Once again, the Y-axis is a base-10 logarithmic scale to better present the findings, and the benchmark is highlighted with the black line at 1,431.47. As both table 3 and figure 2 above present, the differences in eco-efficiency performance have decreased; the top performer's eco-efficiency, *HENT AS* at 6,104.39, is now 70 times larger than the worst performer's eco efficiency, *NCC* at 87.81.

Due to different results in eco-efficiency, it is important to highlight the importance of credible and accurate data, in order to conduct an adequate analysis. Therefore, the inconsistent measurement and reports in the Norwegian construction industry should be noted. The challenges and inconsistency of environmental reporting will be presented in the next section.

The alternative calculation is therefore our proposition to this issue. By eliminating the scope with inconsistent measurement and reports, the alternative is built on more representative data. Consequently, the alternative calculation presents a more accurate representation of the

Norwegian construction firms' eco-efficiency performance, compared to the original calculation. The challenges and inconsistency of environmental reporting will be presented in the next section.

4.3.3. Sustainable reporting and its challenges

The use of different sustainability standards and frameworks in the Norwegian construction industry causes challenges of comparison. First and foremost, consistency regarding measurement of CO_2 is one of the challenges. This section will present what the interviewees recognize as the frameworks used for environmental reporting in the Norwegian construction industry, followed by today's challenges for environmental measurement and its consequences for sustainable reporting.

Today, there are multiple voluntarily reporting standards used in the Norwegian construction industry. The interviewees recognize GRI, GHG and Miljøfyrtårn as three of the most common reporting frameworks. However, the interviewees' response illustrates that the framework employed reflects the size of the firm using it; interviewee A and B, both representing SMEs, state that they primarily use Miljøfyrtårn as their reporting framework.

On the other hand, interviewees C, D, E and F, all representing large general contractor firms, express that their firm are using other reporting frameworks; ISO 14001, GHG and/or GRI. Interviewee F illustrates this through the clear statement: *"And we've started to investigate if we should move towards the GRI […] but, it is definitely the GHG protocol that is the foundation on how we report our results."*

However, the variations in reporting frameworks and structures do however introduce some challenges. A firm reporting emissions through the Miljøfyrtårn framework, does not have to measure and report the same data as a firm reporting through GHG, or a firm following the GRI. Interviewee B presents an interesting statement regarding reporting through the Miljøfyrtårn framework:

"As of next year, we will probably be able to choose what we want to include in the sustainability report – we could probably do it this year as well, but we didn't because of the type of data we collected. You may, to a higher degree set your own goals in the Miljøfyrtårn report, if I understood it correctly. Until now, it has been kind of locked – we've reported the data that has been pre-determined in the Miljøfyrtårn standard regarding what needed to be measured and reported […] To summarize, the content of the Miljøfyrtårn report is based

strictly on what Miljøfyrtårn requests, but from now on we are more able to choose what we want to measure our firm based upon."

These non-defined requirements from the Miljøfyrtårn standards do however receive criticism from the participants representing firms using other standards. This is distinctly stated by interviewee E when presenting their own reporting standards: "*We are ISO 14001 certified. This is a standard we rank higher than Miljøfyrtårn […] I do believe that we don't need Miljøfyrtårn, as we already are miles above their criteria."* This criticism derives from a participant representing a larger firm not using the Miljøfyrtårn standard. However, interviewee B, representing a firm mobilizing the standard, also expresses their criticism about what the Miljøfyrtårn standard requires organizations to measure and to report: *"What I mean is, reporting on the paper-usage of the offices – that does not tell the story about the work we do, or where we should implement actions. That is emissions, right?"*

This is an observation which may be used as an argument to support the criticism of one of the reporting standards used in the construction industry. It must be mentioned that interviewee G emphasizes that the construction industry criteria for the Miljøfyrtårn standard is currently revisited:

"[…] there are eight different criteria regarding the construction industry. As mentioned earlier, there is an ongoing process of revising the criteria to two, instead of eight […] it is the construction industry's criteria turn to be revised – the criteria are revised by industry, and this time it was the construction industry criteria which is outdated and in need of updating. After all, this is an industry which evolves quickly."

Furthermore, environmental standards do not solely have the aim to measure and report environmental data. The implementation of standards, such as Miljøfyrtårn and ISO 14001, does additionally present a form of guarantee of environmental management knowledge and focus. Interviewee G emphasizes on this by stating:

"When you certify your head office, you show that you have the correct systems in place. You do have to certify the management and the system – and if it is in place at the office, it probably will be out in the field."

Interviewee G follows up on this statement by explaining the overall mission for an environmental standard, such as Miljøfyrtårn:

"Miljøfyrtårn's aim is not that every firm need to be certified, but that most firms have the opportunity to be better. What I mean is that Miljøfyrtårn does not have to be narrow and tough to get through, but work as a tool one can use to be better and show that you are working to improve. […] Continuous improvement is kind of the key word, and it is a lot more important than what numbers and statics that you are showing the world. It is so much more important to work with continuous improvement than what the exact number is on the report."

This statement regarding environmental standards and reporting is echoed by interviewee B, who presents another expression of environmental standards' missions:

"So, Miljøfyrtårn's most important function, I believe is not the sincere reporting – if you want to seriously do sustainable improvement, you cannot let yourselves be limited, but rather inspired. And this is where Miljøfyrtårn has made an adjustment for the industry, it gives us the resources to easier create evaluation-friendly data."

The freedom of choosing what to report that some standards offer, does however also receive some approval. Interviewee B highlights that using the Miljøfyrtårn standard puts them in the position to focus on the aspects of which they can improve on: *"And I do believe we then can prioritize more reasonable – focusing more on something that actually matters, regarding the real environmental impact."* Before the interviewee follows up with further praise of the standard: *"Miljøfyrtårn have been adapted and kind of been accepted as an equal to other environmental certifications, and eventually providing serious tools one can actually use."*

The majority of the respondents agreed that measuring and reporting environmental data has its challenges and limitations. Furthermore, the respondents highlighted that even though the construction industry is transitioning towards a more sustainable sector, there is still some significant problems in need for a solution. Interviewee F underlines the challenge of measuring sustainable data: *"We do see that we do not have sufficient ways of collecting data, as of now. But this is a matter we are working on – improving the environmental data collection*." This statement is supported by interviewee C, who states when asked difficulties about collection of accurate environmental data: *"Yes, and this is just because we do not have that opportunity as of now."*

Additionally, these opinions are in line with what the majority of the respondents' highlight; as of today, there is no way to accurately measure and report all environmental data in the construction industry. When confronted with examples of Norwegian construction firms who claim to measure and report every CO_2 emission from their projects, interviewee E is confident

in their opinions: "*I refuse to believe that (anonymized firm) do have a greenhouse gas report which covers all of their projects, and therefore have an overview over all of the materials used in their projects."* Furthermore, interviewee F echoes this, by stating:

"If you are thinking of a building – there is no one that afterwards can claim that they for an entire firm, have the footprint of what the plumber uses of materials. Whoever claiming such – it is just nonsense. Some may have some reference numbers, but exact data on this in order to be able to measure performances over time, it is just nonsense."

Environmental measurements standards and frameworks such as GHG allocates emissions in the scopes 1,2 and 3. As illustrated in chapter x, there is a significant inconsistency in measuring and allocating emissions to these scopes. Through the analysis, we found that scope 3 is without doubt the scope with highest inconsistency – and often ignored and excluded in the firms' measurements and reports. Scope 3, which in theory should include emissions originating from materials, is presented as a challenge by the respondents. Interviewee G illustrates this by stating: *"It does not exist any greenhouse gas report that presents absolutely every part of scope 3 yet, […]."* This is in alignment with respondent E's beliefs, who presents the structure for reporting in their firm:

"However, we kind of have chosen to not include materials in scope 3, because we do not have control over it. Therefore, we do not do a complete greenhouse gas accounting on all of our projects, and we are fully aware that we are lacking a significant part of scope 3 – it is however planned to include this in the future. For us, it is most important to have a legit greenhouse gas report which we can stand for. If we are going to reduce our emissions, we have to know where we are reducing emissions from."

Our findings shows that some firms do however choose to focus on the two remaining scopes. When asked about measurement of scope 3, multiple respondents ground their excluding of scope 3 due to not being able to accurately track emissions related to scope 3. Interviewee F emphasizes that their firm focus on improvement of scope 1 and 2: *"We have focused on scope 1 and scope 2 […], and the reason is that we want to be able to see the development of these scopes against the financial results*". The focus on the two first scopes is supported by other respondents. Respondent G expresses clearly their opinions on this subject:

"Yes, it is scope 3 which has the biggest emission out of these three scopes, but it also the scope you have the least possibility to impact. Scope 1 and 2 is where you should start with environmental management and with improving yourself. Afterwards, when you are finished

and satisfied with the improvement with scope 1 and 2, only then I think you should start to look towards scope 3."

Respondent G follows this statement by criticizing the existing opportunities of measuring the emissions related to scope 3:

"If it (scope 3) is based upon economic data, then the results are very, very rough, and should only be used to map how much emission is produced in a specific sector […] but, if you on business level track every EPD (Environmental Product Declaration) used, then you will get a more precise overview – however, there is ongoing professional discussions in the industry on how accurate these EPDs are."

This statement is echoed by interviewee A, who clearly presents their opinions on today's opportunity of tracking emissions: *"This is how it went this time (reporting of environmental data), because collection of data is not good enough for projects at construction sites."*

The issue of tracking emissions related to scope 3 is however only one of the main challenges for environmental reporting in the Norwegian construction industry. Our findings illustrate that the extra time and cost needed in order to accurately track emissions is of major concern for our respondents. Respondents D supports this, while respondent H adds their opinion*: "Yes, it is time consuming, because it needs more dedicated resources, and cooperation across departments internally."* Furthermore, interviewee G elaborates on how SMEs may face this reporting challenge the best:

"And the aspect that takes the biggest hit, is time. However, it is foundationally money that I think is the biggest problem for many. […], but if you do have a quality-system already going and working efficiently with this already, then the transition is naturally less demanding."

4.3.4. A future outlook on the construction industry

Measurement and reporting of environmental data in the construction industry is changing. Consequently, the firms' must also change their sustainability reporting. The respondents agree on that they need to increase their focus and time spent on environmental reporting, which interviewee H specifies: *"It is going to be time consuming with new standards and routines for reporting."* Respondent H mentioned another aspect which will affect the environmental reporting in the construction industry; new and stricter standards for environmental reporting. When asked about whether or not they are prepared for EU's taxonomy and the CSRD, the respondents expressed mixed feelings. Respondents A, D and H express a relative positivity

point of view for the oncoming changes, with respondent A stating: "*At the moment it seems that our existing structure of reporting is providing sufficient data in order to satisfy the taxonomy's criteria."* Furthermore, interviewee H praises EU's taxonomy and the incoming CSRD: *"Yes, we do wish these changes a warm welcome. We are pleased that stricter criteria are coming, and we find it positively that it is mandatory."*

However, some respondents expressed more negative feelings for the changes. Time-consuming, challenging and costly are some of the key trends the respondents highlight when asked about the future's reporting demands. When discussing the impact of the taxonomy and CSRD on SMEs, interviewee A expresses their concern: *"Yes, and they have to have better systems for reporting. Many firms do not have a systems as of today, so it is going to be interesting to see how the solve it. Everything is completely chaotic."* The concern for how the future reporting may impact small construction firms and sub-contractors is also expressed by interviewee E: "*What I believe is – I am more concerned about the SMEs which do not have the available resources to meet these criteria – because the criteria coming is pretty brutal."* However, interviewee F concludes the discussion regarding EU's taxonomy and CSRD inspiringly:

"It is a subject where we think that at a knowledge-level we could cooperate across firms, and then perform separately. But I do believe sharing knowledge regarding the topic benefits the entire Norwegian construction sector. And this is of course, call it voluntary work or for a community, must be in order to face the climate changes. And we as a large general contractor, have to step up and cooperate."

5. Discussion

In this chapter we discuss our key findings introduced in chapter 4 and discuss them against the backdrop of our theoretical resources.

5.1.ESG

Balancing E, S and G

ESG relates to how corporations integrate all three aspects, environmental, social and governance into their business model (Gillan et al., 2021). As an increasing number of construction firms begin to incorporate ESG practices into their operations, a question of how the Norwegian construction firms are balancing the three aspects as of today appeared relevant for further investigation. The construction industry is the primary contributor to of global greenhouse gas (GHG) emissions and plays a significant role in global warming (Hong et al., 2015). This led us to direct our attention to the environmental aspect by exploring the decision making for sustainability and calculating the eco-efficiency of some Norwegian construction firms.

The environmental aspect of ESG has been the central focus of the majority of Norwegian construction firms' ESG efforts in the past, based on the responses in the interviews. According to interviewee F, the construction industry is commonly known as the "*40% industry*", which corresponds well with existing theory illustrating that the construction industry contributed to almost 40% of the energy consumption and CO2 emissions in 2018 (International Energy Agency, 2019, p. 9). As a result, construction firms have traditionally placed a high priority on the environmental aspect.

However, interviewee F states that corporate governance (G) is a crucial aspect for the Norwegian construction industry and highlights their focus on being transparent regarding the business practices, revenues and usage of resources to further develop the firm. This is in line with Shipley and Kovacs (2008, p. 217) highlighting transparency as one of the fundamental principles of corporate governance. We argue that corporate governance is a natural aspect of running a business, as (John & Senbet, 1998) state that it is a mechanism used by stakeholders to maintain control over the management to protect their interest. Interviewee F followingly expresses their beliefs of focusing on corporate governance aspects in order to promote sustainable development in the firm, which we argue illustrates the growing understanding of the relationship between corporate governance and sustainability. Corporate

governance and corporate sustainability are interlinked and essential for the continued operation of corporations, as argued by Aras and Crowther (2008, p. 444). Shrivastava & Addas (as cited in Munir et al., 2019, p.916) argue that sound corporate governance can foster high sustainability performance.

In recent years, the focus on sustainable development has expanded to include the social, environmental, and economic dimensions, as reflected in the SDGs (Kanuri et al., 2016). Wieser et al. (2019) have emphasized the need to redevelop the construction sector to achieve the SDGs. Our research findings suggest that Norwegian construction firms have recognized this need, with stakeholders in projects demanding more attention to the social component of ESG, which has been previously underprioritized. The respondents highlighted that an increasing number of construction firms are striving to achieve a balance between the three aspects of ESG, with an increasing emphasis being placed on the social component. Our findings indicate that stakeholder pressure is the prime contributor to this. This pressure derives from the CSRD which will be applied from 2024 and the Transparency Act that came into effect last year, with both requiring more social responsibility (EU, 2023; Regjeringen, n.d.-b). Neglecting the social responsibility affects the business performance and sustainability, with recent examples showing that there are economic costs corresponding with ignoring social responsibility (Goel, 2010, as cited in Alhaddi, 2015, p.8). Overall, the response from the interviews illustrates that the firms recognize the downsides by neglecting the social aspect. In the construction firms, more work is put into this aspect with a growing number of social KPIs being used. Based on our findings we can conclude with stating that a growing number of construction firms in Norway are recognizing the significance of the social aspect, and consequently have implemented measures to integrate social responsibility into their operations to achieve a better balance between the three aspects of ESG.

Our findings indicate that an increasing number of construction firms in Norway are integrating ESG into their corporate strategy and seeking to invest in all three components of ESG. The respondents emphasize on their implementation of all three aspects of ESG as a success criterion into their corporate strategy, argumentative concluding in sustainability being anchored in the firms' values. We recognize the similarities between the firms' implementation of ESG in their strategy with Norway's enforcement of regulations regarding the Taxonomy and the application of CSRD coming in 2024 (NHO, 2023). We see the implementation of ESG into the Norwegian construction firm's corporate strategies as a preparation of the oncoming mandatory reporting requirements. The respondents express they feel they have to develop all

three aspects of ESG to be able to win contracts and to remain competitive in the construction industry that is changing.

ESG and its KPIs

Based on the responses of the interviewees, it can be concluded that the majority of Norwegian construction firms use largely the same key performance indicators (KPIs) for measuring ESG performance. Namely the firms studied use the following KPIs; revenue, results, gender balance, greenhouse gas emissions and reduction, waste sorting rate, sick leave, H1 numbers, to mention a few. We noticed from the response of the interviews that there were more KPIs regarding the economic and governance aspects, and fewer regarding the social aspect. Our findings in this regard are in line with Missimer et al. (2010) who state that the definition of social sustainability is less operational compared to other dimensions in the sustainability framework. However, several of the respondents pointed to more work being done in the social aspect in terms of improving it.

As CSR has emerged as an increasingly important agenda in the construction industry in recent years (Xia et al., 2018, p. 341), we must consider this in relation with our findings which show that construction firms have identified a few new social KPIs (Key Performance Indicators). According to Interviewee F, the longstanding focus on HSE (Health, Safety, and Environment) has been integrated into the concept of social responsibility, with the aim of achieving better health. The majority of the respondents highlighted the usage of the social KPI "proportion of women", facilitating gender equality and diversity. This correlates to the fact that the construction industry is heavily male dominated, as confirmed by the respondents. Several firms are pretty clear in the hiring process by having a minimum hiring percentage of women. Our results indicate that the number of social KPIs can without doubt be improved, but there are some important social KPIs already existing such as measurements of the well-being of the employees.

Interviewee G provides useful insight when stating that there are many things related to the environment in the industry that are very important, but it is difficult to set KPIs for them. This statement suggest that the construction firms face challenges in setting KPIs for certain environmental aspects of ESG that may be important. Followingly, the same respondent presented the example with reuse, where it becomes more challenging to establish effective KPIs for a future where reuse will be more prevalent, mentioning that various national and international projects are attempting to develop suitable KPIs for reuse. We argue that this is

in alignment with Verfaillie and Bidwell (2000), who underlines the challenges of allocating reused materials to a specific process. Reuse has become a crucial topic in the construction industry as there is a growing demand for construction materials to be able to be reused. This phenomenon can be attributed to the rapid growth of the global population and the consequent need for increased construction activities. An interesting find is the debate around attention to certain KPIs; some respondents underline that areas with well-established KPIs are more likely to receive more attention than areas without it. We argue that this is a true statement, as the reason for this may be that it is more tempting for firms to prioritize areas with well-established KPIs, as this can be well documented and included in the firm's sustainability report.

5.2.Decision making for sustainable development

5.2.1. The process

The choices of KPIs brings us to the important aspect of decision making in organizations. Our findings illustrate that there are examples where firms have several internal bodies that oversee the day-to-day decisions e.g., the control system, everything from administration to project management, to carrying out risk assessments. These daily decisions are operational decisions (Kozioł-Nadolna & Beyer, 2021, p. 2376). The fundamental decision making issues in the construction industry concerns the selection of construction equipment, building materials and elements, construction techniques, and choice of the contractor's tender strategy, etc. (Dziadosz & Aneta, 2016). The respondents stated that vital, long term decisions like contractor's tender strategy, which are strategic decision that regards the firms direction and policy (Kozioł-Nadolna & Beyer, 2021, p. 2376), gets lifted straight to the highest level because of the importance of those decisions.

Our findings suggest that decision making processes in SMEs are typically simpler and more direct due to the involvement of fewer individuals. The respondents stated that communication channels are shorter in SMEs compared to larger organizations where there may be delays in obtaining responses from higher authorities with more distant decision making power. This waiting time can be wasteful both in terms of projects possibly being delayed and can lead to consequences on the economic aspect of ESG. Followingly, the respondents indicate that the decision process on a daily basis in the SMEs, consists of the CEO meeting with the HSE-, purchasing- and finance manager. We argue that involving relatively few people make the decision process simpler and more direct, and can lead to effective decision making, also for sustainable development decisions.

Sustainable development decisions require the active participation of and early involvement of all the relevant stakeholders (Antunes et al., 2006). We recognize the recurrent trend in SMEs, where usually the CEO and top management gets involved in most of the decision making, which is also the case for sustainable development decisions. However, our results indicate that in larger firms, where there are more employees involved in the decision making process, sustainable development decisions are lifted directly to the top management from the start, which supports the statement of Antunes et al. (2006). Consequently, we conclude with stating that decision making for sustainable development is a vital part of the decision making framework in the construction firms today.

Engaging stakeholders in collaborative efforts can yield valuable insights that may drive sustainable innovation, ultimately contributing to sustainable development (Ayuso et al., 2011; Filho & Brandli, 2016). Moreover, involving stakeholders in environmental decision making can elevate the quality of decisions made (Beierle, 2002). Respondents in bigger firms confirms that they involve their employees, who are important stakeholders, in the decision making for sustainable development to a larger extent through having dedicated roles for sustainability. The respondents representing large firms state that their firm have designated sustainability teams, which shows their commitment and dedication for the cause. They believe it can elevate the quality of decisions and ultimately contributing to sustainable development. This supports Filho and Brandli (2016)'s claim that companies acknowledge the significance of engaging their stakeholders in their operations. It has to be noted that the bigger firms have more liberty to have these designated sustainability teams, due to having significantly more employees and turnover. This gives them the freedom to have such separated teams working with sustainability issues.

The respondents presented different structures and involvement from top management, which goes into the area of corporate governance, which gives a great deal of importance to the governing responsibility of the board of directors (Cadbury, 1992). Based on our findings, we can state that in SMEs and a few larger firms, there is high involvement from top management, interfering with day-to-day decision making, which Kozioł-Nadolna and Beyer (2021, p. 2376) define as operational decisions. In a majority of the large firms in our thesis, there is limited involvement from the top management, only deciding the strategy and determining the overall goals of the firm, which goes into the category of strategic decisions (Kozioł-Nadolna & Beyer, 2021, p. 2376). We argue that the involvement of top management can illustrate the firm's corporate governance to an extent; firms with high involvement from top management at a

detailed level oftentimes employ a more regulated form governance by the board of directors. We can conclude with arguing that our findings illustrate a difference of corporate governance in the Norwegian construction industry.

5.2.2. Stakeholder pressure

Many firms are committed to improving their sustainability practices and transparency due to this growing demand from the stakeholders (Afzal et al., 2017), with a stakeholder referring to any individual or group that can influence or be impacted by the organization's objectives (Freeman, 1984, as cited in Spitzeck & Hansen, 2010, p.379). This is in line with our findings which indicate that that the construction firms' stakeholders are now demanding more sustainable practices than earlier, as confirmed by interviewee C.

The respondents identified several key stakeholders which influences the firms' business- and environmental strategy. A reoccurring stakeholder was the owner of the firm; being the owner allows for making decisions that affect the entirety of the business model. Therefore, we argue that the owner has both a significant stakeholder power and scope (Burchell & Cook, 2006; Burchell & Cook, 2008; Jonker & Nijhof, 2006, as cited in Spitzeck & Hansen, 2010). Additionally, stakeholders such as the employees, the government through laws and regulations, and the construction client reoccurred as relevant stakeholders for the construction firms. We deduce from the interviews that the employees have the least amount of stakeholder power. However, some interviewees mention the communities as an important stakeholder; the increasing focus on sustainability from the communities influences the firms to focus on sustainable development, which relates to the concept of "creating shared value" in CSR, concerning value generation for other stakeholders and the society in general (The European Commission, 2011b).

However, when asked to identify the stakeholder with the highest level of power and scope, multiple respondents underlined the importance of economic impact; any stakeholder which has an economic impact on the firm automatically has a significant stakeholder power. Interviewee E emphasized this by illustrating that if the firm does not make money, then it will not be a firm at all, to be sustainable. Based on our findings, we can conclude with stating that the financial performance is one of the most fundamental aspects of any firm – including firms focusing on sustainable development.

We found it relevant to investigate the firms' motivation for sustainable development. Stakeholders are increasingly demanding more comprehensive disclosures from corporations

that go beyond economic performance to include both environmental and social practices (Waddock, 2003, as cited in Siew, 2015, p. 181). Our findings show that there is an increase in expectations from the owners, the industry and the construction clients to build more sustainable. This is in alignment with Afzal et al. (2017) who ground the improvement of sustainable development as a result of increasing demands from stakeholders and customers. Interviewee C confirms this by stating that there is an increased focus on the environment form the customers' perspective, with interviewee E underlining that as a firm you have to be competitive on sustainability in order to be a competitive organization. As a result, we argue that sustainable practices are heavily driven by the motivation of long term success, as a result of improved relationship and communication with the stakeholders (Afzal et al., 2017).

A measure for the firms to express their dedication for sustainable development are through sustainable certifications. However, according to interviewee B, an environmental certification used to be a competitive advantage and a badge of honour - but now it is rather an expectation from the stakeholders, and a measure to satisfy their environmental demands. Other respondents confirmed this and added that sustainability certification improve their reputation in the industry, which is supported by Lozano et al. (2016, p. 180) stating that sustainability reporting can enhance an organization's reputation. All the firms' interviewed had some sort of environmental certification – with varying degree of focus and resources placed in order towards achieving environmental, social and governance (ESG) goals to promote further sustainable development. This increasing demand from the stakeholders for sustainability has compelled the firms to incorporate ESG into their core business strategy. Exemplified by interviewee E, who revealed that an increasingly number of customers now investigate the construction firms' sustainable strategy when choosing the contractor. We argue that the increased interest from construction clients in the firms' environmental- and business strategy, as a strong motivation to strive towards sustainable development in the Norwegian construction sector.

Our findings show however that construction firms oftentimes do not report CO_2 emissions unless their customer requires them to do so. However, the respondents reveal that there is an increasing trend among customers and construction clients, especially in the public sector, to demand more environmental reporting, including CO_2 emissions.

Encouraging ESG performances within the company is essential to achieve the ESG goals set by the firm. Interviewee F revealed that their firm have individual incentives to motivate their

employees to focus and improve on sustainability; all the managers in the firm receive a bonus based upon their ESG performances. However, the Norwegian construction firms must also set demands and criteria towards the sub-contractors. Our findings show that this is essential in order to meet the firm's economic, environmental and social goals. The respondents illustrated the transformation of demands and criteria set towards the sub-contractors; from earlier only being evaluated by the economic aspect, to now being evaluated and chosen depended on economic, environmental and social aspects. We recognise the similarities of these demands with (Waddock, 2003, as cited in Siew, 2015, p. 181)'s observation of stakeholders increasingly seeking/demanding more comprehensive disclosures that go beyond a corporation's economic performance and include its environmental and social practices. The respondents stated that for them to be able to deliver on all three aspects and satisfy their stakeholders, they have to pass on the requirements to the sub-contractors, ensuring that there is sustainable practice throughout the entire supply chain. We recognize the connection between increased pressure from stakeholders and sustainable reporting instances such as the EU's taxonomy and CSRD, to the increased demands and criteria the Norwegian construction industry is inflicting towards their sub-contractors and supply chain.

5.3.Eco-efficiency

Verfaillie and Bidwell (2000) establish the concept of eco-efficiency as a tool providing the result of the relationship between an economic and environmental indicator. The authors place indicators into two groups; generally applicable and business specific, and we argue that our choice of indicators is in alignment with their definition of the groups. Our economic indicator, *net sales,* is in alignment with the definition of generally applicable indicator. Additionally, *net sales* is oftentimes exemplified as a generally applicable indicator (Burritt & Saka, 2006; Hahn et al., 2010; Verfaillie & Bidwell, 2000). However, our environmental indicator is not. Consequently, this indicator must be a business specific indicator according to Verfaillie and Bidwell (2000). Our choice of environmental indicator is *CO_2 emissions,* and we argue that this indicator does not satisfy the third criteria established by Verfaillie and Bidwell (2000) to define as a generally applicable indicator; *The methods of definitions for measurement of said indicator are established and accepted globally.*

Although voluntary environmental frameworks such as GRI and GHG are highly established and more or less accepted globally (Greenhouse Gas Protocol, 2023b; Kocmanová, Hřebíček, et al., 2011), we argue that our findings indicate otherwise. Through analysis of the included

firms' sustainability reports and data, we found that a majority of the firms measure and report environmental data, such as CO_2 emissions, non-identically. As both our empirical findings through interviews and the data analysis both prove, this is especially relevant for measurement and reporting of emissions belonging in Scope 3. The respondents support this statement, by highlighting the challenges of Scope 3, and multiple respondents claim that it is borderline impossible to accurately measure Scope 3, as of today. However, the respondents express an optimistic attitude towards the challenge, by emphasizing that their firm are continuously working on better and more accurately measurement of emissions relevant to Scope 3.

To evaluate the firms' eco-efficiency performance, we established a benchmark – the average of all firms. Evaluating the firms against each the firms' average is what Verfaillie and Bidwell (2000) define as an *external benchmark.* This benchmark is used in multiple eco-efficiency calculations (Figge & Hahn, 2013; Hahn et al., 2010), and allowed us to see how the firms was performing relative to each other. Additionally, as Verfaillie and Bidwell (2000) emphasise, the choice of benchmark is fundamental for the quality of the analysis, as it lays the foundation of evaluation of the firms. Therefore, we note that the extreme difference in performances makes the benchmark process subject for discussion; We argue that as there are a few performances that are significantly higher than the rest, the benchmark, i.e., the average of the firms' performances, is unnaturally high. Therefore, the evaluation of the firms' performance compared to the benchmark should only be done with this in mind.

Additionally, we argue that our calculation of the firms' eco-efficiency has its limitations. Due to the different reporting standards and frameworks used by the firms, there are a significant difference in what the firms measure and how. The firms' reports vary from including materials in Scope 3, excluding materials in Scope 3, to not reporting on Scope 3 at all. This is in alignment with Figge and Hahn (2013), who argue that corporate measurement of environmental data is not yet highly standardised. In addition, this statement is supported by multiple of our respondents, who separately explain the environmental data measurement decisions of their respective firm. Followingly, we argue that this is strengthened by the example of the firm who uses Miljøfyrtårn as their reporting framework - giving the firm the freedom of reporting KPIs of their own choice, confirmed by the respondents. As this firm does neither allocate their emissions to the different scopes or include every aspect of the two first scopes, we further support Figge and Hahn (2013)'s statement that measurement of environmental data is not yet sufficient standardised.

The investigation of the firms' environmental- and annual reports, leads us to concluding that it does exist a consensus regarding measurement and reporting of scope 1 and 2. Therefore, we faced Figge and Hahn (2013)'s concerns regarding differences in environmental measurement and reporting by excluding scope 3 entirely when performing the alternative eco-efficiency calculation. We argue that the alternative calculation results in higher quality than the original, as it is based upon more uniform measurement and reporting. Consequently, the alternative calculation illustrates more accurately the eco-efficiency of the Norwegian construction industry.

5.3.1. Comparison of the calculations

Table x below summarizes the eco-efficiency performances of the firms for both calculations. As previously explained, the first calculation is based upon every emissions reported by each firm, i.e., Scope 1,2 & 3, and any undefined CO_2 emission. The second calculation is however based on emissions allocated in scope 1 and 2, as this is the reoccurring emission categories from all but one firm.

Naturally, as both undefined and emissions related to scope 3 is excluded in the second calculation, any firm previously reporting these emissions has their eco-efficiency performance increased, as their environmental indicator has decreased (Hahn et al., 2010; Verfaillie & Bidwell, 2000). Consequently, as only the environmental indicator has been reduced and not the economic, there is no firm with decreasing eco-efficiency performance from the original calculation to the alternative. The change in eco-efficiency performance from the calculations is presented in the right column, *increase in %*.

Firm	Eco-efficiency: Scope 1, 2 & 3	Eco-efficiency: Scope 1 & 2	Increase in %
Acciona Construccion S.A (1)	11.69	166.24	1,322.12%
AF Gruppen ASA (4)	611.52	611.52	0.00%
Anlegg Øst Entreprenør (3)	218.15	265.01	21.48%
Åsane Byggmesterforretning AS (2)	4,919.04	4,919.04	0.00%
Backe AS (3)	3,918.95	4,377.57	11.73%
Consto AS	4.57	3,497.84	76,520.20%
Gjermundshaug AS	125.97	244.72	94.27%
GK Gruppen AS (3)	812.30	812.30	0.00%
Hæhre & Isachsen Gruppen AS (3)	199.69	292.62	46.53%
HENT AS (3)	2,866.79	6,104.39	112.93%
Implenia Norge (3)	509.16	509.16	0.00%
J.I. Bygg AS (5)	3,000.09	n/a	n/a
Mesta AS (3)	227.49	257.02	12.98%
NCC (1)	83.47	87.81	5.20%
NRC Group ASA (1) (3)	494.03	509.23	3.08%
Peab (1)	44.85	257.49	474.14%
Roadworks AS (3)	865.83	891.21	2.93%
Skanska AS (1)	74.83	639.48	754.59%
Solid Gruppen AS (4)	2,292.89	2,292.89	0.00%
Veidekke ASA	40.29	462.44	1,047.66%
Benchmark	1,066.03	1,431.47	34.28%

Table 4: Overview eco-efficiency comparison

(1) International group; Economic and environmental components cover the entirety of the group

(2) Results for 2021 not published; results for 2022 used.

(3) Excludes materials for Scope 3.

(4) Excludes Scope 3 overall.

(5) Miljøfyrtårn certified report

As table 4 above shows, the eco-efficiency performance changes spread from 0.00% to an increase of 76,520.20%. This result confirms our previous comments regarding environmental reporting; the construction firms' environmental measurement and reporting vary from including scope 3, to excluding materials in scope 3, to excluding scope 3 overall. Thus, the firms whose report exclude scope 3 have no change in their eco-efficiency performance from the calculations. However, firms which included the entirety of scope 3 (including materials), have a drastic improvement in eco-efficiency performance from in the alternative calculation (See *Consto AS*, table 4, figure 3). Firms which report scope 3 while excluding emissions related to materials have a lower increase in performance, relative to those who include these emissions. Figure 3 below illustrates the firms' eco-efficiency performances and their changes from the original- to the alternative calculation. *Benchmark 1* and *Benchmark 2* represents the two benchmarks for the original- and alternative calculations, with a score of 1,066.03 and 1,431.47, respectively. The benchmark is once again calculated as the average of the firms' performances. However, it should be noted that such a benchmark does not illustrate any performance on sustainability of the firms included in the analysis, but rather showing the leaders and stragglers (Figge & Hahn, 2013)

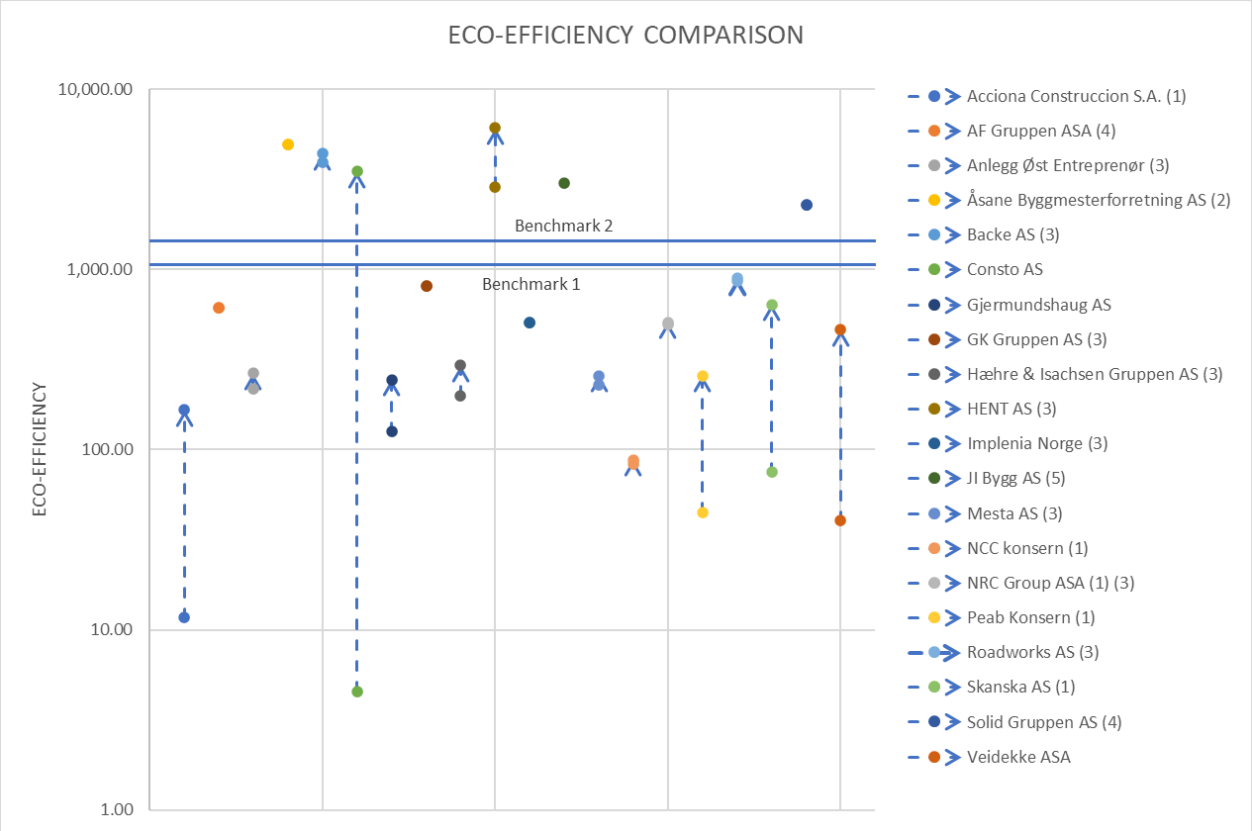

Figure 3: Eco-efficiency comparison

(1) International group; Economic and environmental components cover the entirety of the group

(2) Results for 2021 not published; results for 2022 used.

(3) Excludes materials for Scope 3.

(4) Excludes Scope 3 overall.

(5) Miljøfyrtårn certified report

Figure 3 illustrates the improvements in eco-efficiency performances. As previously, the Y-axis is a base-10 logarithmic scale representing the eco-efficiency performances. We argue that the figure illustrates our previous statements; *Acciona Construccion S.A, Consto AS, Peab, Skanska AS* and *Veidekke ASA*, all including materials in scope 3, have the most drastic increase in eco-efficiency performance.

The alternative calculation presents the performances based upon data measured and reported more uniform, as it excludes the scope 3. The figure illustrates the importance of having a reliable set of data, with the most extreme case with *Consto AS*, performing well below average at the original calculation, to well above average in the alternative calculation. Consequently, we conclude with arguing that the alternative calculation is preferred.

5.3.2. A future outlook on the construction industry

The shift in measurement and reporting of environmental data in the construction industry is by all expectations on the way (NHO, 2023), and the respondents had mixed feelings about these oncoming changes, i.e., EU's taxonomy and the CSRD. The shift in measurement and reporting of environmental data in the construction industry is by all expectations on the way (NHO, 2023), and the respondents were mixed in feelings regarding these oncoming changes, i.e., EU's taxonomy and the CSRD. Existing literature express that the practice of reporting corporation's sustainable goals and achievements has become more common (Afzal et al., 2017) , but we argue that our findings prove that the reporting has still a long way to go. Some respondents expressed negative views upon the changes, often emphasizing on the increased time and cost the new reporting will introduce. Multiple respondents also underline the challenge this will implement for SMEs, as they oftentimes do not have the time or resources as larger construction firms have.

Our findings indicate that the construction industry is getting prepared for the CSRD, by already starting to improve their environmental data collection. By requiring firms to report on the CO_2 metrics, we deduce that there is increased attention given to ESG - creating a stronger incentive for construction firms to prioritize sustainable development, to be able to cope with these requirements more easily.

Some of the respondents however, expressed positive views upon the changes the EU's taxonomy and CSRD will entail. These respondents did address the challenges of these changes, but highlighted that the changes in environmental measurement and reporting is happening for a reason. Nevertheless, we argue that the construction sector does not have a choice – the taxonomy and its increased reporting criteria are coming (Regjeringen, 2023). We highlight the respondent who illustrated a future where the firms of the Norwegian construction industry are cooperating to better face the taxonomy and CSRD, in order to make sure that both larger- and SME in the construction industry are able to satisfy the criteria. Hence, we argue that EU's taxonomy and the CSRD may be the tool the construction sector needs in order to face Figge and Hahn (2013)'s claims, being that measurement and reporting of environmental data is yet to be standardised.

6. Conclusion

This thesis has the aim of investigating Norwegian construction firms' decision making for sustainable development, and how these decisions impact the eco-efficiency performances of the industry. Therefore, this chapter is devoted to answering our research question, before presenting the thesis' limitations and suggestions for further research of the topic.

6.1. Decision making for sustainable development

To answer the research question *How is Norwegian construction firms' decision making for sustainable development, and how does this affect the eco-efficiency of the industry?*, we will present our main findings. Our findings indicate that the Norwegian construction firms' all focus on all aspects of ESG, and that it has been traditionally a prioritization of the environmental aspect of the term. However, our observations argue that the social aspect of ESG is more emphasized, leading to an increased balance of the ESG aspects in the industry. The firms' performances regarding ESG is measured through key KPIs. Our findings show that environmental and social KPIs are relatively well established and used, but have room for improvement. We argue however that ESG KPIs introduce an imbalance of prioritization of improvement; areas that are measurable with KPIs are prioritized above areas which does not have KPIs yet established. This is due to the firms being able to use these measurable KPIs in sustainable reporting, and increasing their environmental status.

The findings regarding decision making for sustainability are separated by the firms' size. SMEs' decision making is affected by the firms' size, making the decision making process and lines of communication shorter and faster than the larger firms. The decision making process for larger firms are more hierarchical, oftentimes requiring more employees. Additionally, decision making for sustainable development gets lifted directly to top management and the board of directors, corresponding with relevant literature.

Pressure from stakeholders is a major motivation for sustainable development. Our findings indicates that there are three major stakeholders: the construction client, the firm's owner and employees. There has been an increasing focus of sustainable development among the stakeholders, influencing the firms' business strategy. We argue that sustainable practice has become a requirement rather than a competitive advantage, due to stakeholder demands. The sustainable demands from the stakeholders are also affecting the sub-contractors, making smaller sub-contractors also focus on sustainable development and reporting.

6.2.Eco-efficiency

We argue that our findings support the criticism of the eco-efficiency concept. The quality of the indicators is heavily affected by the reliability and availability of data. The firms included in our thesis use different sustainability reporting frameworks and practices, giving them the freedom to measure and report environmental data of their choosing. Due to this difference in the reported data, our findings conclude that the environmental data is of relatively low reliability. Additionally, we argue that our first eco-efficiency calculation supports these statements, illustrating the vast difference in reported emissions. We argue that the alternative calculation presents an eco-efficiency calculation of higher quality, due to its' indicators being of higher reliability and availability. This calculation is based upon emissions allocated in scope 1 & 2, as this is data reported identically by all firms included in our analysis. Our findings show that the differences in performance in the two calculations further supports the emission reporting differences in todays' industry.

6.3.Limitations and further research

The thesis' scope and conducted analysis are affected by multiple limitations. Firstly, this thesis only includes construction firms operating in Norway. Firms operating in the EU or other countries are imposed to other legislations, which may affect the decision making and availability of environmental data. Additionally, even though the interviewees are representing difference actors of the industry, with different knowledge and point of views, it is difficult to claim that the findings can be generalized for the entirety of the Norwegian construction industry. However, we claim that conducting interviews with individuals with different positions representing different firms aids the thesis' credibility. Furthermore, as only 21 of the 100 largest construction firms publish their environmental data, there is a challenge claiming that our findings represent the entire sector.

For future research, we suggest to further investigate the inconsistency regarding measurement of Scope 3, which creates the most significant challenge for environmental reporting in today's construction industry. Furthermore, an analysis of the changes in decision making and procedures for sustainable reporting due to EU's taxonomy and the CSRD is of highly interest for further research, both in national- and international scope.

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Appendices

Appendix A: Interview guide (Translated to English)

Introduction

- Introduction of interviewers and thesis. Explain why interviewee was contacted.
- Introduction of interviewee; name, education, firm, position and responsibility in firm.

ESG

1. To what degree does your firm focus on ESG? Is it delegated specific positions with ESG work tasks?
    - What is focused on the ESG? Is it one or another that your firm specially focuses on? Why?
2. To what degree do you feel your firm focuses on sustainability development?
    - What specific goals and measures have been implemented?
    - What KPIs is used to measure and evaluate sustainability development?
3. To what degree does your firm focus on social responsibility?
    - What social KPIs is used?
    - What specific goals and measures have been implemented to improve these KPIs?
    - Potential follow-up questions on social data.
4. How is the decision making process for more significant decisions in the firm? And when considering ESG?
    - Who is included in the process- and who is responsible?
    - Which stakeholders influence the firm's regular- and ESG-strategy?
        - Which stakeholders influence the most, and how do you evaluate these?
        - What areas are the main focus of said influencers?
    - Do your firm set demands for choosing subcontractors? (Social and environmental)
        - If so, which, how and why?
    - Do you do any background check of the construction client?

        - To what degree are you able to influence the construction clients decisions?
    - To what degree does top management involve in the decision making on a day-to-day basis?
    - Is there any benchmarking that top management use to evaluate the firm's ESG performance?
        - Why are these benchmarks chosen?
    - To what degree does ESG influence the firm's business model? What are the incentives of these actions?
    - How often is ESG performances evaluated, and how does this influence the firm's strategic decision making?
    - Why does you and your firm focus increasingly on ESG?
        - What areas are the biggest influencers? (E.g., the firms' reputation, financial gains, stakeholder pressure, new legislations, meet customer criteria, etc.)

Eco-efficiency

1. Follow-up on annual- and environmental reports
    - What decisions have been made, and how was this process, for determining what should be included in the reports?
    - What reporting standards and frameworks are employed?
    - Why is something excluded from the report?
    - Potential comments on the eco-efficiency performance of the firm.

Closure

- Thank you for the interview.
- Anything we should change for any upcoming interviews?
- Any specific information and/or themes that you want to expand on?
- Requestion further potential data. (Reports, emissions, Miljøfyrtårn, etc.)

Appendix B: Interview guide (Norwegian)

Introduksjon

- Introduksjon av intervjuere og oppgaven. Forklare hvorfor intervjuobjekt ble kontaktet.
- Introduksjon av intervjuobjekt: Navn, bedrift, utdanning, stillingstittel og ansvarsområde.

ESG

1. Til hvilken grad fokuserer bedriften din på ESG? Er det delegert konkrete stillinger med konkrete ESG arbeidsoppgaver hos de ansatte?
    - Hva og hvorfor innen ESG fokuseres det mest på?
2. Til hvilken grad føler du at bedriften din fokuserer på bærekraftig utvikling?
    - Hvilke konkrete mål og tiltak er blitt gjort?
    - Hvilke KPI'er er i bruk for måling og evaluering av bærekraftig utvikling?
3. Til hvilken grad føler du at bedriften fokuserer på sosiale tiltak?
    - Hvilke sosiale KPI'er er i bruk?
        - Hvilke konkrete tiltak er gjort for å forbedre disse KPI'ene?
        - Eventuelle oppfølgingsspørsmål ved større avvik fra bransjegjennomsnitt.
4. Hvordan er prosessen for beslutningstaking for større avgjørelser i bedriften? Og med tanke på ESG?
    - Hvem er inkludert i prosessen- og hvem er ansvarlig for beslutningstaking?
    - Hvilke interessenter påvirker deres vanlige- og ESG-strategi?
        - Hvilke interessenter veier tyngst, og hvordan vurderer dere disse?
        - Hvilke områder er under størst påvirkning av interessentene?
    - Stiller dere krav til valg av underentreprenører?
        - Evt. Hvilke miljø- og sosiale krav stilles?
        - Blir det gjennomført noen bakgrunnssjekk av byggherrer dere velger å ta oppdrag for?
        - Til hvilken grad kan dere påvirke/argumentere mot byggherrens ønsker og valg?

- Til hvilken grad involverer toppledelsen seg i beslutningstaking på hverdagsbasis?
- Er det noen referansemålinger bedriften benytter seg av for å evaluere egne prestasjoner? Hvilke(n) og hvorfor?
- Til hvilken grad påvirker ESG bedriftens forretningsmodell? Hvilke insentiver finnes for dette?
- Hvor ofte evalueres ESG prestasjoner, og hvor ofte påvirker disse resultatene bedriftens beslutningstaking av strategi?
- Hvorfor ønsker du og bedriften å fokusere mer på ESG?
    - Hvilke faktorer utgjør størst påvirkning? (F.eks. selskapets renommé, økonomiske goder, press fra interessenter, nye lovgivninger, tilfredsstille klienter, osv.

Øko-effektivitet

1. Oppfølging av års- og bærekraftsrapport.

    - Hvilke valg- og hvordan er de kommet frem til, for hva som skal inkluderes i bærekraftsrapporten?
    - Hvilke rapporteringsstandarder benyttes?
    - Hvorfor ekskluderes noe fra rapporten? Er det en grunn til at rapporten ikke er publisert på nettet?
    - Eventuelle kommentarer på øko-effektiviteten til bedriften.

Avslutning

- Takk for intervjuet.
- Noe vi kunne gjort annerledes? Lagt til, evt. Fjernet?
- Noe konkret informasjon du føler er relevant som ikke er blitt sagt?
- Etterspørring av eventuell videre data (Rapporter, utslipp, Miljøfyrtårn-rapporter)

Appendix C: Information letter

Vil du delta i forskningsprosjektet

"Decision making for sustainable development"

Dette er et spørsmål til deg om å delta i et forskningsprosjekt hvor formålet er å undersøke og kartlegge beslutningstaking angående bærekraftig utvikling for høyt-scorende bedrifter av øko-effektivitet. I dette skrivet gir vi deg informasjon om målene for prosjektet og hva deltakelse vil innebære for deg.

Formål

Byggebransjen står for en betraktelig del av utslipp og klimapåvirkning, og står ovenfor store utfordringer og endringer i fremtiden. Det er allerede blitt strengere krav, regler og lover hva gjelder bærekraft, og flere er på vei. Denne masteroppgaven ønsker å undersøke og kartlegge hvordan noen av de mest *øko-effektive* (eco-efficiency) byggentreprenørene i Norge planlegger, beslutter og utfører bærekraftig utvikling. Oppgaven vil omhandle bærekraftig strategi, beslutningstaking, risiko, samt motivasjon for - og bidragsytere for bedriftens bærekraftige utvikling. Masteroppgavens overordnede forskerspørsmål er: "*How is Norwegian construction firms' decision making for sustainable development, and how does this affect the eco-efficiency of the industry?"*

Vi ønsker å gjennomføre et kvalitativt intervju fortløpende med estimert lengde på 45 minutter. Ved ønske om å motta forskningsprosjektet ved ferdigstillelse, kan det avtales gjennom kontakt med forfatterne. Eventuelle spørsmål og innspill henvendes til undertegnende med kontaktinformasjon nederst i skrivet.

Hvem er ansvarlig for forskningsprosjektet?

Handelshøyskolen ved Universitetet i Agder er ansvarlig for forskningsprosjektet. Førsteamanuensis Rafael Heinzelmann er intern veileder for prosjektet.

Hvorfor får du spørsmål om å delta?

Vi ønsker å undersøke og kartlegge hvordan bedrifter fostrer bærekraftig utvikling. Bakgrunnen for forespørselen stammer fra en kartlegging av norske byggentreprenørers øko-effektivitet (eco-efficiency) og ESG-fokus, hvor deres bedrift har prestert høyere enn bransjegjennomsnittet. Forespørsel om deltakelse vil bli utsendt til ansatte med overordnet ansvar for bærekraft og beslutningstaking i bedrifter som har prestert høyere hva gjelder gjennomsnittet av øko-effektivitet i byggebransjen. Respektiv kontaktinformasjon vil bli hentet fra bedriftens hjemmeside.

Hva innebærer det for deg å delta?

Ved ønske om å bidra til forskningsprosjektet vil du stille til intervju med undertegnede, hvorav estimert varighet er 45 minutter. Da forfatternes lokasjon kan avvike fra intervjuobjektets lokasjon, er det mulighet for å gjennomføre intervjuene digitalt. Det vil bli gjennomført lydopptak av intervjuet via sikker løsning for datainnsamling, levert av Nettskjema og Universitetet i Oslo. Ved ønske om å ikke bli tatt opp på lydopptak vil selvsagt undertegnede respektere dette og gjennomføre intervjuet uten opptak.

Eksempelvis kan spørsmål være: «*Hva er din rolle i bedriften, og hvordan påvirker bærekraft og ESG din arbeidshverdag?», «Til hvilken grad er økonomi en utgjørende faktor når dere diskuterer bærekraftig utvikling for bedriften?»* og *«Hvordan tilfører interessenter et press på ledelsen i bedriften til å bli mer bærekraftig?»*. Fullstendig intervjuguide vil bli overlevert intervjuobjektet før intervju, slik at det er mulighet for å forberede seg ved ønske om dette.

Det er frivillig å delta

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

Ditt personvern – hvordan vi oppbevarer og bruker dine opplysninger

Opplysninger innhentet om deg vil utelukkende bli brukt til formålet formidlet i dette skrivet. Behandlingen av opplysningene vil være konfidensielt og i henhold til personregelverket. Det er kun forskningsprosjektets forfattere som vil ha tilgang til dine opplysninger, og vil sikres ved diktafon levert av Nettskjema, utviklet av Universitetet i Oslo.

Hva skjer med personopplysningene dine når forskningsprosjektet avsluttes?

Samtlige opplysninger vil anonymiseres og alt innhold vedrørende lydopptaker vil slettes ved prosjektslutt, som d.d. er 19.05.2023.

Hva gir oss rett til å behandle opplysninger om deg?

Vi behandler opplysninger om deg basert på ditt samtykke.

På oppdrag av Universitetet i Agder har Sikt – Kunnskapssektorens tjenesteleverandør vurdert at behandlingen av personopplysninger i dette prosjektet er i samsvar med personregelverket.

Dine rettigheter

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

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

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

Olav Løvereide (948 94 944), Varakan Ananthakumar (401 48 901) eller veileder Rafael Heinzelmann (381 42 039). Personvernombud ved UiA kan kontaktes på personvernombud@uia.no.

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

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

Med vennlig hilsen,

Olav Løvereide	Varakan Ananthakumar	Rafael Heinzelmann
Masterstudent UiA	Masterstudent UiA	Førsteamanuensis ved UiA
Tlf.: 948 94 944	Tlf.: 401 48 901	Tlf.: 381 42 039

olavlo@student.uia.no varakana@student.uia.no Rafael.heinzelmann@uia.no

Samtykkeerklæring

Jeg har mottatt og forstått informasjonen om prosjektet *Decision making for sustainable development,* og har fått anledning til å stille spørsmål. Jeg samtykker til:

☐ å delta i et intervju

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

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(Signert av prosjektdeltaker, dato)