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MASTEROPPGÅVE

Sustainable innovation: an approach to the external-relation perspective and the triple bottom line.

Bærekraftig innovasjon: en tilnærming til det eksterne relasjons perspektivet og den tredelte bunnlinjen.

Ane Bjørk & Hanna Hestetun

Master of Science in Business

Faculty of Economics and Social Sciences/Department of Economics and Administration/ program

Supervisor: Parmita Saha

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Abstract

Sustainable innovation has experienced a significant increased interest. This results in greater demands for businesses. There is some literature on sustainable innovation, but little research has been conducted on the relationship between businesses' sustainable innovation practices from an external-relations perspective and its triple bottom line outcome. Therefore, we have decided to investigate sustainable innovation in industrial businesses. Our research questions are:

Why is it important for businesses to focus on sustainable innovation from an external relation perspective?

How does businesses implement process and policies to achieve sustainable innovation?

How does the sustainable innovativeness affect the companies' triple bottom line outcome?

The literature repeatedly presents the importance of focusing on the external-relation perspective, as well as the triple bottom line outcome. The empirical findings also provide an extension of the TBL, including technology and education.

In order to shed light on this matter, we used a qualitative approach, more specifically interviews. Our study included six interviews, consisting of two experts on the field and four interviews with industrial businesses.

Based on the literature and the findings, there is a relatively major focus on sustainable innovation among industrial businesses. The research reveals that it is important for industrial business to priorities sustainable innovation mainly due to the competitive advantage. In addition, a great pressure has been uncovered when it comes to the external-relations perspective. There is also a strong emphasis on the triple bottom line, mainly as a result of the economical and the environmental dimension, while the social dimension in place. Overall, to conclude, sustainable innovation is a necessity for the future of industrial companies.

Keywords:

Sustainable innovation	Industrial businesses	External-relation perspective	Triple bottom line
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Sammendrag

Bærekraftig innovasjon har opplevd en betydelig økt interesse. Dette gir økte krav til bedriftene. Det finnes en del litteratur om bærekraftig innovasjon, men lite forskning er utført på forholdet mellom bedrifters bærekraftige innovasjonspraksis fra et eksternt relasjonsperspektiv og dets tredelte bunnlinjeresultat. Derfor har vi bestemt oss for å undersøke bærekraftig innovasjon i industrielle virksomheter. Våre forskningsspørsmål er:

Hvorfor er det viktig for virksomheter å fokusere på bærekraftig innovasjon fra et eksternt relasjonsperspektiv?

Hvordan implementerer virksomheter prosesser og retningslinjer for å oppnå bærekraftig innovasjon?

Hvordan påvirker den bærekraftige innovasjonsevnen selskapenes trippelresultat?

Litteraturen viser gjentatte ganger viktigheten av å fokusere på det eksterne relasjonsperspektivet, så vel som det tredelte bunnlinjeresultatet. De empiriske funnene gir også en utvidelse av TBL, inkludert teknologi og utdanning.

For å belyse denne saken brukte vi en kvalitativ tilnærming, nærmere bestemt intervju. Vår studie inkluderte seks intervjuer, bestående av to eksperter på feltet og fire intervjuer med industribedrifter.

Basert på litteraturen og funnene er det relativt stort fokus på bærekraftig innovasjon blant industrivirksomheter. Forskingen viser at det er viktig for industrivirksomheter å prioritere bærekraftig innovasjon hovedsakelig på grunn av konkurransefortrinn. I tillegg er det avdekket et stort press når det gjelder det eksterne-relasjons perspektivet. Det blir også lagt stor vekt på den tredelte bunnlinjen, hovedsakelig som følge av den økonomiske og miljømessige dimensjonen, mens den sosiale dimensjonen er på plass. Totalt sett er bærekraftig innovasjon en nødvendighet for fremtiden til industribedrifter.

Stikkord:

Bærekraftig innovasjon	Industri bedrifter	Eksterne relasjons perspektivet	Den tredelte bunnlinjen
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Preface

This master's thesis is a final thesis on our two-year course in Master of Science in Business, with the specialization marketing and innovation, at the Western Norway University of Applied Sciences, Campus Sogndal.

After an extensive discussion within the group and with the guidance of our supervisor, we ultimately selected sustainable innovation as the focus of our research. More specifically, the relationship between businesses' sustainable innovation practices from an external-relations perspective and its triple bottom line outcome. This topic holds significant relevance and importance in today's society, and immediately captivated our interest. Our work on the master's thesis provided us with valuable insight and knowledge on sustainable innovation, ultimately leading us to develop a better understanding of the future of industrial businesses.

The master's thesis was challenging, exciting, and interesting. Over the course of the semester, we devote ourselves to this thesis with unwavering commitment. We met weekly at school to collaborate on this thesis, which steadily gained momentum. We take immense pride in the outcome of our labour, and our experience has afforded us deeper appreciation and interest in the field of sustainable innovation within industrial businesses.

Throughout the process of composing this thesis, various individuals have made a significant contribution to the final outcome. Therefore, it is only fair to acknowledge these individuals.

We would like to express our gratitude to each respondent who have utilized their important time to engaged in the interview. These respondents have provided valuable data for our master's thesis. Without these respondents, our thesis would not be completed.

Further, we would like to express our gratitude to Parmita Saha, our supervisor, for her outstanding guidance throughout this process.

Finally, we also want to express our appreciation to one another for our exceptional collaboration that ensued. Our collaboration was marked by many fruitful discussions and remarkable efforts, which resulted in the creation of a master's thesis that we take great pride in.

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1 Introduction

In this introductory chapter, we will present the background of the research area, justification of the selected topic, the purpose of the research, a discussion of our research problem and research questions, as well as highlighting the anticipated contributions and limitations of our thesis.

1.1 Background of the research area

“Like the IT and quality megatrends, sustainability will touch every function, every business line, every employee.” (Lubin & Esty, 2010, p. 50)

The environment has become a major focus in recent decades due to serious climate challenges, including global warming, ozone depletion, and pollution (WWF, 2022). The planet's increasing temperatures, caused by greenhouse gases and fossil fuel emissions, have resulted in natural disasters and will have devastating consequences if left unaddressed (Stuart et al., 2022). The Brundtland report of 1987 emphasized the necessity for change in the face of environmental issues, and “sustainable development” has since become a widely discussed concept that addresses environmental, social, and economic concerns. Originally, sustainable development is defined as “the development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (World Commission on Environment and Development, 1987). In other words, sustainability aims to balance economic growth with social and environmental concerns to ensure that resources are managed in a way that benefits current and future generations.

In the past two decades, businesses have become increasingly important in the sustainability discourse, this applies especially to huge corporations (Lozano, 2012). While businesses have a vital role in promoting sustainability, as well as addressing challenges such as climate change, resource depletion, and social inequality, they are frequently perceived as the main perpetrators behind these problems, which again leads to a severe lack of sustainability in society (Schaltegger & Wagner, 2011).

A line of business that face and share challenges when it comes to the environment is the industry. According to figures, oil, and gas production, along with industry, are the main causes of climate emissions in Norway. In the past, emissions from mainland industries have

been higher than those from the petroleum industry. However, due to the industry's emissions being drastically decreased, this has changed. In 2021, industry accounted for 24% of greenhouse gas emissions in Norway (Miljødirektoratet, 2022). In a report to the Ministry of Climate and the Environment, the Environment Directorate writes about green transition and the potential for emission cuts in industry, petroleum, and energy supply. The report concludes that the potential for climate solutions is large and will be an important knowledge base for the government's further work for a green industrial boost (Miljødepartementet, 2022). Due to this, industrial companies now feel more pressure and commitment to pursue more innovative work in an effort to improve sustainability.

1.2 Problem discussion

Over the past few decades, the sustainability discussion has increased. The concept of sustainability has gained an important place in today's society. It is evident that societies, governments, non-governmental organizations in addition to businesses organizations are focusing their attention to contribute in order achieve a more sustainable future (Wilkinson et al., 2001, Thakur & Gupta, 2012). This puts, among other things, existing companies under a lot of pressure.

The general pressure related to sustainability in companies has increased. This pressure is related to sustainable initiatives like measure, monitor and report sustainability performance (Cillo et al., 2019). Stakeholders such as customers, regulators, media, competitors and local communities have proven to account for a considerable piece of this pressure (Jakhar et al., 2020; Delmas & Toffel, 2008). This pressure from stakeholders on companies' sustainability initiatives includes government regulations, demands from customers, successful competitors, investors, and employee obligations (Melander, 2017; Shubham et al., 2018). Hence, it is obvious that companies cannot ignore sustainability (Lubin & Esty, 2010).

In order to achieve sustainable development in businesses, it is necessary to reduce environmental pollution, as well as managing one's own value chain and getting rid of unethical and illegal conditions (Saunila et al., 2018). Accordingly, both national and international businesses are currently experiencing significant changes.

Sustainability is a significant and expanding force behind business change (Seebode et al., 2012). Innovation aimed at sustainability can be a decisive driving force for realizing sustainable development (Nidumolu et. al., 2009). In the past decade, sustainable innovation

has experienced a significant rise in interest (Cillo et al., 2019; Boons et al., 2013). Earlier the focus has been on eco-innovation (Boons et al., 2013). However, sustainable innovation provides a potential path forward as businesses faces increased worries regarding resource depletion, environmental degradation, and social inequalities (Weidner et al., 2021). The definition of sustainable innovation is "innovations that improve sustainability performance." (Boons et. al, 2013, p. 2). This implies that innovation need to ensure not just a competitive advantage for businesses but also positive effects on the environment and the general welfare of society (Cillo et al., 2019; Carayannis et al., 2017; Del Giudice et al., 2011; Garcia & Calantone, 2002; Sharkie, 2003). Understanding how sustainability concerns and innovation practices might be reconciled is crucial given the growing importance of sustainability in innovation activities (Cillo et al., 2019; Bates et al., 2008).

1.2.1 Research problem and research questions

Given the growing importance of sustainable innovation, different perspectives on sustainable innovation have emerged. In existing literature, it is argued that there are three main perspectives that can be used to study sustainable innovation: internal-managerial perspective, external-relation perspective, and performance evaluation perspective. Although some literature has examined how businesses focus on the external-relation perspective, a crucial gap in this literature is how businesses implement processes and policies to achieve sustainable innovation (Cillo et al., 2019). The external-relation perspective focuses on how a company manages its external relations, with incorporating external stakeholder expectations as a crucial component (Alkemade & Suurs, 2012; Seuring & Gold, 2013; Cillo et al., 2019). Sustainable innovation aims to satisfy a wide range of stakeholders, just like traditional innovations (Parmar et al., 2010; Weidner et al., 2021). Hence, it is important to gain a better understanding of the relationship between businesses' sustainable innovation practices from an external-relations perspective.

Furthermore, there has not been much research done on the consequences of sustainable innovation. Another major research gap in terms of sustainable innovation is the triple bottom line which has not received enough attention (Weidner et al., 2021). In line with sustainable innovation the triple bottom line focuses on the economic, social, and environmental benefits (Elkington, 1997; Slaper & Hall, 2011). Since its introduction, this concept has generated a great deal of discussion. The concept has definitely landed in the business world, and many

companies have provided it great attention (Elkington, 2018). Therefore, it could be interesting to investigate if the adoption of sustainable innovation practices can lead to the achievement of the triple bottom line, resulting in economic, environmental, and social benefits for the company and in terms of the external-relation perspective.

As mentioned previously, it is a growing need for companies to address the phenomena of both sustainability and innovation. Interest in sustainable innovation has significantly increased during the last ten years (Cillo et al., 2019; Boons et al., 2013). Businesses, especially huge corporations, are thought to be the main contributors to environmental and social problems. Most of their activities have had a negative impact on the environment (Lozano, 2012, Schaltegger & Wagner, 2011, Thakur & Gupta, 2012). Our overall research problem identification of this thesis is therefore to gain a better understanding of the relationship between businesses' sustainable innovation practices from an external-relations perspective and its triple bottom line outcome. This overall research question of the thesis is very open and extensive. As a result, it is difficult to provide a specific response to this through research without first defining it. We have therefore chosen to break it down into three underlying research question. Accordingly, our research questions are:

Why is it important for businesses to focus on sustainable innovation from an external relation perspective?

How does businesses implement process and policies to achieve sustainable innovation?

How does the sustainable innovativeness affect the companies' triple bottom line outcome?

The purpose of this study is to address the gaps (*research objectives*) identified above. This means to gain a better understanding of 1) the relationship between businesses' sustainable innovation from an external-relations perspective; 2) as well as the implementation of processes and policies among businesses; and 3) if the adoption of sustainable innovation practices can lead to the achievement of the triple bottom line.

1.3 Expected contribution and limitation of the study

Our research questions consist of several elements, and we see it as appropriate to specify what we put into the various sub-areas, especially when it comes to "sustainable innovation". In addition, it is natural to set some limitation to this research objective.

Sustainable innovation has been more prevalent recently. This has improved our comprehension of how emerging technologies and societal practices enable more sustainable societies (Boons & Lüdeke-Freund, 2013). There are several definitions of the term sustainable innovation, and they all have in common to reduce the environmental footprint, either through reducing consumption or reducing/renewing process activities, while also working at reducing social inequalities (Carrillo-Hermosilla et al., 2010; Weidner et al., 2021).

The field of sustainable innovation is broad. Moreover, sustainable innovation can be divided into three categories: Internal-marginal perspective, External-relation perspective, and Performance evaluation perspective (Cillo et al., 2019). Due to the size of the topic, we have chosen to limit the scope of the task and will therefore take a closer look at the external-relation perspective. In short, this means businesses external relationships. This implies that businesses are integrated within a network of social and regulatory governance, value chains and socio-technical regime. As well as a link to the corporate strategy and that sustainable innovation systems are viewed as a process that involves not only innovative companies, but also a larger environment of institutions, infrastructures, and consumer behavior (Dodgson et al. 2013; Cillo et al., 2019). Another important aspect in this perspective is the inclusion of external stakeholders. There is no doubt that external stakeholders have expectations, thus it is critical to incorporate them in order to comprehend environmental and social actions for innovation (Alkemade & Suurs, 2012; Seuring & Gold, 2013; Cillo et al., 2019). In addition, Harrison and St. John (1996) stated that "Strategic decisions at all levels influence the importance of various stakeholders." (Harrison & St. John, 1996, p. 50)

Furthermore, we have decided to focus only on industrial businesses in Norway. But what really defines an industrial business? Industrial companies are mainly companies that process raw materials (Gram & Isaksen, 2023). In the EU business standard (NACE Rev. 2), industry or manufacturing is defined as

"(...) the physical or chemical transformation of materials, substances, or components into new products, even if the products are sold from the place where they are

produced. The term industry also includes the assembly of parts into finished products, recycling of waste, specialized maintenance and repair of industrial machinery as well as installation of industrial machinery and equipment" (Eurostat, 2008, p.112).

In Norway, the industrial sector is a major contributor to greenhouse gas emissions, accounting for 24% of total emissions in 2021 (Miljødirektoratet, 2022). With the aim of achieving a green transition, there is now a significant focus on developing sustainable products and technologies within the industry (Miljødepartementet, 2021). Therefore, it may be beneficial to examine how industrial businesses approach this transition to sustainable innovation.

The research will focus on Norwegian industries, including Hydro, Eramet, and Lerum, as well as experts. While some of these companies may have operations outside Norway, our focus and data collection efforts will primarily be directed towards their activities in Norway. By exploring Norwegian industries, this study will contribute with a better understanding of the relationship between industrial businesses' sustainable innovation practices from an external-relations perspective and their achievement of the triple bottom line. Also, by including experts, they will provide an extension to the study. Specifically, the implementation of processes and policies in achieving sustainable innovation in industrial companies.

1.4 Structure

The first chapter of the thesis is an introductory chapter, where the theme, problem and delimitation are presented. In chapter 2, we present the theoretical framework in depth. In order to better comprehend the relationship between businesses' sustainable innovation practices from an external-relation perspective, and the triple bottom line outcome, different terminologies and concept will be provided here. At the end of the chapter, we present and discuss our conceptual framework. Furthermore, in chapters 3, we discuss our research methods and the direction in which we have decided to take this thesis. This includes choice of research approach, data collection, as well as methods for data analysis. This chapter ends with a discussion about the quality of the research. Chapter 4 contains our findings from our data collection. Moreover, in chapter 5 discussion and implications will be reviewed. Here, the findings from the data collection are discussed against the theoretical framework. Lastly,

in chapter 6 we conclude the discussion from the preceding chapter, before outlining the limitation in this research and making suggestions for future research.



Figure 1: Structure of the thesis

2 Literature Review

In this chapter, we provide a theoretical framework with the intention of reviewing existing theory in order to develop theoretical knowledge relevant to the phenomena we intend to explore.

In order to provide a solid framework to answer our research question we think it is appropriate to start the following chapter with an introduction of the term's sustainability and innovation, explaining them separately. Furthermore, we combine the terms and explain the phenomena sustainable innovation. Then we will give an overview of the different perspectives of sustainable innovation, focusing specifically on the external-relationship perspective. Thereafter, we will examine the triple bottom line outcome in the context of sustainable innovation. Furthermore, we will also discuss sustainable innovation in industrial businesses. Finally, we will conclude by providing a comprehensive discussion of the conceptual framework.

2.1 Sustainability and sustainable development

The notion of sustainability is by no means a new concept. The Brundtland report "Our Common Future," which itself was published in 1987, became the first to adopt the term "sustainable development". The goal was to put sustainable development on the "international agenda". According to this report, sustainable development is defined as "the development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (World Commission on Environment and Development, 1987). For the past few decades, this definition has continued to be used as a benchmark for sustainability.

The term sustainable development is frequently linked with sustainability, and both terms are used interchangeably, even within academic and scientific literature (Olawumi & Chan, 2018; Ruggerio, 2021). Since the Brundtland report, various definitions of sustainability and sustainable development have been proposed, but arriving at a specific and widely accepted definition has proven to be difficult (Jabareen, 2008). Scoones (2007) describes the phenomenon as "[...] building epistemic communities of shared understandings and common commitment to linking environmental and economic development concerns [...]" (Scoones, 2007, p. 598). In particular, this means working together towards a common goal.

Furthermore, Portney (2015) points out the overlapping elements of sustainability as environment, economy, and equity. Also, describes sustainability as the ability to “(...) finding some sort of steady state to the Earth or some piece of it can support the human population *and* economic growth without ultimately threatening the health of humans, animals, and plants.” (Portney, 2015, p. 4) More specifically, maintain or grow process with the conscious on the environment, over time. All these definitions of sustainability and sustainable development emphasize the interdependence and inclusivity of the environmental, social, and economic dimensions.

While there are various definitions of sustainable development, the Brundtland definition has been widely accepted and established the standard for subsequent definitions (Imran et al., 2014). The Brundtland report emphasized global environmental issues and provided potential solutions. Although the report's recommendations were not legally binding, they had a significant impact. However, sustainability is a broader concept which not only focus on environment. Sustainability now encompasses three aspects: the environment, the economy and social conditions (World Commission on Environment and Development, 1987). There must be a balance and interaction between the three dimensions of sustainable development for anything to be considered sustainable and for sustainability development to occur (Dyllick & Hockerts, 2002).

In this thesis our focus is on both sustainability and innovation, combining them and explaining the phenomenon of sustainable innovation. Sustainable innovation has generated significant interest (Cillo et al., 2019; Boons et al., 2013). However, sustainable innovation is a relatively large topic, so we have chosen to limit it into three areas: 1) the relationship between companies' sustainable innovation practices from an external-relationship perspective, 2) the implementation of process and policies to achieve sustainable innovation, and 3) its triple bottom line outcome.

2.1.1 The triple bottom line (TBL)

An important approach when we talk about sustainability and sustainable development is the triple bottom line (TBL). In the last decades, the triple bottom line approach to sustainability has attracted much attention. The triple bottom line is a concept in sustainable business that refers to the three elements that make up a company's performance: economic, social, and environmental. The three elements are often referred to as the three Ps: profit, people, and

planet (Elkington, 1994; Slaper & Hall, 2011). The idea is that a company's success should not only be measured by financial performance, but also by its impact on society and the environment. The triple bottom line framework is used by companies to evaluate the sustainability of their operations and to determine the long-term viability of their business (Elkington, 1997).

The triple bottom line was first introduced in the 1990s by John Elkington and has since gained widespread recognition as a framework for evaluating the sustainability of a business (Elkington, 1994; Slaper & Hall, 2011). The economic element refers to the financial performance of a company, including profits, revenue, and growth. The social element refers to the impact of a company on people, including employees, customers, communities, and the environment. The environmental element refers to the impact of a company on the environment, including resource use, waste management, and greenhouse gas emissions (Elkington, 1997; Hubbard, 2009).

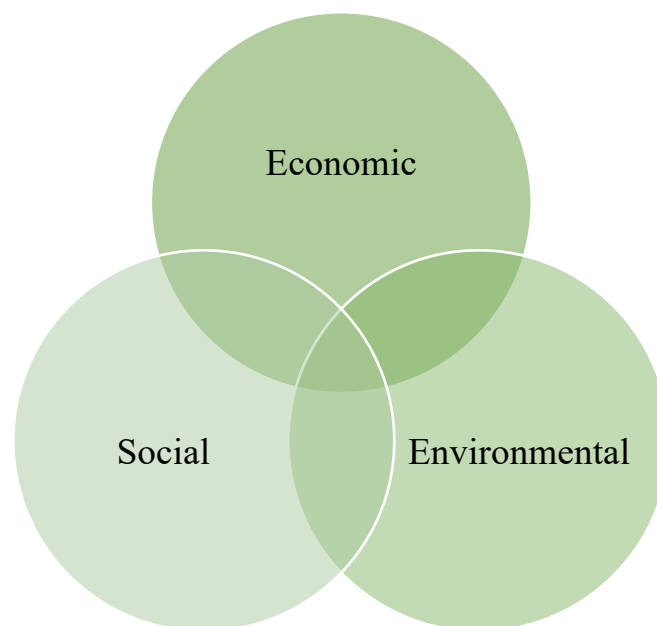


Figure 2: A presentation of the triple bottom line (TBL)

The idea behind the triple bottom line is that companies must strive for a balance between the financial performance, as well as the sustainability performance. This requires companies to take into account the long-term impacts of their operations on both people and the environment, in addition to the immediate financial returns. Companies that adopt the triple bottom line approach are more likely to be successful in the long run, as they are better

equipped to address challenges and capitalize on opportunities associated with sustainability (Elkington, 1997).

2.1.2 Drivers of sustainability

In relation to the term sustainability, Schrettle et al., (2014) divided the sustainable drivers into two groups: exogenous (external) and endogenous (internal) drivers. In the context of the external drivers (or exogenous), which are also related to the direction this thesis takes, Schrettle et al (2014) present the following three drivers that dominate: (1) environmental regulation, (2) societal values and norms, and (3) market drivers.

Environmental policies and regulations from government and other national organization's requirements, such as the UN's 17 Sustainable Development Goals (SDGs) or the Paris Agreement, are critical drivers of sustainability. Companies must comply with laws, regulations, and agreements, both to avoid legal consequences, such as fines or other costs, and to avoid negative effects on the company's reputation and/or image. (Porter and van der Linde, 1995; Carroll, 1999; Banerjee, 2001; Delmas and Toffel, 2004; Etzion, 2007; Schrettle et al., 2014).

Furthermore, there is values and norms from external stakeholders, which have a crucial influence on a company. It is essential to be aware of these values and norms, and the influence and pressure they can pose. Also, the authorities and the media are highly relevant here.

Lastly there is market drivers, which shape the market context. In terms of values and norms, Schrettle et al., (2014) stated that "[...] consumers can respond favourably to a firm's sustainability initiatives and innovation which creates demand and therefore is of highest importance." (Delmas and Toffel, 2004; Rivera-Camino, 2007; Schrettle et al., 2014, p. 76) In addition to consumers; suppliers, competitors and shareholders are also an extension to the market drives and the pressure around reputation, results, sustainability etc.

Although this thesis mainly focuses on the external perspective in businesses, it may also be relevant to mention the internal drivers (or endogenous) of sustainability. Schrettle et al (2014) presents the internal drivers as follows: "[...] represent internal forces and include

three groups: the manufacturing firm's (1) strategy, (2) culture and (3) resource base.” (Schrettle et al, 2014, p. 77)

In relation, Giunipero et al., (2012) also presented some external drivers towards sustainability. Some of the most commonly drivers that was identified where: involvement of top management, government regulation, financial benefits, competitive advantages, ISO certification, and consumer demands. Despite the different presentation, we see similarities across these previous researchers.

2.2 Innovation

Innovation is not a recent phenomenon. The Latin root of the word "innovation" is "innovare," which means to introduce something new (Aronson, 2008). There are many ways to define innovation, and there are countless definitions available. OECD (2015, p. 16) provides the following definition: “Innovation is the implementation of a new or significantly improved product (good or service) or process, a new marketing method, or a new organizational method in business practices, workplace organization or external relations”.

The term innovation has recently received a lot of attention and started to appear in most people's regular language. However, the idea of innovation is not new. It is debated that Joseph Schumpeter originated the term “innovation” in 1911 (Callegari & Nybakk, 2022; Martin, 2012). Schumpeter described innovation as the process of introducing new products, production methods or organizational structures into a new or old the markets, and saw entrepreneurs as the agents of innovation who bring about this change (Ziemnowicz, 2013).

Dodgson et. al. (2013) describe innovation as highly important for businesses to both survive and thrive. The importance of understanding how innovation can be managed is also highlighted. In order to manage such processes, they point out some essential factors that can influence the choice of innovation, for instance: “[...] historical, social, economic, cultural, legal, and technological” (Dodgson et al., 2013, p. 3). Regardless of the economic benefits and the social well-being that result from innovation, Dodgson et. al. (2013) also points out the bigger challenges around innovation, such as risks, costs, and timescales. Consequently, several companies hold back in connection with innovation due to these challenges.

Although innovation is as old as humanity itself, we like to perceive it as something new. This is mostly a result of the changes we observe in the world around us, where there is an increase in the need for restructuring and transformation. In response to the fast shifting pressure, such as globalization, digitalization, changing demographics, and especially the pressure of social and environmental challenges, the strategic focus of innovation has altered (Lee & Trimi, 2018; Lee et al., 2012). As a result, various sectors of society are emphasizing the growing significance of sustainable innovation.

2.3 Sustainable innovation

Sustainability and innovation are two terms that are often mentioned in literature, but it is difficult to find a concrete definition of sustainable innovation. It was especially after the release of the Brundtland Report, that a constructive discussion on the relationship between sustainability, transformation and innovation started (Iñigo & Albareda, 2016). Now the interest in sustainable innovation has significantly increased (Cillo et al., 2019; Boons et al., 2013). Even though recent trends demonstrate that there is a developing interest in sustainable innovation, there is still much confusion on what constitutes a sustainable innovation.

There are a number of terms which is frequently used to describe sustainable innovation, such as “eco-innovation”, “environmental innovation”, “sustainability-oriented innovation”, and “green innovation”. Usually, these terms are used interchangeably (Afeltra et al., 2021; Ben Arfi et al., 2018; Forsman, 2013; Iñigo & Albareda, 2016). The terms "green innovation," "eco-innovation," and "environmental innovation" all refer only to activities that lessen the impact on the environment. Sustainable innovation, however, extends beyond this to take into account the social dimension (Afeltra et al., 2021).

Even though the term "sustainable innovation" has been used frequently over the past years, there aren't many definitions available in the academic literature (Boons et al., 2013). Nevertheless, there are some widely cited and accepted definitions of the term sustainable innovation. Sustainable innovation is defined as “the development of new products, processes, services and technologies that contribute to the development and well-being of human needs and institutions while respecting natural resources and regeneration capacities” (Tello & Yoon, 2008, p. 165). Another definition of sustainable innovation is “innovations in which the renewal or improvement of products, services, technological or organizational

processes not only delivers an improved economical performance, but also an enhanced environmental and social performance, both in the short and long term” (Bos-Brouwers, 2010, p. 422). Furthermore, in a review by Carrillo Herмосilla et. al (2010), it was listed definitions of innovation that focused on ecological sustainability, such as eco-innovation and environmental innovation. For instance, Carrillo Herмосilla et. al (2010, p. 1075), defined eco-innovation as: “... innovation that improves environmental performance”. However, Boons et. al (2013, p. 2) built on this definition of eco-innovation and defined sustainable innovation as "innovation that increases sustainability performance," where "performance" comprises environmental, economic, and social factors.

These definitions all share similarities, which are the sustainability dimensions of innovative activities. Hence, sustainable innovation are innovations that consider all sustainability dimensions, including environmental, social, and economic throughout the entire innovation process. The objective is to minimize or prevent negative effects on the environment while also taking into account the social aspects at all levels of the innovation process, all while maintaining profitability to ensure business`s sustain (Hermundsdottir & Aspelund, 2021).

Moreover, Boons et al., (2013) present some essential points in the business model concept that can be decisive for sustainable innovation. First, we have the value proposition, which is essentially about the exchange of value between a business and its customers. It's not about building a relationship with customers just based on one service or one product. In the view of sustainability, Boons et al (2013) add that the advantage here is to be able to develop a balance between economic, social, and ecological value that is in focus. Furthermore, we have configuration of value creation, which concerns the larger system in a company. Boons et al (2013) explain that "Essential parts of this larger system are the customer interface and the supply chain." (Boons et al., 2013, p. 4) Finally, they point to social responsibility, or the distribution of costs and benefits. This is to have a good balance between other stakeholders involved and the local community in general.

The importance of sustainable innovation is increasing, and consequently, extensive research has been conducted in this area. Eccles et al. (2014) revealed that companies that incorporate sustainability into their strategies and core business processes achieve better financial performance and have a higher likelihood of long-term survival. Additionally, the study found that sustainability is positively associated with operational efficiency and innovation, suggesting that it can enhance core business processes. Furthermore, recent research suggest

that sustainable innovation and a business's competitiveness have a significant and positive relationship (Bacinello et al., 2019; Hermundsdottir & Aspelund, 2021; Qiu et al., 2020). There are several reasons as to why sustainable innovation can increase a business competitive advantage. According to Hermundsdottir & Aspelund (2021), sustainable innovation can increase a business's value creation, reduce costs, and non-financial assets, as well as increase profits, income, or revenues and improve productivity, efficiency, and quality.

2.4 Perspectives on sustainable innovation

To understand the complex nature of sustainable innovation, scholars have proposed theoretical framework that approach the topic from different perspectives. Recent literature suggest that sustainable innovation can be studied from three main perspectives: the internal-managerial perspective, the external-relational perspective, and the performance evaluation perspective (Cillo et al., 2019). The different perspectives will further be explained below.

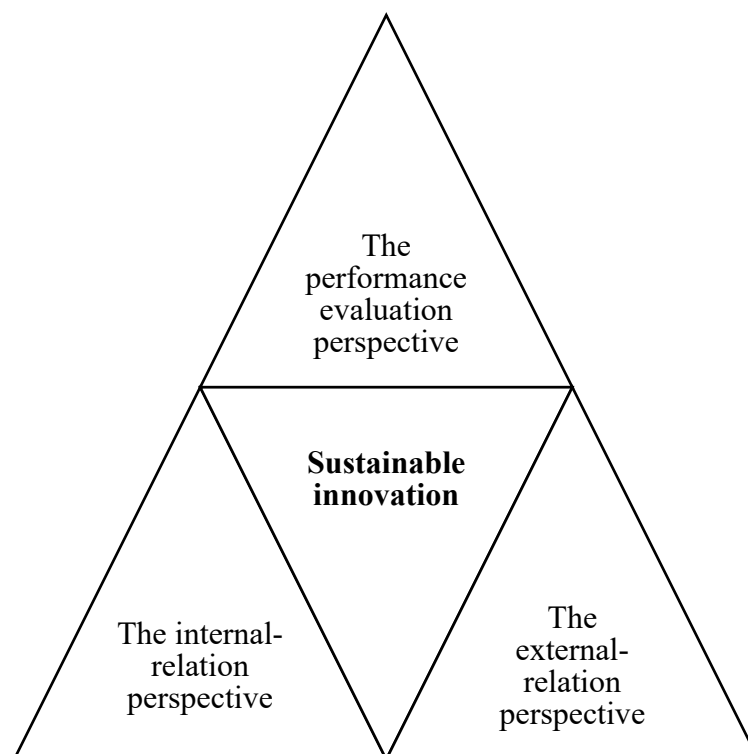


Figure 3: The perspectives of sustainable innovation

The internal-relation perspective of sustainable innovation involves increased attention to the social and environmental impacts of a company's activities, as well as to the managerial

challenges of sustainable innovation (Geels et al., 2008; Unruh et al., 2016; Cillo et. al., 2019). This perspective focuses on the ways in which a company's internal management practices and processes can be aligned to drive sustainable innovation. It considers factors such as the company's planning horizon, tolerance of uncertainty, ability to learn, and management systems in order to better understand how a company can manage the trade-off between economic, environmental, social, and other dimensions in order to drive sustainable innovation (Longoni & Cagliano, 2018; Cillo et. al., 2019). Moreover, the internal-managerial perspective can provide insights into how companies can develop strategies, practices, and processes to support sustainable innovation (Branco & Rodrigues, 2006; Chen et al., 2014; Du et al., 2013; Farla et. al., 2012; Wernerfelt, 1995), as well as help companies identify areas for improvement in their internal management practices (Cillo et. al., 2019).

The external-relation perspective, on the other hand, concerns a company's management of its external relationships. These relationships include regulatory and social governance, value chains, and sociotechnical regimes. This perspective views sustainable innovation as a coevolutionary process that involves not only the company but also the broader context of institutions, infrastructures, and consumer practices (Dodgson et al., 2013). Furthermore, this perspective highlights the importance of companies to take expectations of external stakeholders into account (Alkemade & Suurs, 2012; Seuring & Gold, 2013). This is essential in order to comprehend social and environmental actions for innovation (Rocha et al., 2011). The external-relational perspective also emphasizes the need for companies to collaborate and engage with stakeholders in innovation management and to seek to influence the context for innovation (discourses, policies, and behaviors) (Cillo et. al., 2019).

Ultimately, the performance evaluation perspective has been developed in relation to the two perspectives above. This perspective, however, focuses on the relationship between sustainability and the economic performance of a business. The performance evaluation perspective recognizes that sustainability and economic performance represent separate dimensions of a company's activities and seeks to explore the relationship between these two aspects (Cillo et. al., 2019). The aim is to determine the impact of sustainable innovations on a company's overall performance and competitiveness (Cohen et al., 2008). There is, however, few studies on the relationship between sustainability and the performance perspective (Cillo et. al., 2019).

2.4.1 External-relation perspective

Sustainable innovation consists of different perspectives. Given the complexity of sustainable innovation, we will focus solely on the external-relation perspective, which was initially introduced by Cillo et al. (2019) and has received limited attention in previous studies. We will draw on recent literature to provide insights into the external-relation perspective and its role in achieving sustainable innovation.

Although there is a growing interest in sustainable innovation, empirical evidence regarding the significance of the external-relation perspective for achieving sustainable innovation is still limited. However, there is empirical evidence that indicates the importance of external relations in the implementation of sustainability in business practices. Bansal and Song (2017) provided a study in which the role of external relations in achieving sustainable business practices is explored. Their research offered empirical evidence that emphasized the crucial role of external stakeholders in implementing sustainable business practices. The study revealed that companies that incorporate the expectations of external stakeholders into their sustainability initiatives are more likely to attain financial and environmental benefits.

Despite this, the external-relation perspective in sustainable innovation remains a concept that may require further clarification. Nevertheless, this is a relatively new perspective that will receive increasing attention in the literature. As mentioned in the chapter above Cillo et al. (2019) provide a comprehensive overview of the external-relation perspective in sustainable innovation. The authors define the external-relation perspective of sustainable innovation as the management of a company's external relationships. Furthermore, they argue that this perspective is critical for developing innovative solutions that are socially, environmentally, and economically sustainable.

Sustainable innovation is embedded in a network of relationships. According to Cillo et al. (2019), the external-relation perspective of sustainable innovation overall involves two key elements: stakeholder engagement and collaboration activities. Stakeholder engagement refers to the process of identifying and communicating with external stakeholders to understand their needs, concerns, and expectations regarding sustainability. The focus should start with inclusion of stakeholders and the integration of their respective demands. (Alkemade & Suurs, 2012; Seuring & Gold, 2013). Through this approach, businesses may be better able to comprehend their environmental and social impact (Rocha et al., 2011). Ultimately, companies can use this information to improve profitability and efficiency (Cillo

et al., 2019). Collaboration activities involves working collaboratively with external stakeholders to develop innovative solutions that meet their needs and address sustainability challenges. Because sustainable innovation is challenging to achieve within a single company, collaborating with other relevant companies is necessary (Anttonen et al., 2013; Cappa et al., 2016). Therefore, sustainable innovation can be an ecosystem generated by ongoing interactions between the economy, society, and other variables (Hsieh et al., 2017; Vollenbroek, 2002).



Figure 4: A presentation of the external-relation perspective

As highlighted above, Cillo et al. (2019) indicated that external stakeholders play a vital role in the external-relation perspective of sustainable innovation. Although this concept is relatively new and not widely used, there is considerable literature supporting Cillo's findings. Previous studies have indicated that engaging stakeholders is essential in overcoming the complexity and uncertainty of sustainable innovation since it allows companies to integrate external knowledge into their innovation processes (Ghassim & Bogers, 2019; Rodriguez et al., 2002).

2.4.2 External stakeholders

Based on the findings above, we understand that incorporating stakeholders and integrating their expectations is a crucial aspect of sustainable innovation and the external-relation perspective. Previous literature also consistently acknowledges the importance of stakeholders in sustainable innovation. While stakeholders have been discussed at length in

this section, a clear definition of the term has not yet been provided. So, who exactly are stakeholders?

Stakeholders can be defined as “any group or individual who can affect or is affected by the achievement of the firm’s objectives” (Freeman, 1984, p. 46). From this definition, stakeholders can be categorized into two: internal vs external stakeholders (Marques et al., 2019). External stakeholders are individuals or groups outside of an organization that are affected by or have an impact on the organization's activities. According to Harrison and St. John (1996) we have the following external stakeholders for a company: customers, suppliers, competitors, government agencies and administrators, local communities, activists, and unions. All these stakeholders influence a company, and it is therefore important to take them into account – especially through work with sustainable innovation. Like the explanation of sustainability, in the external perspective it is about meeting the needs and demands of these external stakeholders. Social forces, technological advances, global economic forces, and global political forces are environmental factors or uncertainty that are mentioned in accordance with the various stakeholders (Harrison & St. John, 1996, p. 50).

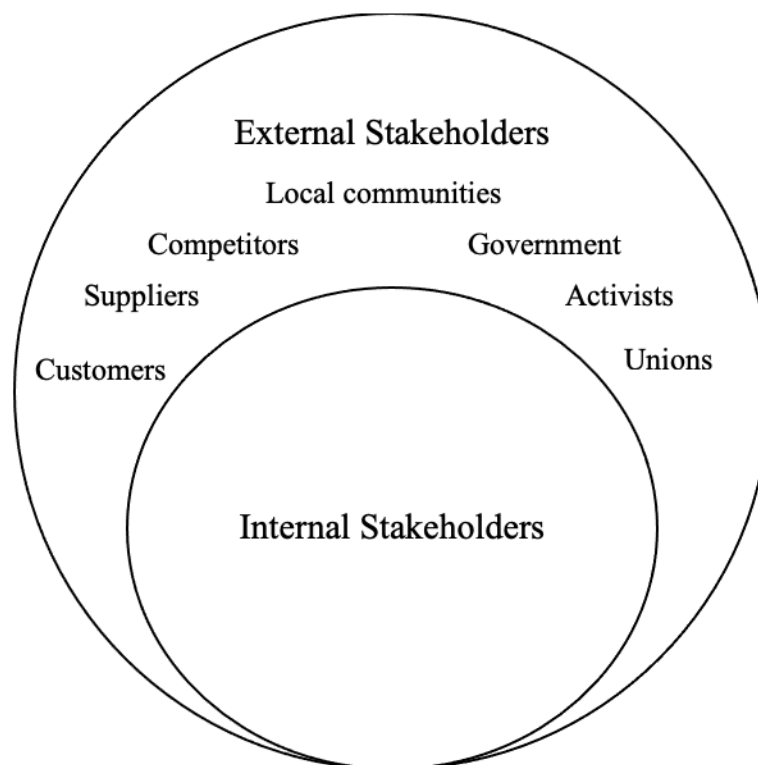


Figure 5: A model of internal and external stakeholders

There could be several reasons why businesses choose to pursue sustainable innovation. Businesses aspiration related to work with sustainable innovation can be based on acceptance, this means to meet the external pressure. They can also be the result of proactive stance, seeking to be ahead of these pressures in order to improve their competitive position (Lopes et al., 2022). Thus, it is important to know the real reason why businesses implement sustainable innovation. There is increasing pressure from both regulations and society at large for businesses to prioritize sustainable development alongside innovation in products, services, processes, and business models (Kneipp et al., 2019). Various studies have confirmed that regulations are a crucial external factor in promoting sustainable innovation. Businesses that are subject to regulations are more likely to innovate for sustainability compared to those that are not (Doran & Ryan, 2012; Hermundsdottir & Aspelund, 2021; Horbach et al., 2012).

Not only does businesses experience increased penalties from regulators or society, but they also see reduced customer demands for their products if their sustainable practices are questionable (Kassinis & Soteriou, 2003; Klassen & McLaughlin, 1996; Yalabik & Fairchild, 2011). There is a growing stream of research that identify customer demands as one of the main drivers of sustainable innovation (Horbach et al., 2012; Qiu et al., 2020; Yalabik & Fairchild, 2011). There is no doubt that consumers exert continuous pressure on firms to innovate sustainably. The level of conciseness among customers, forces businesses to provide sustainable products and services. If businesses, fail to do so they risk losing market shares (Ebrahimi & Mirbargkar, 2017; Qiu et al., 2020)

Processes

In terms of the external perspective, Albino et al., (2009) mentioned that a green supply chain is one of the key approaches to achieve in a process-oriented way. Some of the ways to go is, “(...) to close the loop along the supply chain, such as the operations designed for end-of-life products and packaging recovery, collection and reuse, the assessment of suppliers’ environmental impacts and the sharing of information about environmental issues with suppliers.” (Albino et al., 2009, p. 88). Although, there are various companies with different products, processes, and policies, and how they fancy to implement a green supply chain may vary among them.

Moreover, Dalal-Clayton and Bass (2002) understand the strategic planning of processes as:

In designing the processes and coordination system(s) that will be required to develop a strategy for sustainable development, a key task will be to map out existing strategic planning processes, as well as any past ones which can provide important lessons – identifying the key features of the processes followed, the mechanisms used, and analysing what has worked well or less well. This will help to suggest which processes and mechanisms can be built upon, which approaches might best be avoided, where there are synergies to be forged and where there are gaps that need filling (Dalal-Clayton & Bass, 2002, p. 102).

In order to make the strategy and process to work you need to, according to Dalal-Clayton and Bass (2002), find out “what works” by improving synergies, remove inconsistencies, avoiding conflicts, and fill the gaps. Similarly, the Institute for Sustainable Process Technology describes that, “Through process technology, we can improve the quality of products, optimize waste processing or make processes more sustainable.” (ISPT, n.d)

In relation, Dalal-Clayton and Bass (2002) also emphasize the importance of including and analyze the external stakeholders when planning and developing sustainable processes. By including and analyzing the stakeholders, it can provide extended growth and market benefits. Subsequently, there is a need for willingness in terms of implementation of sustainable innovation and new technological solutions, and Ahmad & Schoreder (2002) emphasis that: “Due to increased competitive pressure, today's managers are continually looking for ways to improve and sustain organizational performance” (Petts, 1997; Ahmad & Schroeder, 2002, p. 540) Furthermore, Maltais & Nykvist (2020) findings points out that “(...) benefits such as attracting not only customers but also staff and skilled competence” (Sen et al., 2006: Maltais & Nykvist, 2020, p. 9). They also stated that the stronger customers’ demands, in terms of implementing sustainable processes, indicates that the businesses’ are moving extendedly in the work with sustainable technology.

Policies

In order to promote sustainable innovation, businesses must implement policies that promote sustainable innovation. Therefore, policies related to sustainability are a core part for

companies toward sustainable innovation (Wu et al., 2022). Policies can enable sustainable innovation, which can result in the creation of novel products, services, and technologies capable of substantially diminishing social and environmental damage while offering economic benefits to the focal company (Dalal-Clayton & Bass, 2002; Wu et al., 2022).

There is much research done on the relationship between environmental regulations and industrial innovations (You et al., 2019; Afeltra et al., 2021). This research indicates that maintaining pressure on companies through the development of environmental regulations can serve as a motivation for them to innovate towards sustainability. The resulting returns from these innovations can outweigh the costs incurred by companies when complying with environmental regulations (Wu et al., 2022). Other research suggests that such regulations can have a positive impact on a business's competitiveness and performance by promoting sustainable innovation within organization (Zefeng et al., 2018).

It is developed numerous regulations which businesses must comply with. A significant number of these polices and regulations relating to sustainability have already been implemented and are progressively becoming more rigorous. The most important are, among others, the UN's sustainability goals, the Paris Agreement and The EU Emissions Trading System (EU ETS). These will be shortly explained below.

The UN's sustainability goals

The Brundtland report served as a foundation for the UN's 17 sustainability goals, among other things. In 2015, as a crucial component of the 2030 Agenda for Sustainable Development, the United Nations (UN) General Assembly established 17 Sustainable Development Goals (SDGs). Along with the 17 sustainable development goals (SDGs), 169 specific goals were also developed and thousands of indicators were created (United Nation, 2015).

Paris Agreement

Another important milestone in sustainability occurred on 12 April 2015. When an international agreement on climate policy was adopted, the agreement was named the Paris Agreement. The Paris Agreement is the first international climate accord that all nations must abide by in terms of both law and practical application. This agreement obliges member

states to set targets for reducing greenhouse gas emissions every five years. (European Council, 2023).

As one of the member states, Norway has committed to the Paris Agreement. By 2030, Norway wants to cut its greenhouse gas emissions from 1990 levels by at least 50%. In addition, Norway is trying to achieve climate neutrality by 2030 and a low-emission society by 2050 (Klima og miljødepartementet, 2021).

The EU Emissions Trading System (EU ETS)

The European Union implemented The EU Emissions Trading System (EU ETS) in 2005 as the cornerstone of its strategy to reduce emissions of carbon dioxide (CO₂) and other greenhouse gases. This is primarily designed for industry and functions by establishing a cap on the total amount of CO₂ equivalents that may be released annually. Over time, this is diminished to the point where emissions are similarly reduced. For the EU to meet its duties under the Paris Agreement, this is its most crucial tool (European Commission, 2021).

The EU ETS has demonstrated to be a successful mechanism for achieving emission reductions in the sectors it regulates at an affordable cost, and it has been credited with contributing to decarbonize the European power sector. Between 2005 and 2019, installations subject to the ETS lowered emissions by about 35% (European Commission, 2021).

2.5 Sustainable innovation and the triple bottom line (TBL)

The triple bottom line of sustainability is acknowledged in recent scholarly discussions as a desired ideal but an unproven reality (Weidner et al., 2021). The triple bottom line approach evaluates the success of sustainable development in businesses by considering environmental, social, and economic performance (Elkington, 1994). Sustainable innovation can be a crucial element of the triple bottom line framework, as it encourages businesses to create novel products, services, and processes that prioritize environmental and social responsibility, while remaining economically profitable.

The main question is whether innovative sustainability can help businesses attain the triple bottom line outcome. There is still limited research on the triple bottom line and sustainable innovation. Nonetheless, in recent years, this subject has gained greater attention. Weidner et al. (2021) delved into this topic and discovered that the relationship between the three aspects of the triple bottom line is not simple, with each one being a direct result of sustainable

innovation. This study found that sustainable innovation plays a crucial role in contributing to the triple bottom line. However, the contribution is not a linear one, as sustainable innovation strengthens a firm's environmental and social performances ultimately leading to an increase in financial performance.

The pursuit of sustainable innovation is grounded in prioritize both the environment and social performance. Over time the significance of both environmental and social performance has increased. The social aspect of a company's impact relates to its effect on people, such as employees, customers, communities, and the environment. The environmental element, on the other hand, focuses on how a business affect the environment, including resource use, waste management, and greenhouse gas emissions (Elkington, 1997; Hubbard, 2009). We anticipated that sustainable innovation has a direct correlation with a company's social and environmental performance.

However, the economic performance could be a separate issue. The economic element in the triple bottom line refers to a business's overall financial performance, including profits, revenue, and growth (Elkington, 1997; Hubbard, 2009). Economic performance is a crucial aspect, as businesses must remain profitable to survive and provide growth. Nonetheless, more research is demonstrating the economic advantages of implementing sustainability into businesses (Eccles et al., 2014; Maletic et al., 2015; Wagner, 2010). Furthermore, sustainable innovation can provide a competitive advantage in the market (Bacinello et al., 2019; Hermundsdottir & Aspelund, 2021; Qiu et al., 2020). This will again generate economic advantages.

2.6 Sustainable innovation in industrial businesses (manufacturing)

To promote sustainability and tackle challenges such as climate change, resource depletion, and social inequality, businesses play a crucial role. Unfortunately, they are often perceived as the primary contributors to these issues, leading to a severe lack of sustainability in society (Lozano, 2012, Schaltegger & Wagner, 2011, Thakur & Gupta, 2012). The industrial sector is one such industry facing significant environmental challenges. According to figures, oil, and gas production, along with industry, are the main causes of climate emissions in Norway (Miljødirektoratet, 2022). In 2021, oil and gas extraction accounted about 12.1 million tonnes of CO₂ equivalents of greenhouse gas emission, while industry and mining accounted for approximately 11.7 million tonnes (Statistisk sentralbyrå, 2022).

Nevertheless, the primary responsibility of our generation is leaving the planet in better condition than when we inherited it. This entails the expectation that industrial businesses must generate resources as efficiently as possible, with minimal greenhouse gas emissions, and with ethical and environmental considerations (Prosess21 Ekspertgrupperapport, 2020). In recent decades, however, there have been significant changes in the pattern of production and consumption, resulting in transformations in society and the environment (Kneipp et al., 2019). Industrial businesses recognize the significant prospects for sustainable innovation within the industry, including the development of new business models, products, and technologies that it can address the challenges that the market faces (Prosess21 Ekspertgrupperapport, 2020).

2.6.1 Sustainable manufacturing

The EU business standard (NACE Rev. 2), defines industry or manufacturing as

"(...) the physical or chemical transformation of materials, substances, or components into new products, even if the products are sold from the place where they are produced. The term industry also includes the assembly of parts into finished products, recycling of waste, specialized maintenance and repair of industrial machinery as well as installation of industrial machinery and equipment" (Eurostat, 2008, p.112).

The significance of manufacturing in our societies is underscored by its social and environmental implications. The environmental aspect of manufacturing carries a significant influence on energy consumption, physical resource utilization, and emissions to the environment. As such, sustainable manufacturing is regarded as a critical area of focus for advancing the broader objective of sustainable development. Therefore, sustainable manufacturing may/or should be considered as one of the most important issues related to sustainable development, or sustainable innovation (Garetti and Taisch, 2012). More specifically, Garetti and Taisch (2012) defined sustainable manufacturing as:

[...] the ability to smartly use natural resources for manufacturing, by creating products and solutions that, thanks to new technology, regulatory measures and coherent social behaviours, are able to satisfy economical, environmental and social

objectives, thus preserving the environment, while continuing to improve the quality of human life (Garetti & Taisch, 2012, p. 85).

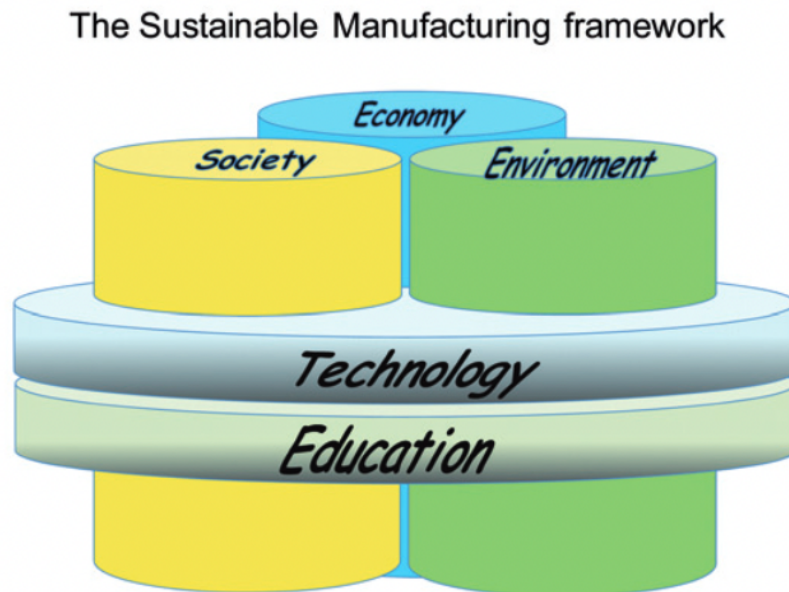


Figure 6: Technology and education as sustainability enablers for sustainable manufacturing

(Garetti & Taisch, 2012, p. 85)

Garetti and Taisch also present the following framework around the literature, where figure 6 shows that technology influence, implement, and increase the possibility of developing new or better processes/products. As we see in the figure, technology affects both the society, economy, and environment. Also, education is a part of the framework, and tends to increase knowledge about the appropriate use. Lastly, it is an extension of *figure 2*, the presentation of the triple bottom line (TBL).

2.6 Conceptual framework

The conceptual framework helps us describe the main variables that should be studied in this research. Our research focuses on sustainable innovation and aims to develop a framework for data collection and analysis using theories that connect different aspects of this topic. By conceptualizing these theories, we will identify measurable variables and define key points. A graphical representation of our conceptual framework is produced in figure 7.

In Figure 7, the primary theme is illustrated as the result of our three research questions, ultimately leading to the triple bottom line.

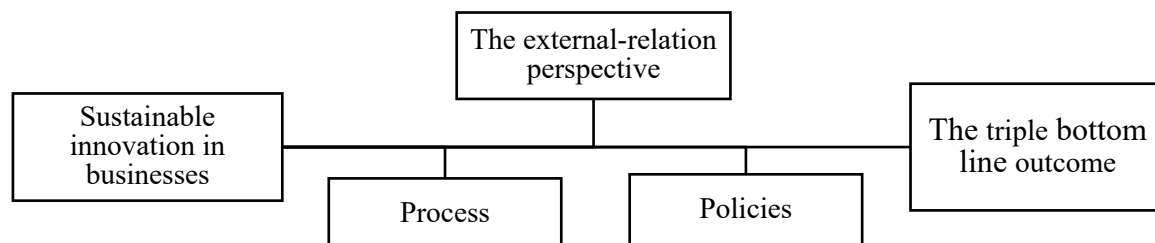


Figure 7: Conceptual framework for the study

Based on the conceptual framework we are trying to illustrate a pathway from sustainable innovation which leads to sustainable innovation in businesses. The course of this path is affected by the external-relation perspective, with a particular emphasis on processes and policies. Moreover, the relationship between businesses' sustainable innovation practices from an external-relations perspective can lead to the triple bottom line outcome.

The conceptual framework shows the information gathered from earlier literature on sustainable innovation in the literature review. Research question one concerns sustainable innovation within businesses, and emphasizes the importance of the external-relation perspective. Research question two concerns the implementation of process and policies. This is two variables affects businesses in achieving sustainable innovation, together with the external-relation perspective. These areas will eventually lead to the final research question which involves the impact of sustainable innovation on companies' triple bottom line outcome.

Table 1: Presentation of the variables in the conceptual framework

Purpose	Research objectives (RO)	Theoretical affiliation	Questions
<i>Mapping the businesses' relation towards sustainable innovation.</i>	RO1	<p>The definition of sustainable innovation is "innovations that improve sustainability performance." (Boons et al., 2013, p. 2).</p> <p>In the past decade, sustainable innovation has experienced a significant rise in interest (Cillo et al., 2019; Boons et al., 2013).</p> <p>Sustainable innovation provides a potential path forward as businesses faces increased worries regarding resource depletion, environmental degradation, and social inequalities (Weidner et al., 2021).</p>	<p>Are you familiar with the term "sustainable innovation"?</p> <p>What do you associate with sustainable innovation?</p> <p>What relation does the company have to sustainable innovation?</p> <p>Why do you think it is important for your company to focus on sustainable innovation?</p>
<i>What kind of processes and policies are taken into action to achieve sustainable innovation?</i>	RO2	<p>Companies must comply with laws, regulations, and agreements, both to avoid legal consequences, such as fines or other costs, and to avoid negative effects on the company's reputation and/or image. (Porter and van der Linde, 1995; Carroll, 1999; Banerjee, 2001; Delmas and Toffel, 2004; Etzion, 2007; Schrettle et al., 2014).</p> <p>In order to achieve sustainable development in business(es), it is necessary to reduce environmental pollution, as well as managing one's own value chain and getting rid of unethical and illegal conditions (Saunila et al., 2018).</p>	<p>How does the company work with sustainable innovation?</p> <ul style="list-style-type: none"> - How does the company implement processes in order to achieve sustainable innovation? - How does the company implement policies in order to achieve sustainable innovation?
<i>Broadened understanding of the external relations perspective, regarding sustainable innovation in businesses'</i>	RO1 RO3	<p>Cillo et al. (2019) define the external-relation perspective of sustainable innovation as the management of a company's external relationships.</p> <p>The external perspective highlights the importance of companies to take expectations of external stakeholders into account (Alkemade & Suurs, 2012; Seuring & Gold, 2013).</p> <p>The external-relational perspective also emphasizes the need for companies to collaborate and engage with stakeholders in innovation management and to seek to influence the context for innovation (discourses, policies, and behaviors; Cillo et al., 2019).</p>	<p>What influences the company to work with sustainable innovation?</p> <ul style="list-style-type: none"> - Do external stakeholders influence the company to work with sustainable innovation? If so, which one and why (authorities, customers, suppliers, local communities, etc.)? - How does the company relate to these different stakeholders? Is there someone who has a greater power of influence than others? If so, elaborate on this.
<i>Mapping the respondents' experiences in engaging in sustainable innovation activities</i>	RO1	<p>Environmental policies and regulations from government and other national organization's requirements, such as the UN's 17 Sustainable Development Goals (SDGs) or the Paris Agreement, are critical drivers of sustainability. Companies must comply with laws, regulations, and agreements, both to avoid legal consequences, such as fines or other costs, and to avoid negative effects on the company's reputation and/or image. (Porter and van der Linde, 1995; Carroll, 1999; Banerjee, 2001; Delmas and Toffel, 2004; Etzion, 2007; Schrettle et al., 2014).</p> <p>Recent research suggest that sustainable innovation and a business's competitiveness have a significant and positive relationship (Bacinello et al., 2019; Hermundsdottir & Aspelund, 2021; Qiu et al., 2020).</p>	<p>How does the company experience requirements relate to sustainable innovation from stakeholders?</p> <p>What advantages does the company gain from engaging in sustainable innovation activities?</p> <p>What makes the company decide to invest in sustainable innovation?</p>
<i>Mapping the effects that sustainable innovation has on the triple bottom line outcome (TBL), in businesses'</i>	RO3	<p>According to Weidner et al. (2020) the relationship between the three aspects of the triple bottom line is not simple, with each one being a direct result of sustainable innovation.</p> <p>Companies that adopt the triple bottom line approach are more likely to be successful in the long run, as they are better equipped to address challenges and capitalize on opportunities associated with sustainability (Elkington, 1997; Savitz, 2013).</p>	<p>How does the sustainable innovation implementation process affect the environmental, social and economic outcomes or improvements (TBL)?</p> <ul style="list-style-type: none"> - Does the company succeed in meeting all the requirements in terms of the environment, social, and economic?

3 Research Methods

The purpose of this chapter is to present the methodological framework for this thesis.

In this chapter, we will initially describe and justify the research methodology for this master's thesis. First, we will provide a description and justification for our choice of the research approach. Furthermore, we will detail the methods employed for data collection as well as sample selection. Finally, we will describe how we perform our data analysis and evaluate the thesis' credibility and ethical concerns.

3.1 Research approach

The research methodology deals with obtaining, analyzing, and interpreting data. There are essentially two methods of obtaining data: quantitative research and qualitative research. While quantitative research collects and records data in form of numbers, qualitative research gathers and records data through text, visual and sound (Christensen et al., 2015). A more detailed description of these two research methods is provided below.

Quantitative research involves collecting numerical data to answer a specific research question. This type of data is often obtained through structured questionnaires, with predetermined questions and a clear problem to be addressed. The emphasis in quantitative research is on gathering a smaller amount of data from each participant, but on a larger number of participants overall (Christensen et al., 2015).

The purpose of this study is to investigate the importance of focusing on the sustainable innovation from an external-relational perspective, as well as the process and policies to implement sustainable innovation considering the triple bottom line outcome. A quantitative approach is considered more appropriate to gain an in-depth and detailed understanding of identified research purpose. More specifically, the qualitative methods allow us to gather rich and in-depth data from participants, even though the number of participants may be smaller than in quantitative studies. The focus is on gathering as much and as detailed data as possible from each participant and analyzing the data for patterns and themes. Furthermore, qualitative research is an interpretive approach that involves collecting subjective data from individuals in natural settings. By using qualitative method, we gain a deeper insight and understanding of the importance of sustainable innovation in industrial businesses (Christensen et al., 2015).

Overall, the flexibility and adaptability of qualitative research methods make them valuable tools for exploring a wide range of research questions across various disciplines. With the ability to gather and record data through text, visual, and sound means, qualitative research methods provide a comprehensive understanding of the research question, enabling researchers to explore complex phenomena in greater depth (Christensen et al., 2015).

3.1.1 Case study

The next step in the research process is to choose a research design which will be appropriate to answer the research questions. In this thesis, we have chosen to use case study. Case study is a popular approach to qualitative research (Christensen et. al., 2015), which involves an in-depth investigation of a current phenomenon in actual settings (Crowe et al., 2011).

According to Christensen et. al. (2015, p. 377), a case study can be described as “the intensive and detailed description of one or more cases”. A case primarily relates to a “bounded system”, which may be a specific individual, an organization, an activity, a process or an event. The term “bounded system” needs clarification, further, we will therefore give a more detailed explanation of this element. First and foremost, the term “system” in this context refers to a comprehensive entity that comprises a network of interrelationships among the constituent elements of the case. When a case is described as being "bounded," it means that there is typically a boundary defining what the case is and is not. The major question in case study research, according to Christensen (2015, p. 377), is "What are the characteristics of this single case or of these comparison cases?".

There are three kinds of case studies: collective, instrumental, and intrinsic. The intrinsic case study aims to comprehensively describe a specific individual, organization, or event for purpose of gaining a deep understanding of the case itself. An instrumental case study on the other hand, is conducted to shed light on a particular issue or refine or modify an existing theoretical explanation. Lastly, the collective case study, also called a comparative case study, entails a thorough analysis of two or more individual cases (Christensen et. al., 2015).

We have chosen to use a collective case study, which entails examining several cases to gain a more comprehensive understanding of a particular problem (Christensen et. al., 2015). In our research, we wanted to go deeper into our research problem - sustainable innovation - by making use of several cases. Our focus was on investigating this problem at an organizational

level, with each individual company or organization being considered as a case. In order to gain a comprehensive dataset, we attempted interview one or more individuals within each company or organization. We emphasized that the respondents had competence in the area of sustainable innovation, as well as being in a leading position in the company or organization.

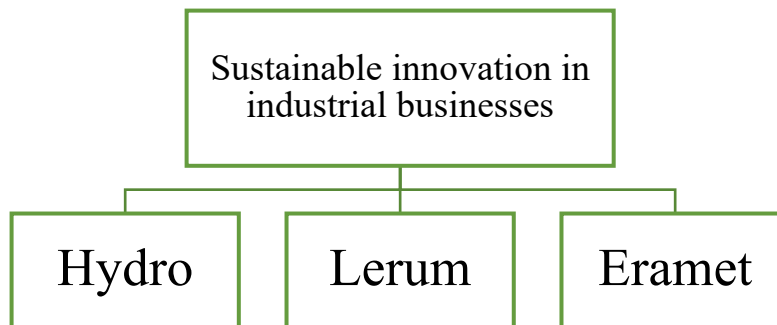


Figure 8: A presentation of our collective case study

The collective case studies allow us to examine the phenomenon in different contexts, which can lead to a more comprehensive understanding of the issue being studied. First, the collective case study research design is a valuable tool for gaining a broad and deep understanding of complex phenomena within a real-world context. Second, its ability to provide insights from multiple perspectives and the comparison across several cases makes it a useful research design (Crowe et al., 2011).

3.2 Data collection

This sub-chapter provides an overview of the data collection process for this thesis, including an explanation of the interview guide, details on the sampling and recruitment methods employed, information on the respondents, and an outline of how the data was collected.

3.2.1 Interview

The purpose of this research is to investigate the importance of the relationship between a business's sustainable innovation practices from an external-relation perspective and its triple

bottom line outcome. In order to investigate this, we limit ourselves by formulate three underlying research questions. The interview was chosen as an appropriate data collection method to answer the research questions.

An interview is a frequently used data collection method in qualitative research (Kallio et al., 2016; Holloway, 2005). Essentially, an interview serves as a conversation between the interviewer and interviewee, wherein the interviewer asks questions to collect information about a particular topic or matter (Christensen et al., 2015). Interviews can therefore help researchers gain greater knowledge and understanding in an area where they may lack prior expertise. Furthermore, it will give the researcher an understanding of participants' experience, opinions, perspectives attitudes and knowledge (Rubin H. & Rubin I., 2012). It is possible to conduct interviews both in person and over the phone. Interviews can also be conducted electronically, such as over the internet (Christensen et al., 2015).

Interviews can be conducted in various forms, such as structured, semi-structured, and unstructured. Due to the fact that structured interviews frequently result in quantitative data, we will concentrate on unstructured and semi-structured formats (DiCicco-Bloom & Crabtree, 2006). An unstructured interview involves conducting an open-ended conversation between the interviewer and interviewee, where one does not follow a specific set of questions but rather allows the conversations to flow naturally (Grønmo, 2016). However, the most frequent interview format in qualitative research is semi-structured format (DiCicco-Bloom & Crabtree, 2006; Kallio et al., 2016). We have chosen to use semi-structured interviews, where the topics are determined in advance by us as researchers. To effectively utilize semi-structured interviews, it is necessary to have a prior understanding of the research topic as the interview questions are based on pre-existing knowledge. These questions are prepared in advance and created using an interview guide. The interview guide outlines the primary topics of the study, providing a target framework for discussion during interviews. However, it is not meant to be followed rigidly. Rather, the goal is to explore the research area by eliciting comparable types of information from each participant, while also giving them direction on the topics to be discussed (Kallio et al., 2016).

When it came to the execution of the interview, we wished to be as flexible as possible, considering the busy schedules and limited availability of some of the participants. Therefore, the interviews were conducted both physically and digitally. The interviews lasted about 60

minutes, and we learned a lot from each one. All of the informants appeared to be concerned about sustainable innovation, both personally and professionally.

Initially, we decided to offer a brief overview of the research in order to repeat some of the material from the information letter. Furthermore, we explained that the informants will be kept anonymous for the assignment and won't have their name disclosed; only information about their company would be mentioned. Additionally, we inquired as to whether it would be alright with them if the interview was taped. The utilization of video and audio recording provided a significant benefit, enabling us to shift our attention towards the interviewees and fostering a more fluid conversation. Furthermore, we appointed a word manager to lead the interview, while the other interviewer ensured that all the questions were covered and took notes. Nonetheless, both interviewers had the opportunity to ask additional follow-up questions during the interview. This allowed us to concentrate our complete attention on the interviewee. In the interview, it was crucial for us to demonstrate a genuine interest in what the interviewee had to say and actively listen to their responses, as well as being respectful.

3.2.2 Development of the interview guide

Before we could conduct the interview, we had to prepare an interview guide. Designing an interview guide is a crucial component of getting prepared for data collection. The interview guide provides a general outline of how the interview should be conducted, with a focus on the subjects that should be covered with the respondent. During the interview guide development, researchers must evaluate the information requirement and consider the type of information to be acquired through the interview process. This evaluation is grounded in our research questions (Grønmo, 2016).

Based on the research questions, we created more concrete questions that we could use in the interview guide. The questions in the interview guide are developed based on the theory, literature, and information presented in the literature review (*chapter 2*). In the survey, one of our topics is "the importance sustainable innovation in businesses", and then we prepared these various interview questions within the topic:

- Are you familiar with the term “sustainable innovation”?
- What do you associate with sustainable innovation?
- What relation does the company have to sustainable innovation?

- Why do you think it is important for your company to focus on sustainable innovation?

Once the topics and questions have been prepared, consideration must be given to the structure of the interview guide. Typically, the guide starts with light, simple, and engaging topics to establish a positive tone and flow (Grønmo, 2016). In the interview guide, we intended to start by gathering demographic information, i.e., where the respondent worked, what his/her responsibilities are in the organization, etc. Furthermore, the first part of the interview guide is followed by more complex and significant topics that form the core of the interview guide (Grønmo, 2016). In the main part of the interview guide, we started with general questions about sustainable innovation, then moved on to sustainable innovation from the external-relations perspective and then on to the impact of sustainable innovation on the triple bottom line result. Finally, the interview usually concludes with easy and uncomplicated questions to leave both the researcher and respondent with a positive impression of the conversation (Grønmo, 2016). Therefore, we ended the interview guide with the questions: "Would you like to add something?" and "Do you have any advice for potential interviewees we should talk to?".

It is important to mention that in our research, we have decided to provide two interview guides: one for businesses and one for experts on the field. By providing two distinct interview guides, we can gather a comprehensive understanding of sustainable innovation from both for an industrial business perspective and an expert perspective. The insights gathered from these interviews will enable us to develop a nuanced understanding of the relationship between businesses' sustainable innovation practices from an external-relations perspective and its triple bottom line outcome.

Lastly, it should be noted that the interview guide was not strictly adhered to. Instead, we tailored the interview based on the responses we received from each individual respondent or company.

Pre-study

To ensure the clarity and avoid repetition or misinterpretation of questions during the interviews, we decided to test the interview guide on acquaintances before the actual interviews. Nevertheless, the initial interview provides us with insight into the interview guide's design. Consequently, we had to modify the guide before its finalization.

3.2.3 Sample and recruitment

The purpose of this research study is to identify and increase knowledge around the importance of sustainable innovation in industrial businesses. More specifically, it was therefore important for us to recruit respondents with knowledge around this topic, and who work precisely with these types of challenge. In order to get a broad view of the matter, we will therefore interview several businesses within industrial production, all of which have a desire and a goal to contribute to the green shift – something that can be seen as a criterion for contributing to the study.

Accordingly, to further shed light on the issue, we have also chosen to obtain experts in the field.

“Purposeful sampling is widely used in qualitative research for the identification and selection of information-rich cases related to the phenomenon of interest.” (Palinkas et al., 2015, p. 533) In particular, purposeful sampling is about obtaining information to increase knowledge around a given topic of interest, which in this assignment will be: the relationship between businesses’ sustainable innovation practices from an external-relations perspective and its triple bottom line outcome. Furthermore, Palinkas et al., (2015) explain that within qualitative research and purposeful sampling there are several different strategies and methods for obtaining data. An observation is that both the qualitative and quantitative research sampling methods aims to maximize efficiency and validity. (Morse & Niehaus, 2009; Palinkas et al., 2015) As a result, it is important to gain the right amount of information and knowledge through the recruited respondents.

Palinkas et al., (2015) presents several different strategies that show how, and the purpose of the information obtained. Among these strategies, there is *Criterion-i*. Moreover, Palinkas et al., (2015) explain the strategy as “To identify and select all cases that meet some predetermined criterion of importance”. (Palinkas et al., 2015, p. 535) Of all the strategies, this is the one that suite our thesis theme the most. Lastly, it is important to acknowledge that this purposeful sampling strategy aims to identify both similarities and differences.

In order to conduct our research, we needed respondents with the qualifications to respond to inquiries on sustainability and innovation, as well as respondents who were thought to be

relevant in relation to the task's approach. Therefore, the respondent must satisfy the following three requirements:

1. Holds a management position with the company/organization.

By holding a leadership position, preferably as sustainability and/or innovation manager, the person in question probably has knowledge of the company's or organization's work with sustainable innovation.

2. They have the power to influence how the company/organization approaches innovation and/or sustainability.

The person must have confidence of the company's or organization's management for their expertise in sustainable innovation.

3. The company/organization must operate in the industry sector.

In order to ensure an overview of sustainable innovation in Norwegian industry, it is a requirement that the company/organization is part of this sector.

Based on the two samples we have chosen, we aimed to interview four respondents from various industrial businesses and two within experts in the field. In total, we selected six respondents to contact in the first round. As we established contact with the respondents, we hoped to identify additional respondents who were relevant for the study and could be contacted.

3.3 Processing of collected data

Six interviews were conducted using audio/video recordings. Each interview lasted approximately from 30 to 60 minutes, resulting in a substantial amount of data. The recordings cannot be used directly in the data analysis. Therefore, this is where the process of transcribing the interviews starts. Transcribing is the method used to transform spoken words into written text (Halcomb & Davidson, 2006). This involves converting the recordings into textual data so that they can be analyzed.

Shortly after the interviews ended, we transcribed the recordings in their entirety. We transcribed all the interviews ourselves. The result of the transcription was almost 20 000 words. Although this proved to be a time-consuming procedure, it helped us gain a deeper understanding of the data. After the transcribing comes the data analysis and coding, which is described more in the following sub-chapters.

3.4 Data analysis

This section outlines the method used for data analysis. Typically, qualitative data is obtained in the form of text, which in our case was gathered through transcribed interviews. This approach yielded a large amount of data, necessitating a thorough analysis to uncover meaningful patterns within the material. To a large extent, data analysis is about uncovering or typical patterns in the material (Grønmo, 2016).

There are numerous of approaches to data analysis. According to Mei (2022) all qualitative data analysis requires the same four crucial steps:

1. Raw data management - 'data cleaning'
2. Data reduction, I, II – ‘chunking’, ‘coding’
3. Data interpretation – ‘coding’, ‘clustering’
4. Data representation – 'telling the story', 'making sense of the data for others'

Based on the model above, the analysis work starts with *raw data management*. The purpose of this phase is to prepare and organize raw data material into meaningful units of analysis. This means transforming audio, video or picture into transcripts. The second phase is *data reduction*, which consist of two steps. First, it is necessary to get a sense of the data holistically. This means reading several times, then read the data again. Repeat this several times, to start developing an understanding of the data as a whole. Start making annotation in the margin, as well as “chunking” the data into categories that makes sense to you. Secondly, once you have become familiar with the data you have to proceed with reducing data from chunks into clusters and codes to make meaning of the data. The third phase we had to go through was *data interpretation*. During this face, you start clustering chunks of similar data. While doing this, you are reading over the data chunks, improving your code book, and limiting the extent of each code. The last phase in the data analysis is *data representation*, which occurs concurrently with interpretation and analysis of qualitative data. As researchers read and re-read the data, they interpret and categorize it, using inductive reasoning to develop a thematic analysis. The themes that emerge from this process form the story or narrative of the data (Mei, 2022).

In our research, we chose to utilizing case study, more specific collective case study. This particular method entails conducting cross-case analysis. In cross-case analysis, the

researcher compares and contrasts multiple cases, seeking out commonalities and differences in order to identify patterns that are present across the cases (Christensen et al., 2015).

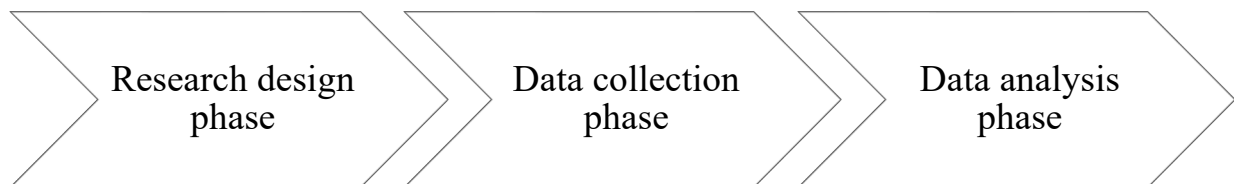


Figure 9: The qualitative research process

3.4.1 Coding

The data analysis after the interviews were mainly based on audio/video recordings. These recordings were subsequently transcribed into text, which was then subjected to coding. The purpose of the coding process was to give a comprehensive overview of the data collected during the interviews.

The analysis of qualitative data can be difficult and frequently irritating. The findings and results do not simply appear from your transcripts; rather, they involve deliberate selection of the most crucial components, which must be synthesized into a compelling "narrative". This narrative must provide answer to the research questions and offer insight that are accordance to the data (Skjott Linneberg & Korsgaard, 2019). By simplifying and summarizing the text's content, coding the material is a crucial step in producing an overview. This involves identifying a few key words or phrases that capture the essence of a longer section of the text, such as a few sentences or paragraphs. These codes serve as the essential keywords (Grønmo, 2016).

There is no "right" way of doing the coding process. There are, however, several steps involved in coding. We proceed with these three steps: open coding, category, and concept. The first step is open coding, which involves the first characterization and classification of the most essential elements in the data material. In this case, the research questions serve as a crucial criterion for determining the significance of the content of the data material (Grønmo, 2016). Furthermore, we have the next step which is category. A category is a collection or

class of phenomena with some shared traits. Which phenomena fall under the given category and which ones do not, are determined by the definition of the common characteristics (Grønmo, 2016). The final is to develop terms. When seen in the context of the categories, which is described above, a term might serve as an identifier for the phenomena that fall under that category. A term could therefore serve as a name of a category (Grønmo, 2016). In the table below an example of our coding process is presented.

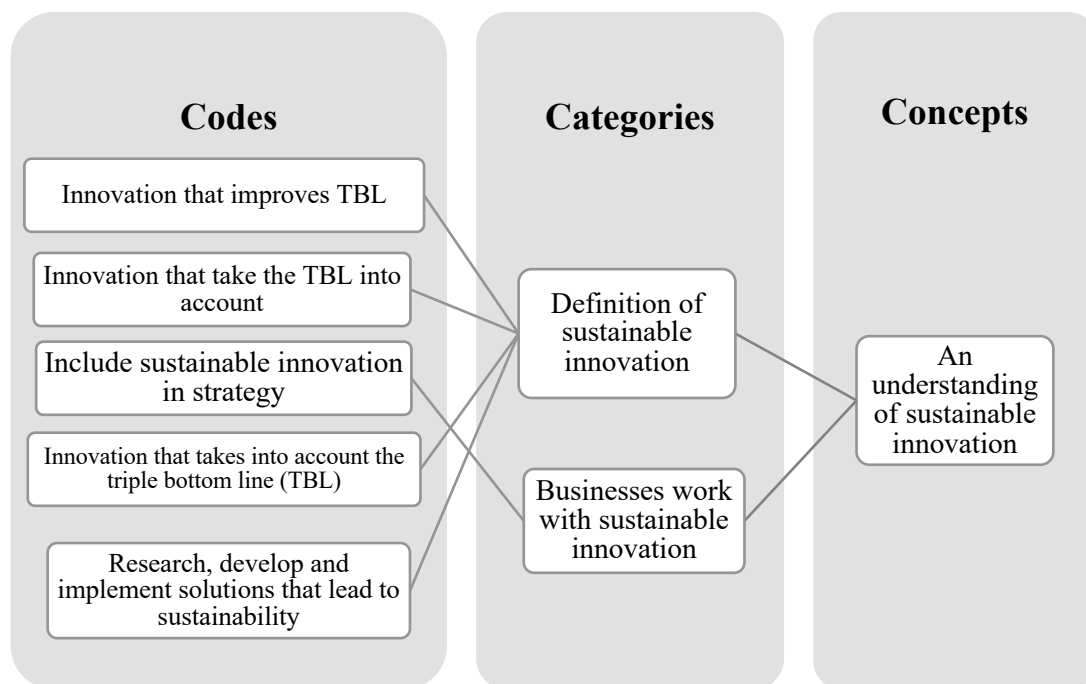


Figure 10: A presentation of our coding process

3.5 Reliability and validity

In this sub-chapter both reliability and validity will be evaluated.

3.5.1 Reliability

A research paper of high quality is characterized by a significant level of reliability. Reliability is defined as “the consistency or stability of scores” (Christensen et al., 2015, p. 155). In other words, if a measurement can be obtained repeatedly using the same method in the same conditions, it is considered reliable (Grønmo, 2016).

Moreover, Kirk et al. (1986) distinguished three types of reliability within the qualitative research: (1) when a single method gives the same result over a given repeatedly time scope, (2) when there is a stability of an observation through time, and (3) when there is a similarity of observations within the same time period (Kirk et al., 1986, p. 41-42).

First of all, in our research we developed an interview guide. The interview guide was developed based on earlier research within sustainable innovation practices. Furthermore, when it comes to the handling of data, careful thought was given to reach a sufficient number of respondents, without exceeding a limit. By exceeding a sufficient number, it can lead to many perspectives and thus unnecessary information for the study. In addition, both position and knowledge were important when we selected the respondents. Therefore, the respondents that were selected had great knowledge about sustainability, innovation, and industrial businesses. Moreover, we carried out the data collection carefully, both with video/audio recordings and written notes. There will be sufficient discussion and interpretation of the collected data against existing literature before we reach any conclusions. These precautions are taken into account on the basis that we have little practical experience with data collection. Overall, this will consequently help strengthen the reliability of our research.

Finally, it is important to mention that reliability is a prerequisite validity, but a reliability is not necessarily valid (Christensen et al., 2015). The following section will discuss validity in more detail.

3.5.2 Validity

Validity involves “the correctness or truthfulness of an inference that is made from the results of a research study” (Christensen et al., 2015, p. 179). In other words, validity aims to determine if the research and collected data truly measure what’s intended, as well as how truthful the results are. This is often more difficult in a qualitative method, as it doesn’t measure anything specific and have nothing to measure against.

There are several types of validity particularly relevant in qualitative research. In our research, we’ll discuss three different kinds of validity: descriptive, interpretive, and internal (Christensen et al., 2015). These will be explained in more detail below.

First, there is descriptive validity which is the extent that the researcher’s account is accurate and factual (Christensen et al., 2015). Having multiple researchers can improve this validity.

In our research, there are two researchers that collect and interpret the data, reducing the impact of individual bias. When multiple researchers agree on the descriptive details, reader can have more confidence in the validity of the account in a qualitative research report, thus enhancing the descriptive validity. Furthermore, the second type of validity in this research, is interpretive validity. This measures how accurately the researcher conveys the meanings that the participants assigned to the subject matter under study (Christensen et al., 2015). Obtaining feedback from participants is a means of enhancing this validity. This involves discussing the research findings with the participants to determine whether they agree with the interpretations of their perspectives. Based on their feedback, changes can be made to better represent their opinions and ways of thinking. In our research, we shared our interpretations with participants via email to ensure accurate understanding of their viewpoints. The last type of validity in this research is internal validity. To strengthen this type of validity, it is important to interview a diverse range of individuals. In our research, we interviewed both field experts and representatives from various industrial companies. When attempting to come to accurate conclusions regarding the cause or causes of a particular outcome, it is important to avoid limiting oneself to a single data source (Christensen et al., 2015).

By taking the terms above under consideration, both reliability and validity are tools that could provide a bigger value to the data collection and the research itself.

3.6 Ethical concerns

As part of our in-depth interview, the intentions is to uncover the respondents experience, thoughts and meanings, to gain further knowledge around the topic. Since we are doing an in-depth interview there are some ethical concerns to consider. Allmark et al., (2009) proposes that, among other things, privacy and confidentiality, as well as informed consent can cause harm to the respondents. It will therefore be important to build a safe framework around these concerns. If we do not create trust with a respondent, it may affect the answers we receive.

Compare to, Bell and Bryman (2007) also presented some ethical principals in their research. These key principals of ethical behavior should be considered and applied both before, during and after the interviews is conducted. Bell and Bryman (2007) stated that informed consent is “(...) the need to ensure the fully informed of research participants” (Bell & Bryman, 2007,

p. 71). The informed consent is something that the participants received before participating in the interview (see *appendix 1*).

Moreover, a misrepresentation of the assignment's content and purpose is also an ethical concern to consider. Therefore, to make our respondents safe, we have informed them of how, what for and for how long the information will be handled. In particular, an application has also been sent to NSD (Norwegian Center for Research Data), where the collection of information has been approved according to given guidelines. The application has been approved on the basis that no sensitive information is to be obtained, and the study does not come into conflict with other legislation or rules for privacy (see *appendix 2*). In addition to this, all respondents will have to say they are willing to participate, ahead of the interview process. Furthermore, participants in the study will also be able to withdraw their statements at any time, if they no longer feel comfortable in the situation. As a final assurance, the respondents will also be given access to be able to see the content of the assignment and, if necessary, request correction of the information provided.

4 Results

In this chapter, the respondents and collected data will be presented. In fact, the collected data and the variables from our theoretical framework will be linked to the overall research problem, as well as the research questions. Initially, we give a brief explanation of our respondents. Afterwards, we present the findings that have been made in the research and that have emerged through interpretation and analysis of the cases together to find the similarities and differences.

4.1 Presentation of respondents

The table below gives an overview of the various respondents we have interviewed. The table includes the respondent number, the company/organization name, and a brief description of the company/organization.

Table 2: Overview and description of respondents

Respondent	Company/ expert	Short description of the company/expert	Time spent (min)	Location for the interview
R1	Expert	Professor, Industrial Economics and Technology Management	30 min	Digitally
R2	Expert	Special adviser in Industry and Service Industries	30 min	Digitally
R3	Hydro	Hydro is a multinational aluminum and renewable energy company. The company are one of the world's largest producers of aluminum products, including extruded profiles, rolled products, and primary aluminum. In addition to its aluminum operations, Hydro is also involved in the production of renewable energy, including hydropower and wind power (Hydro, n.d.-a). The company's mission is to create a more sustainable future by developing innovative solutions for reducing carbon emissions and promoting sustainable development (Hydro, n.d.-b).	60 min	Physical
R4	Hydro		60 min	Physical
R5	Lerum	Lerum is a food and beverage company that specializes in the production of lemonade/syrup, jams, soda, and juices (Lerum, n.d.-b). Founded in 1907, the company has a long history of creating high-quality products using locally sourced ingredients. Lerum is recognized for its innovative approach to product development and its commitment to sustainable practices, including the use of renewable energy and environmentally friendly packaging (Lerum, n.d.-a). With a focus on quality and taste, Lerum has become a popular household name in Norway and continues to expand its reach internationally.	50 min	Digitally
R6	Eramet Norway	Eramet Norway is a subsidiary of the French mining and metallurgical company Eramet that focuses on special steel, manganese and nickel. The company operates processing facilities in Sauda, Kvinesdal, and Porsgrunn, along with an R&D group in Trondheim (Eramet Norway, n.d.-a). Eramet Norway is recognized for its expertise in the development and manufacturing of advanced materials, as well as its commitment to sustainable practices and environmental responsibility (Eramet Norway, n.d.-b).. With a history dating back to 1910, Eramet Norway is a key player in Norway's industrial sector and a significant contributor to the country's economy (Eramet Norway, n.d.-a).	50 min	Digitally

4.2 The findings

This sub-chapter presents the findings of our research. We have chosen to structure our findings within the three different research questions: 1) Why is it important for businesses to focus on sustainable innovation from an external-relation perspective? 2) How does businesses implement process and policies to achieve sustainable innovation? and 3) How does sustainable innovativeness affect the companies' triple bottom line outcome? To best answer these research questions, we have selected the most relevant elements and quotes from the data collection in this section.

4.2.1 Why is it important for businesses to focus on sustainable innovation from an external relation perspective?

Status of sustainable innovation in industrial businesses

There has been a significant increase in interest towards sustainable innovation. All the six respondents confirmed their familiarity with the term sustainable innovation when they were asked. The respondents shared quite a similar understanding of the term sustainable innovation. For the various respondents, it is about finding a balance between different dimensions - considering both environmental and social aspects while ensuring profitability. Three of the respondents defined sustainable innovation as “innovations that take the triple bottom line (TBL) into account - this means people, planet, and economy”. While one respondent defined sustainable innovation as “the research, development and implementation of solutions that lead to sustainability”. These definitions of sustainable innovation highlighted by the respondents emphasise the importance of integrating either the triple bottom line (TBL) or sustainability in the innovation process in industrial businesses, and this also agrees with the literature obtained.

Industrial businesses have historically been criticized for their lack of attention to sustainability – particularly regarding the environmental impact. However, when the respondents are asked about industrial businesses work with sustainable innovation, the respondents overall agree that most industrial companies are involved with sustainable innovation in some capacity. According to respondent 1, industrial companies place a strong emphasize on sustainability:

“It is incredibly rare that I am in contact with, visit or meet companies that do not have some kind of sustainability program. It's almost as if you gain a bit of new faith in humanity when you do this, because there are an incredible number of exciting things going on all around and there is quite a lot of optimism among the Norwegian business community in relation to what they are going to achieve of this” (R1).

Hence, it appears that there is a great optimism among the business world when it comes to sustainable innovation – with most industrial companies actively pursuing it. Nonetheless, according to respondent 2, it is difficult to answer how companies think of sustainable innovations as they only see companies that seek them. The respondent works with green platform and innovation projects in businesses (IPN) which has a lot of green applications. However, from the applications they receive, respondent 2 perceives that many companies are making a good effort in terms of the environmental shift. In relation to these applications, we are talking about substantially large sums.

“Green platform offers large-scale projects with funding support ranging from NOK 30 to 80 million over a period of three years, making it a significant amount of money” (R2).

There is, however, very strict frameworks when it comes to who gets support or not. According to respondent 2, they receive award letters from the ministry that require supported research projects to align with transition goals, including specific emission reductions by 2030 and Norway becoming a low-emission society by 2050. Nevertheless, respondent 2 maintains that it is not difficult to meet these requirements, as the vast majority of project applications are positive in terms of climate and the environment in some way. Based on this, one can interpret that companies have a greater focus on sustainability.

Furthermore, when the respondents from the different industrial businesses are asked about their work with sustainable innovation, it appears that industrial businesses have put a lot of thought and effort into this. The following quotes are representative for the industrial businesses:

“After all, Hydro works a lot with it - it is clearly included in our strategy. (...). In our overall vision strategy, we talk about profitability and sustainability. We believe that we must be good at both in order to be robust for the future - we will not be good at profitability if we are not good at sustainability - it goes hand in hand” (R3).

“In recent years, we have gone from being average in terms of sustainability to being at the very top in terms of sustainability for our industry, which is the metallurgical and mining industry” (R6).

Industrial businesses` work with sustainable innovation

Overall, industrial businesses are clearly committed to sustainable innovation. In our research, each industrial business has incorporated sustainable innovation into their operations. However, the ways in which the various industrial businesses pursue sustainable innovation differ. The respondents provide several specific examples of how they invest in sustainable innovation. Respondent 3 especially highlights the aluminum recycling project that Hydro has started, using recycled aluminum in their production process. This recycled aluminum lowers the CO₂ footprint, as opposed to producing new aluminum.

“We are currently implementing what we call (...) recycling, where eventually we will bring in 25,000 tonnes of scrap. As there are significant quantities, this results in a significantly lower CO₂ footprint in our end products” (R3).

Additionally, respondent 3 mentioned that Hydro sells a product called REDUXA, which guarantees a carbon footprint of 4 kg of CO₂ per kg of aluminum produced. Comparing this with the world average of 16.6 kg of CO₂ per kg of aluminum (see figure below).

Furthermore, the plan is to continue reducing their carbon footprint to 3.0 and eventually 2.0. Respondent 4 added that Hydro is working on reducing these CO₂ emissions in several areas, such as recycling (which is mentioned above) and capturing CO₂ from their electrolysis process. They are also researching a new completely CO₂-free aluminum production method, which Hydro will test.

We provide products produced with low emissions

Kilos of CO₂e emissions per kilo aluminium

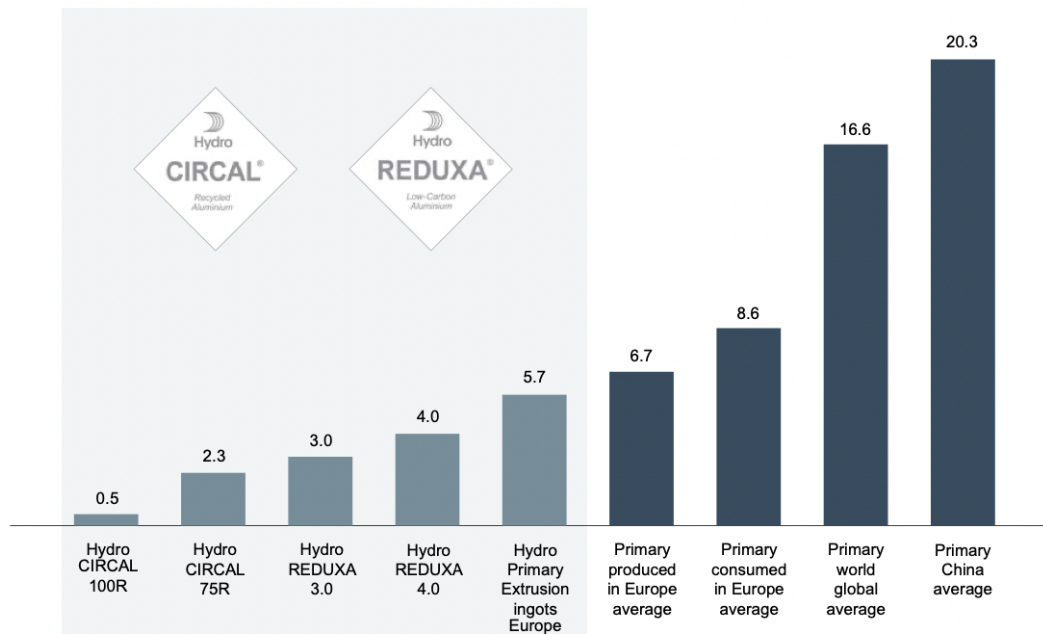


Figure 11: Greener products: From REDUXA 4.0 to 2.0

(Hydro, 2023, p. 11)

Furthermore, respondent 5 mention various aspects of sustainable innovation in Lerums work, particularly in innovating towards a more sustainable packaging and transportation solutions for their industry. The respondent highlights:

“Now we get what I call “test tubes”, which is made of about 30 grams of plastic at a height of 10 cm with a finished threaded section on top. We put these tubes in a machine that can blow them up into different types of bottles, and they take up only about 5% of the footprint in volume. By implementing this, we saved approximately 500 trailer loads per year or something like that” (R5).

While respondent 6 highlights two important projects that Eramet Norway is working on, when it comes to sustainable innovations. Among them are carbon capture storage (CCS) and bio-carbon. According to respondent 6, Carbon Capture Storage involves capturing the exhaust gas from the manganese alloy, which, upon combustion, produces CO₂, one of the most significant greenhouse gases. Carbon capture aims to concentrate this CO₂ to a level that allows for its transportation and storage in oil reservoirs.

“It is one of the most promising ways to reduce our CO₂ footprint” (R6).

In addition to this, respondent 6 also presents their work with bio-carbon. There is no one else in the world that uses biocarbon in the production of manganese alloys in large furnaces today. According to respondent 6, a successful implementation of these two projects can lead to significant CO₂ emission reductions in their production.

Industrial companies are actively engaged in sustainable innovation, as evidenced by the numerous ongoing projects. Respondent 4 notes:

“The fact that everyone is now working somewhat in the same direction, perhaps slightly different measures and slightly different pace, but everyone is working somewhat in the same direction at the same time - that makes it much easier to achieve” (R4).

Nevertheless, there is a big difference in how far the various industrial companies have come when it comes to sustainable innovation. While some businesses have only recently started working on sustainable innovation, others have been engaged in it for many years. Therefore, the change taking place are of a different nature for the various industrial businesses.

Respondent 1 stresses that it is a scale, when it comes to industrial businesses that work with sustainable innovations. At one end of the scale, many companies have only recently started working with sustainable innovation, resulting in small programs and modest objectives initially. This is due to the need for these companies to first establish organizational acceptance. At the other end of the scale, it is the established industrial companies that have made significant progress with sustainable innovation. They strategically position themselves in the market and raise the minimum requirements for their industry.

In contrast to, respondent 2 experience that there is a good mix of businesses that seeks them. The respondent states that, "We have conducted some statistical work and found that roughly 1/3 of the companies seeking the green platform are small (under 10 employees), 1/3 are medium-sized (10 employees to 100 employees), and 1/3 are large (over 100 employees)". As a result, the projects involve a wide range of businesses. Respondent 2 also mentioned that “sorting is not as good for BIA or industry and service industries, but they have a target of allocating 40 percent of the funds to new applicants”.

Furthermore, often it is the entrepreneurial businesses work with innovations, however, in this case it is opposite. Respondent 1 argue that this sector differs from other sectors when it comes to innovation:

"Often, major technological changes in society are brought about by new companies, which is why entrepreneurship is often emphasized in innovation. However, in the industrial context, it seems that older and larger companies are more advanced in sustainable innovation" (R1).

In our research, we spoke to three relatively large industrial companies. These industrial companies seemed to have done extensive work when it comes to sustainable innovation. The question is whether small or medium-sized industrial companies have come as far.

The importance of working with sustainable innovation

Based on the findings above, it is clear that the industrial companies we have spoken to works with sustainable innovation. In addition to working with sustainable innovation, our respondents emphasized the importance of working with sustainable innovation. The quotes below illustrate this:

"The more a change will benefit them (the companies), or a lack of change will be a threat to them, the easier it is to change" (R2).

"We believe that those who sleep in class and don't do anything about it now, will fade away or disappear" (R6).

Although industrial businesses recognize and participate in sustainable innovation, there are numerous dimensions to consider when assessing the significance of sustainable innovation. The most frequently mentioned aspect is the economic element. The respondents express that it is important for industrial businesses that the integration of sustainability don't hinder economic development. Respondent 2 state that "Ultimately, companies may decide to take no action if they do not perceive it as economically beneficial". According to respondent 6, company's prioritize financial sustainability, while believing that sustainability is crucial in the future. Respondent 6 elaborated:

"As a private company, we cannot operate without considering the financial aspect of our activities. Therefore, we ensure that all our actions are financially sustainable.

When it comes to sustainability, we are completely convinced that sustainability is the future and will in the long term in any case ensure good financial outcomes” (R6).

The economic element seems to be one of the most important drivers of sustainable innovation today. Many of the respondents also express that sustainability is necessary to be profitable in the future:

“We believe that we must be good at both in order to be robust for the future - we will not be good at profitability if we are not good at sustainability” (R3).

“Eramet is directing all of its efforts towards achieving a sustainable future, as we strongly believe that this approach is financially beneficial in the long run” (R6).

Furthermore, another important dimension of sustainable innovation that is closely related to the economic elements is competitive advantage. Many respondents mentioned sustainable innovation as a prerequisite for competitive advantage.

“We will not be competitive if we cannot succeed with sustainability” (R3).

“Sustainability is no longer just a basic requirement, but a competitive advantage in today's business world. Failing to achieve it in a satisfactory way may result in long-term losses” (R5).

The importance of sustainable innovation from an external-relation perspective

There are, however, other dimensions as well, when it comes to the importance of working with sustainable innovation. We are especially focusing on the external-relation perspective, and it is clear that engaging with external stakeholders is important. According to respondent 1, the main drivers for sustainable innovation in industrial businesses come from externals:

“It is observed that the driving force behind sustainable innovation in the industry is the expectation and demand from external stakeholders, leading to a set of requirements that must be fulfilled.” (R1).

The respondents believe that there are several external stakeholders who are important in their focus on sustainable innovation. The majority of respondents highlighted customers and regulations as the primary external stakeholders influencing their work in sustainable innovation. However, a few respondents also mentioned the significance of society, while

one respondent mentioned supplier, and another highlighted the importance of investors and banks.

Meeting demands from customers

Meeting demands from customers is the most prominent driver emphasized by all the respondents when it comes to external stakeholders. This is one of the first step towards industrial businesses' focus on sustainable innovation. Respondent 1 stated that:

“Customers are the driving force, especially in the industrial sector, where environmental requirements must be met to participate in tender rounds and deliver various services and products” (R1).

Similar to respondent 1, several of our respondents emphasize the significance of prioritizing customer's demands. In terms of this, respondent 3 emphasize the importance of meeting customers' demands in order to be able to compete in the global market. Additionally, respondent 4 argue that meeting sustainability expectations has become crucial for businesses to remain relevant to customers in the future. Businesses who fail to meet these sustainable expectations from customers can result in losing customers to competitors who do prioritize sustainability. Respondent 4 explained:

“In recent years, a lot has developed in relation to what customers expect from us, so that if you do not have good performance when it comes to sustainability, you are not included - if you think a few years into the future, you are out, I simply think” (R4).

Some of the respondents indicate that customer demand drives industrial businesses to focus on sustainable innovation, and failure to respond to these demands could result in significant consequences for companies that depend on selling their products and services. In recent years, customer's expectations have evolved. According to respondent 3, in the past customers was not as willing to pay for green products, but now there is a growing desire for such products in the market. Customer therefore expect businesses to prioritize sustainability. Most respondents have noticed that customers show a greater interest in sustainability, indicating its growing importance. Respondent 4 states that, when there is a demand for sustainable products and services, it spreads throughout the value chain and eventually affects their business. Respondent 3 stated:

“As the demand for sustainability grows, particularly from customers who are becoming increasingly clear about their expectations, we must prioritize sustainability. Failure to do so can have significant consequences, as we no longer will be competitive if we cannot succeed with sustainability” (R3).

Based on answers from the respondents, it appears that there is a considerable demand from customers for more sustainable products and services. Businesses are dependent on selling; therefore, customers are important for businesses. Respondent 6 suggests that customers' demands will eventually become a long-term requirement for businesses that rely on selling. This sentiment is echoed by respondent 5, who notes that many of their customers set guidelines for their company to follow. However, in the end, according to respondent 3, it all comes down to what the customer is willing to pay for. More and more customers are willing to pay more for products and services that are more sustainable. The quotes below are representative:

“The customers' awareness of sustainability is so high that they are willing to pay a slightly higher price for it, and this attitude makes it easier for us to work with sustainability” (R4).

“Several contracts with customers are now falling into place, possibly due to the fact that we demonstrate abilities and willingness to work in a sustainable direction. We are already present in the market with a significant amount of sustainable products, which allows them to meet customer demands and sign new contracts” (R4).

Meeting regulations

In addition to meeting customers demands, our respondents also emphasized the importance of meeting regulations. The respondents highlighted that industrial companies must consider sustainable innovation due to the emergence of stricter laws and regulations. Below are some of the statements made by the respondents:

“What drives development within sustainable innovation in industry is an expectation from external players and that a set of requirements must be met. This comes both from international regulations such as taxonomy and the EU. It comes from national regulations in relation to how Norwegian policy is challenged and needs to be improved” (R1).

“You also have external factors such as our legislation, which come in the form of SF plastics and the UN's climate goals and all these things here that have come locally in Norway” (R5).

“The other is the authorities. The fact is that the EU has put in place some clear climate targets as a consequence of the Green Deal, which includes regulations and financial incentives aimed at reducing our climate footprint” (R6).

There is therefore a real pressure among industrial companies to implement legislation. However, we will revisit this topic later. Apart from customers and regulations, other external stakeholders such as society, investors, banks, and suppliers were also mentioned by different respondents. Therefore, it is worth mentioning these stakeholders below.

Taking into account the society is another important dimension that is mentioned by one of the respondents. Respondent 6 stated that the company is not isolated in a bubble. Therefore, it is crucial to show responsibility and leadership towards sustainability to continue operating in Norway. Furthermore, another respondent also mentioned investors and banks as an important external stakeholder. Respondent 6 states that investors and banks are increasingly looking at the sustainability aspects of companies, and this can affect a company's ability to attract capital. The company are dependent on investors wanting to invest in them, if they are not able to operate and develop. Lastly, respondent 5 mentioned suppliers as another important external stakeholder that can drive sustainable innovation. Here, respondent 5 wishes that more suppliers focus on innovation, particularly on more climate-friendly solutions. This where it all begins, the respondent thinks that having sustainable raw materials can have a ripple effect throughout the entire value chain. Unfortunately, suppliers are not always as cooperative as they would hope, which tends to impede progress in this area. However, there are, some suppliers who are very prominent on that side.

Collaboration with external stakeholders

Another important element of the external-relation perspective of sustainable innovation is collaboration. Some of the respondents mentioned the importance of collaboration with external stakeholders, among them with customers and suppliers.

In the context of innovating for sustainability, collaborating with customers is highlighted by some of the respondents as particularly important. The collaboration involves understanding

the customer's expectations and needs. Through continuous dialogue with customers from the ideation phase to the final product, businesses can create solutions that are more likely to meet customer demands and expectations.

“After all, we have very close cooperation with our customers in relation to reaching these climate targets, which Hydro has set” (R3).

“Collaboration with customers is the foundation of all innovations. Very little progress is made, and few ideas come to realize without close and continuous dialogue with customers, starting from the ideation phase and continuing until the product is fully developed.” (R5).

In addition to customers, respondent 5 mentions the importance of collaboration with suppliers. Respondent 5 believes that there is room for improvement in the collaboration with suppliers, especially with regard to climate-friendly solutions. Although some suppliers are already making significant progress in this area, there is still scope for increased engagement and cooperation to more sustainable solutions. By collaborating with suppliers, the respondent sees the advantage of sharing ideas: “(...) get the good ideas from our suppliers”.

More than just the external-relation perspective

The respondents have indicated that the importance of sustainable innovation for industrial businesses is much dependent on the external-relation perspective, more particularly different external stakeholders. However, some of the respondents have also mentioned internal stakeholders. The respondents believe that there are several internal stakeholders that are important in their focus on sustainable innovation. The majority of respondents highlighted *employees* as an important internal stakeholder. Some respondents also mentioned *leaders* and *owners*.

There is a focus on the employees in the companies, and we clearly see from the companies that they want to inspire, motivate and include their employees at all levels. Something that can also affect well-being and motivation.

“But then the employees start making quite clear demands” (R3).

In relation to inclusion to levels, respondent 3 also adds:

“(...) And when you get the clear strategy out into the organization, you start to get that competitive instinct, and then it starts to become motivating” (R3)

Furthermore, respondent 5 explains how they include employees, for a better outcome:

“(...) continuous improvement group, where we work with the employees, where they can provide input in their areas.” (R5)

Additionally, the respondent talks about a case where the employees played a major role in a decisive implementation of a new process/ solution.

“We saved over NOK 3 million, directly related to how we involved those who will run the line.” (R5)

Moreover, respondent 3 mention the owners as one of the biggest drivers. The owners set goals and direction for the company. Lastly, respondent 1 mentioned the significance of leaders. The respondent refers to the concept of "personal identification", which highlights the significance of managers who personally value sustainability. Such managers are more likely to prioritize sustainable innovation within the companies they lead, increasing the probability of successful implementation.

Different perspectives on sustainable innovation: self-fulfilling?

Some of the respondents discusses the importance of the various perspectives when it comes to sustainable innovation. The question is on whether the economic, external, or internal perspective holds greater importance in sustainable innovation. According to respondent 1, the different perspectives can be self-fulfilling. Respondent 1 elaborated:

“Determining what truly matters the most here is methodologically challenging, and it could be a self-fulfilling process where the various aspects complement and drive each other forward” (R1).

Respondent 4 partially supports this idea. The respondent mentioned that there is a growing emphasis on sustainability among the respondents, which has resulted in increasing pressure on companies to work towards sustainable innovation from all sides. Respondent 4 further explains:

“It is evident that climate change has become a growing concern in society, and measures to address it are being increasingly understood and emphasized from all sides” (R4).

All companies are aware of the need to comply with sustainability requirements. The respondents in our research are no exception and work to stay ahead of such requirements from various perspectives. Respondent 4 explains this well:

“Hydro is not sitting around waiting for external measures to be thrown at them. They are actively working on improving themselves and are therefore very much self-driven in this process” (R4).

4.2.2 How does businesses implement process and policies to achieve sustainable innovation?

The implementation of processes in order to achieve sustainable innovation

When it comes to implementing processes to achieve sustainable innovation, the answers of different respondents have varied. Respondent 1 highlights sustainable innovation is largely integrated with other innovation activities in industrial companies, making it difficult to distinguish between the two.

“We are now witnessing a trend where sustainability is largely integrated with other innovation activities in companies. It is becoming rare to see companies with separate sustainability initiatives” (R1).

According to respondent 1, sustainability is now incorporated into board work, investment decisions, and other development processes, indicating a shift towards greater integration of sustainability in company operations.

Furthermore, respondent 5 explains the implementation process for sustainable innovation. The respondent describes that they work according to a funnel principle. This process involves generating a large number of ideas, which are then evaluated and refined through a three-step process. This process includes several loops where ideas are rejected or taken further based on their potential for success. The emphasis is on doing the least amount possible and not investing too much time or resources in innovations that may not be viable.

“The goal is to be able to stop an innovation that does not have a strong potential for success without having wasted significant time or resources” (R5).

Similarly, respondent 6 elaborates on their process for sustainable innovation. The respondent highlights their innovation process when it comes to their work with carbon capturing (CCS). The respondents explained that this process started with literature and theory on existing technologies in order to find the best technology available. Through collaboration, the most relevant technology was identified, and an agreement with a supplier of the technology was concluded. Further, according to respondent 6 they are waiting to receive a pilot to test of the technology:

“Through this partnership, we secured funding from ENOVA to carry out a pilot program at our Sauda plant in Western Norway. This initiative, scheduled for 2024 and 2025, will provide us with the essential technical knowledge and data to determine the viability of a full-scale CCS or carbon capture plant by 2028” (R6).

The process for sustainable innovation is, therefore, relatively long. As respondent 6 expressed above, the innovation processes involve several steps, beginning with a review of relevant literature and theory, followed by the selection of appropriate technologies, pilot testing, as well as the implementation and scaling up of the innovation.

Benefits of implementing sustainable innovation and new technological solutions

Whether the companies experience benefits linked to the development and implementation of sustainable innovation and solutions is clear. On the other hand, there were varying answers as to which benefits they believe come from this type of activity.

In the context of dialogue around a case, the following answers were given for the benefits that can arise from implementation.

“Experiences, you can hardly measure that in money, and we try to avoid making the same mistakes again” (R5).

Also, in terms of competitive advantages and the choices of sustainability, R5 emphasis how these choices create an identity and a good reputation. Moreover, the respondent's from Hydro explains the benefits of implementation of sustainable innovations and new technological solutions in a bit different direction:

“There are also some contracts with customers that are falling into place now, probably largely as a result of us showing the abilities and willingness to work in that direction.” (R4)

R4 emphasizes the focus on being able to deliver products that the customer and the market demand. This also highlights the effect of competitive advantage, as R5 mentioned. In addition, respondent 3 also adds the following environmentally friendly benefit:

“(…) and we will reduce CO2 emissions.” (R3)

In the context of implementation of new sustainable innovations and solutions.

On the other hand, we can see that several of the respondents from the study refers to the fact that recruitment and the sustainable activities is a benefit that occur:

“I would perhaps like to emphasize a point about the fact that sustainability is also a prerequisite for us to recruit young talent.” (R6)

“We work very consciously with things like that, everything from work performance at professional operator level to technology development and new solutions – it appeals to many different professional groups and it's an important part of recruitment and the future, I think.” (R4)

In relation, how work performance unfolds, can be decisive for how much goes to wasted or how much CO₂ emissions you get. More specifically, it is important (for large companies such as those we have interviewed) that work is carried out with precision. If precision is in the back of your mind during execution, then, the training of new employees also has a good impact. This can translate into a stronger motivation for the employees and a great work environment.

The implementation of policies in order to achieve sustainable innovation

We have briefly discussed policies earlier in this chapter, but now we aim to delve deeper into the topic. Policies provide some kind of framework for industrial businesses to operate within and can incentivize companies to adopt more sustainable practices. Therefore, the respondents talk a lot about the implementation of policies when it comes to sustainable innovation. Respondent 2 informs:

“I think industrial businesses' starting point for conducting sustainable innovations varies. It may for example be in order to meet requirements that are statutory, requirements from the industry itself or other stakeholders, or more opportunistic like acting on customer demand” (R2).

Industrial businesses have to deal with policies to a great extent. The respondents in the discussion of sustainable innovation often refer to policies such as regulations. During the discussion of sustainable innovation, the respondents frequently mentioned regulations as a key external factor that they must implement. The respondents frequently mentioned it as one of the primary factors. According to respondent 1, these regulations includes both international and national regulations. Many industrial businesses have implemented various regulations. There, are several regulations that are mentioned by the respondents in this context. Each of the respondents mentions different regulations that affect them, among them are the UN's sustainability goals, the taxonomy, the European Green Deal, The Paris Agreement, The EU Emissions Trading System and SF plastics.

There can be positive aspects in implementing the various regulations into industrial businesses' work with sustainable innovation. Some of our respondents thinks that regulations are a motivating factor, especially economically. According to respondent 3, the regulations can serve as a strong financial motivation, in addition to being crucial for the environment. Respondent 3 especially points out the quota system (the Eu Emissions Trading System). Similarly, respondent 4 also experience the motivating factor of the regulations, this means that there are more industrial companies that take actions. According to respondent 4, this actually works. Furthermore, it can be considered that the Norwegian authorities contribute to an easier implementation of sustainable choices and solutions. For instance, the increased prices for recycling. In fact, an increased price helps to ensure that more of the plastic can be recycled. This supports the statement of respondent 5:

"We know how much of our products is recycled into the infinity sum, the recycling scheme that we have here in Norway (...) and we almost have a closed loop" (R5).

Furthermore, several of the respondents talk about their commitment to the Paris Agreement, Respondent 3 stated:

“Hydro has said that we will be climate neutral in 2050, which means that we will not have a CO2 footprint on what we produce in 2050 - and that is not long away!” (R3).

“We have actually committed ourselves through the Science Based Targets Institute to achieving these climate targets. If we don't manage them, there will be adverse consequences, in particular for investors.” (R6).

Several respondents acknowledge that meeting certain regulations within the given timeframe is challenging. This includes the Paris Agreement, which some feel may be difficult to achieve by 2030. Respondent 2, for example, notes that a typical project takes four years to develop, which means that we are already approaching 2027. Given this, meeting the goals set for 2030 may not be feasible. Nonetheless, there is still a pressing need to act urgently, even if the 2050 target seems more attainable due to its longer timeframe. Respondent 5 points out the importance of honest communication. The respondent explains that they, as well as other companies acknowledge that they need more time to achieve these regulations. To meet the goals set by the UN and the EU, therefore, honest communication is important.

However, not all respondents agree that these climate targets are difficult to achieve. Respondent 6 feels that it is feasible:

“We believe it is feasible, although we think it is very challenging and there is a great deal of uncertainty associated with it” (R6).

According to respondent 6, they are making significant efforts to achieve the climate goals, and in the upcoming months, there will be updates regarding CCS and bio-carbon. These two measures are crucial in achieving our goals within the 2030 timeframe. As we move closer to the 2050 perspective, respondent 6 intends to utilize hydrogen with innovative techniques that could potentially serve as a replacement for bio-carbon.

Furthermore, there is also another regulation, the EU Emission Trading System, which is briefly mentioned. According to respondent 3, industrial companies have to pay quite a lot for CO₂ emissions in regard to this system. In relation to, respondent 4 explains that one of the challenges with this regulation is getting a de-escalation plan that matches what is technologically achievable. Getting the two curves to meet at the right level on the timeline is probably something that the EU also has to work on a bit. According to respondent 4, this is because implementing sustainable solutions is not as simple as buying off-the-shelf products or having investment funds, it requires actual development.

As a result of these strict regulations linked to the industrial businesses, some of the respondents are afraid of the consequences. Respondent 4 stated:

“The European industry runs the risk of ending up in a state of disarray, which will not benefit anyone. If green metal is not produced in Europe, then those who demand metal will turn to other manufacturers with far less environmentally friendly mental” (R4).

This would be the worst possible outcome from an environmental standpoint. Therefore, according to respondent 4, EU must exercise caution and not push too hard to expedite the process. If they do, it could result in the industry falling into disarray. However, a close dialogue with Norwegian and EU authorities is in place to address such issues.

4.2.3 How does the sustainable innovativeness affect the companies' triple bottom line outcome?

Sustainable innovation and the triple bottom line (TBL)

As mentioned initially, some of the respondents defined sustainable innovation as innovations that take the triple bottom line (TBL) into account. This emphasize that businesses need to consider both the environmental and social dimensions, alongside with the economic dimension. However, there is a general consensus among the respondents that Norwegian industrial businesses tend to focus more on the environmental and economic aspects, with the social dimension being relatively fulfilled. Respondent 1 elaborated:

“When researching sustainable innovations, it becomes clear that they can be broadly categorized into environmental innovations dealing with resource use, energy, emissions, and climate issues, and social innovations focused on issues like tax payments, workers' welfare, transparency, and more. It is observed that prioritizing environmental concerns can greatly enhance a company's competitiveness, whereas social concerns have a relatively lower potential to increase competitiveness” (R1).

Based on this, it may indicate that much of the focus among industrial companies is on the environmental side of the triple bottom line (TBL). Respondent 2 supports this:

“In my experience and in the Norwegian context, the term "sustainable innovation" often evokes thoughts of the environment and climate, with the social and financial aspect being implicit” (R2).

The industrial companies we have interviewed have shown a clear emphasis on the environmental aspect of the triple bottom line. Their attention appears to be predominantly directed towards this area in their work with sustainable innovation. There may be several reasons for this, but respondent 1 highlights that this may be reflection of what the society looks like. In Norway, companies have good control over the social part of the triple bottom line. While there are significant opportunities for improvements when it comes to the environmental aspect in these companies.

5 Discussion and implications

In this chapter we will discuss the theoretical framework against our findings. The following sub-chapters are organized based on the research questions addressed in the thesis.

5.1 Why is it important for businesses to focus on sustainable innovation from an external-relation perspective?

There is a significantly increased interest in sustainable innovation (Cillo et al., 2019; Boons et al., 2013). Sustainable innovation is defined in many different ways in the literature. According to (Bos-Brouwers, 2010), sustainable innovation is “innovations in which the renewal or improvement of products, services, technological or organizational processes not only delivers an improved economical performance, but also an enhanced environmental and social performance, both in the short and long term. Similarly, Boons et. al (2013, p. 2) defined sustainable innovation as "innovation that increases sustainability performance," where "performance" comprises environmental, economic, and social factors. In this research, all the respondents possess knowledge about the term sustainable innovation. The respondents had a similar understanding of sustainable innovation, which involves finding a balance between environmental and social aspects while ensuring profitability. Three of them defined it as innovations that consider the triple bottom line (TBL), which includes people, planet, and economy. Meanwhile, one respondent described it as research, development, and implementation of solutions that lead to sustainability.

There are thus various definitions of sustainable innovation, but it is evident that concept is generally understood in a similar manner. Overall, it typically refers to innovations which improve social and environmental performance in addition to economic performance.

5.1.1 Discussion of industrial businesses work with sustainable innovation

Our findings suggests that industrial businesses are dedicated to sustainable innovation, with a noticeable trend towards sustainability in this sector. From the theory it emerges that businesses play a crucial role in promote sustainability and tackle challenges such as climate change, resource depletion, and social inequality. However, industrial businesses are often

perceived as the primary contributors to these issues, leading to a severe lack of sustainability in society (Lozano, 2012, Schaltegger & Wagner, 2011, Thakur & Gupta, 2012). For instance, in 2021, oil and gas extraction contributed approximately 12.1 million tonnes of CO₂ equivalents in greenhouse gas emissions, while industry and mining accounted for approximately 11.7 million tonnes (Statistics Norway, 2022).

Our research shows that each industrial business has incorporated sustainable innovation into their operations. This is consistent with the theory in which industrial businesses acknowledge the potential for sustainable innovation within their industry, including the development of new business models, products, and technologies (Kneipp et al., 2019; Proses21 Ekspertgrupperapport, 2020). In the findings, the industrial companies mention sustainable innovations such as the recycling of aluminum and carbon capture storage (CCS). However, the ways in which the various industrial businesses pursue sustainable innovation differ. The findings indicate that it is a scale for sustainable innovation in industrial companies, with some companies starting small to establish acceptance, while established companies strategically position themselves and raise industry requirements. Some respondents have therefore experienced that, older and larger companies are more advanced in sustainable innovation in an industrial context, despite the fact that it is often entrepreneurial companies that are largely responsible for major innovations in other sectors.

5.1.2 Discussion of the importance of working with sustainable innovation

The findings reveal that sustainable innovation holds significance for industrial companies, and there is a noticeable trend towards sustainability in this sector. Through our findings, it turns out that the importance of sustainable innovation is multifaceted, with economic considerations being one of the most frequently mentioned dimensions. While economic development should not be impeded by the integration of sustainability, our findings emphasize that sustainability is crucial for long-term profitability and success. This is supported by Eccles et al. (2014), who found that companies that incorporate sustainability into their strategies and core business processes achieve better financial performance and have a higher likelihood of long-term survival.

The importance of sustainable innovation can also be viewed from the perspective of competitive advantage. Sustainable innovation is a prerequisite for competitive advantage.

This notion is supported by existing theories that suggest a significant and positive relationship between sustainable innovation and a business's competitiveness (Bacinello et al., 2019; Hermundsdottir & Aspelund, 2021; Qiu et al., 2020). Moreover, the findings suggest that sustainability is no longer merely a basic requirement but also a competitive advantage in today's business world, which is consistent with the theoretical framework. Early adoption of sustainable innovation can position businesses for a substantial competitive advantage in the business world of the future (Porter & van der Linde, 1995). Consequently, businesses that invest in sustainable innovation at an early stage are likely to gain a favorable position (Boons et al., 2013).

5.1.3 Discussion of the external-relation perspective in terms of sustainable innovation

The importance of external stakeholders when it comes to sustainable innovation is highlighted by all the respondents. Cillo et al. (2019) offer an extensive overview of the external-relation perspective in sustainable innovation, which refers to managing a company's external relationships.

Our findings show that sustainable innovation in industrial businesses is primarily driven by external actors' expectations and demands, resulting in a set of requirements that companies must meet. This is supported in theory, where it appears that external stakeholders have a crucial role in implementing sustainable practices (Bansal and Song, 2017; Cillo et al., 2019; Alkemade & Suurs, 2012; Seuring & Gold, 2013). The focus should start with inclusion of stakeholders and the integration of their respective demands (Alkemade & Suurs, 2012; Seuring & Gold, 2013). According to theory, businesses that incorporate the expectations of external stakeholders into their sustainability initiatives are more likely to attain financial and environmental benefits (Bansal and Song, 2017).

Furthermore, Harrison and St. John (1996) highlight the importance of considering multiple external stakeholders in a company's operations, particularly in the context of sustainable innovation. It emerges from the findings that customers and regulations are the most important external stakeholders for sustainable innovation. However, society, suppliers, investors, and banks were also identified.

Meeting customer demands plays an important role for industrial companies when it comes to sustainable innovation. The findings suggest that customers are the most prominent driver

when it comes to external stakeholders. Some of the respondent's explains that there are some contracts with customers that are falling into place, probably largely as a result of the companies showing the abilities and willingness to work in a sustainable direction. This is partly supported by theory, which points to identifying customer demands as one of the main drivers of sustainable innovation (Horbach et al., 2012; Qiu et al., 2020; Yalabik & Fairchild, 2011). Furthermore, it emerges from the findings that failure to meet customers' sustainable expectations can result in losing customers to competitors who prioritize sustainability, something that Ebrahimi & Mirbargkar (2017) also points out. There is a growing demand for sustainable products and services from customers, and businesses must prioritize this to remain competitive. This is supported by Schettle et. al. (2014), which stated that "[...] consumers can respond favorably to a firm's sustainability initiatives and innovation which creates demand and therefore is of highest importance." (Delmas and Toffel, 2004; Rivera-Camino, 2007; Schrette et al., 2014, p. 76) The findings suggest that customer demands will eventually become a long-term requirement for businesses that rely on selling. Many customers are willing to pay more for sustainable products and services, making it easier for businesses to work towards sustainability.

Regulations also play an important role for industrial companies when it comes to sustainability innovation. The findings suggest that highlighted that industrial companies must consider sustainable innovation due to the emergence of stricter laws and regulations. These findings align well with existing theories, as several studies have confirmed the importance of regulations as a critical external factor in promoting sustainable innovation. Businesses that are subject to regulations are more inclined to innovate sustainably compared to those that are not (Doran & Ryan, 2012; Hermundsdottir & Aspelund, 2021; Horbach et al., 2012). Furthermore, regulations are considered a motivator, especially in terms of economic benefits and gaining competitive advantages. However, it also appears that meeting certain regulations within the given timeframe is challenging.

Moreover, through our findings it appears that collaboration with external stakeholders is a key factor in achieving sustainable innovation, which is consistent with the theory proposed by Cillo et al. (2019) that emphasizes the importance of collaboration in driving sustainable innovation. Some of the respondents suggest the importance of collaborating with especially customers, but also suppliers. In particular, this is largely about meeting expectations and needs, as well as sharing ideas. Moreover, our findings suggest that working somewhat in the same direction is essential to achieve in sustainable innovation. This is supported by

Anttonen et al. (2013) and Cappa et al. (2016), who explain that due to the difficulty of achieving sustainable innovation within a single company, collaboration with other relevant companies is necessary.

Nevertheless, the findings also mentioned internal stakeholders. The respondents believe that there are several internal stakeholders that are important in their focus on sustainable innovation. The majority of respondents highlighted employees as an important internal stakeholder. Some respondents also mentioned leaders and owners. The subject of debate is, therefore, whether the external or internal perspective holds greater importance in sustainable innovation. The findings suggest that the different perspectives may complement and reinforce each other. However, one respondent notes that companies are not merely waiting for measures to be imposed upon them but are proactively working to improve themselves. There is therefore much evidence that it is a combination of the various perspectives that drives industrial companies towards sustainable innovation.

Table 3: Summary of key findings on research question 1

Variables	R1	R2	R3	R4	R5	R6
Sustainable innovation	+	+	+	+	+	+
Competitive advantages	+	+	+	+	+	+
Economical performance	+	+	+	+	+/-	+
External-relation perspective	+/-	+/-	+	+	+/-	+

+ Findings agree with theory

+/- Findings partly agree with theory

- Findings disagree with theory

5.2 How does businesses implement process and policies to achieve sustainable innovation?

5.2.1 Discussion of businesses' implementation of processes to achieve sustainable innovation

The findings indicate that sustainable innovation is largely integrated with other innovation activities in industrial companies, making it difficult to distinguish between the two.

Sustainability is now incorporated into board work, investment decisions, and other development processes, indicating a shift towards greater integration of sustainability in company operations.

The findings describe the processes as a funnel principle. This process involves generating a large number of ideas, which are then evaluated and refined through a three-step process.

This process includes several loops where ideas are rejected or taken further based on their potential for success. The emphasis is on doing the least amount possible and not investing too much time or resources in innovations that may not be viable. More clearly, the findings emphasize that the innovation processes involve several steps, beginning with a review of relevant literature and theory, followed by the selection of appropriate technologies, pilot testing, as well as the implementation and scaling up of the innovation. The processes for sustainable innovation can, therefore, be relatively long. This partly agrees with the Dalal-Clayton and Bass (2002) explanation towards what's needed for a process "to work", accordingly improving synergies, remove inconsistencies, avoiding conflicts, and fill the gaps.

The companies experience benefits linked to the development and implementation of sustainable innovation and solutions is clear. On the other hand, there were varying answers as to which benefits, they believe come from this type of activity.

The findings suggests that companies experience benefits linked to the development and implementation of sustainable innovation and solutions. The respondents, however, vary in their answers as to which benefits, they believe come from this type of activity. One respondent highlights the importance of experiences. Also, in terms of competitive advantages and the choices of sustainability, some respondents' emphasis how these choices create an identity and a good reputation.

In the context of benefits associated with the willingness to implement processes to achieve sustainable innovation, there was mentioned by several respondent the important influences on the recruitment element. The effort to developing and implementing new technology and solutions appeals to young talents and has been seen as a competitive advantage for the future. This also adds up with the findings from Maltais & Nykvist (2020) article, with pointed out the benefits of attracting both customers, staff, and skilled competence, as an competitive advantage.

Also, in terms of the environment, the reduction of CO₂ emission, is an important benefit from our findings. Moreover, how work performance unfolds, can be decisive for the environmental dimension. More specifically, it is important that work is carried out with precision. If precision is in the back of your mind during execution, then, the training of new employees also can have a good impact. This can translate into a stronger motivation for the employees and a great work environment – and long-term this can be a benefit towards less CO₂ emission.

5.2.2 Discussion of businesses' implementation of policies to achieve sustainable innovation

Policies play an important role for industrial companies. The findings shows that industrial businesses think a lot about polices when it comes to sustainable innovation, due to the emergence of stricter laws and regulations. The policies are becoming stricter with regard to the sustainability problems the world faces today. The majority of the respondents frequently mentioned it as one of the primary factors.

It emerges from the findings that regulations can be a strong economic motivator, offering competitive advantages and benefiting the environment. Consequently, more industrial businesses take action and achieve positive results. This is supported by theory, which states that environmental regulations can serve as a motivation for businesses to innovate towards sustainability. The resulting returns from these innovations can outweigh the costs incurred by companies when complying with environmental regulations. (Wu et al., 2022). Another theory suggests that such regulations can have a positive impact on a business's competitiveness and performance by promoting sustainable innovation within organization (Zefeng et al., 2018).

Nevertheless, from the findings it also appears that meeting certain regulations within the given timeframe is challenging. The challenge with regulation is getting a de-escalation plan that matches what is technologically achievable. Getting the two curves to meet at the right level on the timeline is probably something that the EU has to work on. The respondents explain that implementing sustainable solutions is not as simple as buying off-the-shelf products or having investment funds, it requires actual development. As a result of this, one respondent points out the importance of honest communication. They, as well as other companies acknowledge that they need more time to achieve these regulations. To meet the goals set by the UN and the EU, therefore, honest communication is important. However, not all respondents agree that these climate targets are difficult to achieve.

As a result of these strict regulations linked to the industrial businesses, some of the respondents are afraid of the consequences. The European industry runs the risk of ending up in a state of disarray, which will not benefit anyone. This would be the worst possible outcome from an environmental standpoint.

Table 4: Summary of key findings on research question 2

Variables	R1	R2	R3	R4	R5	R6
Processes	+/-	+/-	+	+	+	+
Polices	+	+	+/-	+/-	+/-	+

+ Findings agree with theory

+/- Findings partly agree with theory

- Findings disagree with theory

5.3 How does the sustainable innovativeness affect the companies' triple bottom line outcome?

5.3.1 Discussion of the sustainable innovativeness affect on companies' triple bottom line outcome

Based on the findings, it seems like sustainable innovations have an affect on business' triple bottom line outcome. The participants recognized a connection between sustainable

innovation and the triple bottom line, as a company's environmental and social performances can ultimately lead to improved financial performance. This is consistent with Weider et. al. (2021) findings, which also found that sustainable innovation plays a crucial role in contributing to the triple bottom line.

Nonetheless, our findings suggest that the industrial businesses tend to prioritize the environmental and economic dimensions, with the social dimension being somewhat fulfilled. This deviates slightly from the theory, which emphasizes the importance of focusing on all three dimensions (Elkington, 1994). However, this may indicate that the contribution to the triple bottom line outcome is not linear when it comes to sustainable innovation, as supported by Weider et. al. (2021). There may be several reasons for this focus, but one respondent highlights that this may be reflection of what the society looks like. In Norway, companies have good control over the social dimension of the triple bottom line. While there are significant opportunities for improvements when it comes to the environmental aspect.

Furthermore, through our findings the economic performance is frequently mentioned, as the company cannot operate without considering the economical aspect of their activities. However, the findings suggest that sustainability is a necessity in order to be profitable in the future. This viewpoint is reinforced by existing theory, which underscores the economic benefits of incorporating sustainability into business strategies (Eccles et al., 2014; Maletic et al., 2015; Wagner, 2010). The respondents, further state that sustainable innovation as a prerequisite for competitive advantage. This is supported by theory, which says that sustainable innovation can provide a competitive advantage in the market (Bacinello et al., 2019; Hermundsdottir & Aspelund, 2021; Qiu et al., 2020). Consequently, adopting sustainable innovation not only generates economic advantages but also strengthens overall the businesses economical performance.

Table 5: Summary of key findings on research question 3

Variables	R1	R2	R3	R4	R5	R6
Environmental dimension	+	+	+	+	+	+
Economical dimension	+	+	+	+	+/-	+

Social dimension	+/-	+/-	+/-	+/-	+	+/-
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+ Findings agree with theory

+/- Findings partly agree with theory

- Findings disagree with theory

6 Conclusion

This section contains a conclusion to the research, limitation, and lastly presents a recommendation towards further research.

6.1 Conclusion of research questions

To carrying out qualitative research requires time, and there is no numerical data that can be concretely measured. The conclusions are based on a comparison of explanations against questions that are asked, constructed from the literature obtained. Moreover, we have chosen a cross-case, in order to be able to look at the explanations against each other.

In this research, we have tried to answer these three research questions: 1) Why is it important for businesses to focus on sustainable innovation from an external-relation perspective? 2) How does businesses implement process and policies to achieve sustainable innovation? and 3) How does the sustainable innovativeness affect the companies' triple bottom line outcome?

6.1.1 Underlying research question one

The first research question, why it is important to focus on sustainable innovation from an external-relation perspective. It is clear that industrial businesses are dedicated to sustainable innovation, with a noticeable trend towards sustainability in this sector. To remain competitive, industrial businesses cannot afford to lag behind in terms of sustainable innovation, as doing so would result in losing their competitive edge.

Moreover, in terms of the external-relation perspective, it is important to meet the expectations and demands of external stakeholders, as well as the benefit connected to collaboration with external stakeholders. However, there are several internal stakeholders that are important in their focus on sustainable innovation. Hence, it can be argued that industrial companies are driven towards sustainable innovation by a combination of diverse perspectives.

6.1.2 Underlying research question two

The second research question in the thesis was to understand how the businesses' implements process and policies to achieve sustainable innovation. In particular, we see that the processes are being started, much based on guidelines/policies from the authorities. The policies can both be a motivational factor, however, they can also be difficult to achieve for industrial companies. Nevertheless, based on the answers, several businesses work a lot to develop and carry out innovation activities independently of imposed policies. Moreover, in terms of *how* these processes are implemented into the industry, the answers have some similarities. Obtain ideas, filter and select one or more ideas, develop, test, and finally implement and put the innovation into operation.

6.1.3. Underlying research question three

The third, and last, research question aims to explore how the sustainable innovativeness affect the businesses' triple bottom line outcome. The findings indicate that sustainable innovations significantly affect the triple bottom line outcomes of industrial businesses. However, the contribution to the triple bottom line outcome is not necessarily linear in the context of sustainable innovation. The industrial businesses tend to prioritize the environmental and economic dimensions, as the social dimension being somewhat fulfilled.

6.2 Limitations

A distinct limitation in this master thesis was the time-limitation. Due to the fact that there was a time limit just above four months (to carried out and completed the thesis). In particular, the first thing we had to start with was the thesis' research problem and associated literature, before we could prepare an interview guide for the selected respondents. Also, before we contacted the respondents, we had to get approval from Norsk senter for forskningsdata (NSD). Approval was allowed to wait for a whole month, which meant that there was hardly any time. In addition, not all respondents were equally quick to give feedback, wanted to participate, or gave any feedback. A limitation to this is the fact that we only had three businesses in our research. This means that our findings are limited, due to a small sample of respondents.

Another possible limitation for this research is the timing of the strike that occurred in Norway in April. Ahead of this, there was a lot of extra work associated with the situation, which made it more difficult to get participants to take part in the study. Also, one of the businesses, in relation, expressed that there was a bit of stress and workload connected to the situation.

Lastly, there has been a limitation due to the word-limits from the thesis formal instructions. In other words, we were not able to ensure the thesis with enough content as we wanted to.

6.3 Future research

In relation to further research, this is a highly relevant topic to look more into. One suggestion would be to observe the development among industrial businesses. In particular, it is most relevant to monitor the future towards 2030, where a climate target of reduced emissions is listed, which is not many years away. More specifically, to maybe do observation over time?

Conversely, we also got a tip from respondent 2 that there should be a greater focus on greenwashing, and who actually carries out climate measures and who just wants to appear sustainable? Overall, this is an interesting and important angle to illuminate.

Furthermore, since sustainable innovation is in continuous development, this is something that everyone must take into account. In our research, we spoke to three relatively large industrial businesses. Based on this, we see that it is the largest companies who probably have the most control and are in the driver's seat of development. These have all come a long way when it comes to sustainable innovation. However, in Norway, a large proportion of companies are between large ones, the question then is whether they have come this far. It would have been interesting to investigate. Therefore, it may be relevant to look at what the smaller companies are doing to create new and more sustainable innovations in order to achieve climate-neutral growth.

Moreover, our thesis research gap was the external perspective, but there are indications that the internal stakeholders have gained a greater focus on sustainable innovation. Furthermore, the answers from the respondents also indicate that sustainable innovation provides a competitive effect when it comes to recruitment, where an in-dept research could provide interesting findings.

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8 Appendix

Appendix 1. Information letter (in Norwegian)

Vil du delta i forskningsprosjektet: «Bærekraftig innovasjon»?

Formål

Formålet med dette forskningsprosjektet er å studere forholdet industribedrifter har til bærekraftig innovasjon, og hvordan de jobber med bærekraftig innovasjon. I dette informasjonsbrevet gir vi deg informasjon om målene for prosjektet og hva deltagelsen vil innebære for deg.

Forskningsprosjektet vil inngå i masteroppgaven til Ane Bjørk og Hanna Hestetun.

Vår overordnede problemstilling er å få en bedre forståelse av forholdet mellom bedrifters bærekraftige innovasjonspraksis fra et eksternt relasjonsperspektiv og dets tredelte bunnlinjeresultat. Følgelig er våre forskningsspørsmål:

Hvorfor er det viktig for virksomheter å fokusere på bærekraftig innovasjon fra et eksternt relasjonsperspektiv?

Hvordan implementerer virksomheter prosesser og retningslinjer for å oppnå bærekraftig innovasjon?

Hvordan påvirker bærekraftig innovasjon selskapets tredelte bunnlinjes resultat?

Hvem er ansvarlig for forskningsprosjektet?

Ansvarlig for forskningsprosjektet er Høgskulen på Vestlandet og veileder Parmita Saha. Dette forskningsprosjektet blir gjennomført av masterstudentene Ane Bjørk og Hanna Hestetun, alle ved Institutt for økonomi og administrasjon ved Høgskulen på Vestlandet.

Hvorfor får du spørsmål om å delta?

Studiets emner inkluderer de som forstår bærekraftig innovasjon i industribedrifter, enten gjennom sitt yrke eller på grunn av sin posisjon i selskapet. Studien består av to typer utvalg.

Hvis du leser dette informasjonsbrevet, faller du inn i en av følgende kategorier:

Utvalg 1 – Norske industribedrifter

Dette utvalget er trukket målrettet basert på informasjon og ulike kriterier knyttet til norske industribedrifter.

Utvalg 2 – Ekspert på feltet

Målrettet trekking utifra tilgjengelighet og kunnskapsnivå.

Hva innebærer det for deg å delta?

Deltakelsen i denne studien inneber å svare på spørsmål som relaterer seg til bærekraftig innovasjon i industribedrifter.

Denne undersøkelsen vil inneholde intervju. Det er tenkt at intervjuet vil vare ca. 60 min. Ved ditt samtykke vil vi benytte oss av en innspelingsenhet under intervjuet. Deretter vil intervjuet transkriberes. Du vil kunne få innsyn i transkripsjonen og eventuelle sitater som publiseres i oppgaven, og din identitet vil anonymiseres.

Det er frivillig å delta

Det er frivillig å delta i prosjektet. Hvis du velger å delta, 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.

Du kan trekke deg når som helst ved å sende e-post til kontaktperson: Ane Bjørk/Hanna Hestetun.

Ditt personvern – hvordan vi oppbevarer og bruker dine opplysninger

Vi vil bare bruke opplysningene om deg til formålene vi har fortalt om i dette skrivet. Vi behandler opplysningene konfidensielt og i samsvar med personvernregelverket.

Andre opplysninger som ikke inngår i prosjektet sitt formål vil bli behandlet konfidensielt, og din identitet vil ikke kunne gjenkjennes i datamaterialet. Det er kun masterstudentene som vil ha tilgang til informasjonen Ane Bjørk og Hanna Hestetun, i tillegg til veilederen vår Parmita Saha. Alle opplysninger vil bli beskyttet mot at uvedkommende får innsyn. Dette sikres ved at datamaterialet oppbevares på en personlig datamaskin. Tilgangen til datamaskinen er med passord.

Hva skjer med opplysningene dine når vi avslutter forskingsprosjektet?

Opplysningene blir anonymisert/slettet når prosjektet avsluttes/oppgåven er godkjent, noe som etter planen er mai 2023.

Hva gir oss rett til å behandle personopplysninger om deg?

Studien behandler opplysninger om deg basert på ditt samtykke.

På oppdrag fra Høgskulen på Vestlandet vil NSD, Norsk senter for forskningsdata, vurdere at behandlingen av personopplysninger i dette prosjektet er i samsvar med personvernregelverket.

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 vite mer om eller benytte deg av dine rettigheter, ta kontakt med følgende personer:

Masterstudentar:

Ane Bjørk

anebjork@live.no / 579665@stud.hvl.no

Hanna Hestetun

Hannahest1@hotmail.com / 580076@stud.hvl.no

Personvernombod ved Høgskulen på Vestlandet:

Trine Anikken Larsen

tlf. 55587682

personvernombud@hvl.no

Med vennlig helsing

Prosjektansvarlig

Parmita Saha

(Veileder)



[Meldeskjema](#) / [Bærekraftig innovasjon i industrien](#) / Vurdering

Vurdering av behandling av personopplysninger

Referansenummer

611851

Vurderingstype

Standard

Dato

29.03.2023

Prosjektittel

Bærekraftig innovasjon i industrien

Behandlingsansvarlig institusjon

Høgskulen på Vestlandet / Fakultet for økonomi og samfunnsvitenskap / Institutt for økonomi og administrasjon

Prosjektansvarlig

Parmita Saha

Student

Ane Bjørk

Prosjektperiode

13.01.2023 - 22.05.2023

Kategorier personopplysninger

Alminnelige

Lovlig grunnlag

Samtykke (Personvernforordningen art. 6 nr. 1 bokstav a)

Behandlingen av personopplysningene er lovlig så fremt den gjennomføres som oppgitt i meldeskjemaet. Det lovlige grunnlaget gjelder til 22.05.2023.

[Meldeskjema](#)

Kommentar

OM VURDERINGEN

Sikt har en avtale med institusjonen du forsker eller studerer ved. Denne avtalen innebærer at vi skal gi deg råd slik at behandlingen av personopplysninger i prosjektet ditt er lovlig etter personvernregelverket.

FØLG DIN INSTITUSJONS RETNINGSLINJER

Vi har vurdert at du har lovlig grunnlag til å behandle personopplysningene, men husk at det er institusjonen du er ansatt/student ved som avgjør hvilke databehandlere du kan bruke og hvordan du må lagre og sikre data i ditt prosjekt. Husk å bruke leverandører som din institusjon har avtale med (f.eks. ved skylagring, nettspørreskjema, videosamtale el.)

Personverntjenester legger til grunn at behandlingen oppfyller kravene i personvernforordningen om riktighet (art. 5.1 d), integritet og konfidensialitet (art. 5.1. f) og sikkerhet (art. 32).

MELD VESENTLIGE ENDRINGER

Dersom det skjer vesentlige endringer i behandlingen av personopplysninger, kan det være nødvendig å melde dette til oss ved å oppdatere meldeskjemaet. Se våre nettsider om hvilke endringer du må melde: <https://sikt.no/melde-endringer-i-meldeskjema>

OPPFØLGING AV PROSJEKTET

Interview guide

Information

As part of our Master's program in economics and administration (named Master of Science in Business) at Høgskulen på Vestlandet in Sogndal, we are conducting a research study for our master's thesis. Our aim is to gain a better understanding of the relationship between businesses' sustainable innovation practices from an external relations perspective and its triple bottom line outcome. To achieve this goal, we would like to request an interview with you to learn more about how your company/organization approaches sustainable innovation. Please note that all information you provide will be kept confidential, will only be used for research purposes and your identity will be kept anonymous in our report.

Introduction

1. What is the respondent's position?
 - a. Where do you work?
 - b. What are your responsibilities in this organization?

Main section

Questions about sustainable innovation

2. Questions for industrial companies
 - a. Are you familiar with the term sustainable innovation?
 - b. What do you associate with sustainable innovation?
 - c. What relation does the company have to sustainable innovation?
 - d. How does the company work with sustainable innovation?
 - i. How does the company implement processes in order to achieve sustainable innovation?
 - ii. How does the company implement policies in order to achieve sustainable innovation?

- e. Why do you think it is important for your company to focus on sustainable innovation?
- f. What influences the company to work with sustainable innovation?
 - i. Do external stakeholders influence the company to work with sustainable innovation? If so, which one and why (authorities, customers, suppliers, local communities, etc.)?
 - ii. How does the company relate to these different stakeholders? Is there someone who has a greater power of influence than others? If so, elaborate on this.
- g. How does the company experience requirements relate to sustainable innovation from stakeholders?
- h. What advantages does the company gain from engaging in sustainable innovation activities?
- i. What makes the company decide to invest in sustainable innovation?
- j. How does the sustainable innovation implementation process affect the environmental, social and economic outcomes or improvements (TBL)?
 - i. Does the company succeed in meeting all the requirements in terms of the environment, social, and economic?
- k. (Statement) Can you elaborate on this? / how do you explain this?
 - i. (Use statements adapted to each individual company).

3. Questions for experts

- a. What do you associate with sustainable innovation? What is your relationship to the concept of sustainable innovation?
- b. What is your relationship to the concept of sustainable innovation?
- c. How do you feel that Norwegian industrial companies work with sustainable innovation?
 - i. How do you feel that companies implement processes to achieve sustainable innovation?
 - ii. How do you feel that companies implement guidelines to achieve sustainable innovation?
- d. What do you feel influences industrial companies to work with sustainable innovation?

- i. Which external stakeholders influence the companies to work with sustainable innovation?
- e. What advantages do you see in implementing sustainable innovation practices in industrial companies?
- f. How do you feel the companies are handling the triple bottom line (TBL) in terms of sustainable innovation?

Closing

- 4. Would you like to add something?
- 5. Do you have any advice for potential interviewees we should talk to?

Thank you very much for your time! We really appreciate your help.

Intervjuguide

(oversatt til norsk)

Informasjon

Vi tar en Master i økonomi og administrasjon (med navn Master of Science in Business) på Høgskulen på Vestlandet i Sogndal. I denne forbindelse ønsker vi gjerne å intervju deg til vår masteroppgave. Vi søker å få en bedre forståelse av forholdet mellom bedrifters bærekraftige innovasjonspraksis fra et eksterne relasjonsperspektiv og dets tredelte bunnlinje resultat. Vi ønsker derfor å få informasjon fra deg om hvordan deres selskap/organisasjon forholder seg til bærekraftig innovasjon. Denne informasjonen vil bli behandlet konfidensielt, og du vil bli anonymisert i vår rapport.

Innledning

1. Respondentens arbeidsforhold?
 - a. Hvor jobber du?
 - b. Hva er ditt ansvar i denne organisasjonen?

Hoveddel

Spørsmål om bærekraftig innovasjon

2. Spørsmål til industribedrifter
 - a. Kjenner du/dere til begrepet “bærekraftig innovasjon”?
 - b. Hva forbinder du med bærekraftig innovasjon?
 - c. Hva forhold har bedriften til bærekraftig innovasjon?
 - d. Hvordan jobber bedriften med bærekraftig innovasjon?
 - i. Hvordan implementerer selskapet prosesser for å oppnå bærekraftig innovasjon?
 - ii. Hvordan implementerer selskapet retningslinjer for å oppnå bærekraftig innovasjon?

- e. Hvorfor tror du det er viktig for din bedrift å fokusere på bærekraftig innovasjon?
- f. Hva påvirker selskapet til å jobbe med bærekraftig innovasjon?
 - i. I hvilken grad påvirker eksterne interessenter dere til å jobbe med bærekraftig innovasjon? Og hvilke eksterne interessenter og hvordan oppleves påvirkningen (Myndigheter, kunder, leverandører, lokalsamfunn osv.)?
 - ii. Hvordan forholder selskapet seg til disse ulike interessentene? Er det noen som har en større påvirkningskraft enn andre? Isåfall, utdyp dette.
- g. Hvordan opplever selskapet krav knyttet til bærekraftig innovasjon fra interessenter?
- h. Hvilken fordeler opplever selskapet med å gjennomføre aktiviteter for bærekraftig innovasjon?
- i. Hva er grunnen til at dere velger å satse på bærekraftig innovasjon?
- j. Hvordan påvirker implementeringsprosessen for bærekraftig innovasjon de miljømessige, sosiale og økonomiske resultatene eller forbedringene (TBL)?
 - i. Lykkes bedriften med å oppfylle alle kravene når det gjelder miljø, sosialt og økonomisk?
- k. Utsagn - Kan du utdype/forklare dette?
 - i. *(Bruke utsagn tilpasset hver enkelt bedrift).*

3. Spørsmål til eksperter

- a. Kjenner dere til begrepet bærekraftig innovasjon? Hva forbinder du med bærekraftig innovasjon?
- b. Hvilket forhold har dere til begrepet bærekraftig innovasjon?
- c. Hvordan opplever dere at norske industribedrifter jobber med bærekraftig innovasjon?
 - i. Hvordan opplever dere at selskaper implementerer prosesser for å oppnå bærekraftig innovasjon?
 - ii. Hvordan opplever dere at selskaper implementerer retningslinjer for å oppnå bærekraftig innovasjon?
- d. Hvilken fordeler ser dere ved å innføre aktiviteter for bærekraftig innovasjon i industribedrifter?

- e. Hva opplever dere påvirker industribedrifter til å jobbe med bærekraftig innovasjon?
 - i. Hvilke eksterne interessenter påvirker bedriftene til å jobbe med bærekraftig innovasjon?
- f. Hvordan føler du at selskapene håndterer den tredelte bunmlinjen (TBL) når det gjelder bærekraftig innovasjon?

Avslutning

- 4. Ønsker du å legge til noe?
- 5. Har du tips til andre personer vi kan intervju?

Tusen takk for tiden din! Vi setter stor pris på din hjelp.