



The Role of Sustainability Indicators and their Impact on Decision-making and Control

A Case Study of Mestergruppen

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Abstract

The climate crisis is happening much faster than anticipated and the construction industry has a big responsibility to become more sustainable since it stands for more than 15% of Norway's total emissions. While the direct emissions from the industry are relatively small, the indirect emissions are significant. Based on this, organizations in this industry need to act. Sustainability indicators can be used to monitor goals and measure sustainability performance. The research on sustainability indicators is growing but there are still shortcomings, especially regarding comparison of sustainability indicators, which indicators that are most useful and what the contribution of sustainability indicators is. The research question we aim to answer in our study is therefore: *What is the role of sustainability indicators and how do they impact decision-making and control in an organization?*

To answer this question, we have conducted a single case study of Mestergruppen to gain in-depth data. The data were gathered through four semi-structured interviews, Mestergruppen's website and relevant documents. To analyze the data, we developed a conceptual framework based on literature and theories regarding sustainability, stakeholders, and Management Control System in an attempt to contribute with new insights. Based on the findings we have identified six challenges and explore in this study how a development of sustainability indicators can help Mestergruppen to solve these to become more sustainable. The challenges are as follows: Mestergruppen does not have sustainability indicators today, the values lack a presence in the organization, sustainability decisions are taken by a smaller group of managers, the ethical guidelines do not focus on the environmental dimension, the supply chain is difficult to control since Mestergruppen does not own all its suppliers and the SDGs are used to a small degree in the development of plans and sustainability goals.

Based on the theory and findings, we find it necessary for Mestergruppen to develop sustainability indicators if it wants to become more sustainable. The findings show that sustainability indicators can have several roles depending on which sustainability challenge to solve. They can for instance have a supportive, informative, monitoring, and guiding role. Based on this, we find that sustainability indicators can have a positive impact on both decision-making and control.

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1. Introduction

1.1 Background

The climate crisis of our time is happening much faster than one could anticipate, but as the UN Secretary-General, António Guterres, mentioned in September 2019: “the climate emergency is a race we are losing, but it is a race we can win” (United Nations, n.d.a). Two years later Guterres warns that the world is heading for a 2,7 degrees temperature increase if there is no reduction in the climate emissions (NTB, 2021). In addition, on the “SDG moment 2021” Guterres pointed out that “our world is challenged like never before. From climate change to conflicts to COVID-19, which is putting the Sustainable Development Goals further out of reach” (United Nations, 2021d, 0:48). Regarding the situation today, a new report from United Nations in 2021 shows that the goals set out in the Paris agreement will not be achieved (NTB, 2021).

The Paris Agreement is an international treaty which entered into force in 2016 (United Nations, n.d.b). Today, including the European Union, 191 parties have joined the agreement, committing themselves to reduce their emissions and work jointly to adapt the different impacts from the climate change. The parties are through this agreement provided with a framework that guides their work in multiple years to come. The implementation of the Paris Agreement and the shift towards a net-zero emission world are important parts of achieving the Sustainable Development Goals (hereafter SDGs) in the future. One of the long-term goals of the agreement involves reducing greenhouse gas emissions to limit the global temperature increase to 2 degrees Celsius, and at the same time pursuing to limit it further down to 1,5 degrees, before the end of the century. As the world is heading for a 2,7 degrees temperature increase, the future prospects for the climate and globe seems bad (NTB, 2021).

In order to reach the SDGs for 2030, it is necessary that businesses and societies invest in sustainable projects (European Commission, n.d). Furthermore, there is an increasing demand from different stakeholders regarding sustainability, regulations as for instance the EU-taxonomy set expectations for businesses and communities to make more sustainable choices, investors are more focused on Environmental, Social and Governance (ESG) investments than before, and consumers want to use sustainable products and services (European Commission, n.d; FN Sambandet, 2020; Unruh, et al., 2016; Hanss & Böhm, 2012). In a business context, the concept of sustainability involves doing business without impacting the environment,

society, or community negatively, and to succeed, organizations need to have a good balance between making a profit and taking considerations regarding the environment and society (Spiliakos, 2018). The UN Global Compact is the world's largest initiative for corporate sustainability (UN Global Compact, n.d.c). It is a voluntary initiative where CEO's commit their organizations to implement universal sustainability principles and to take some important steps to support the SDGs (UN Global Compact, n.d.a).

The construction industry plays an important part in the society and has therefore a responsibility to be aware of their emissions and actions to become more sustainable (Asplan Viak, 2019). For Norway to reach its climate goals, the construction industry needs to change because it has a major impact on both direct and indirect emissions (Bygg21, 2018). Overall, this industry has relatively small direct emissions but has a big indirect effect on emissions through the industrial, transport, energy, and waste sector. In 2010 the production of buildings stood for 19% of the total climate emissions on a global basis (Asplan Viak, 2019). Furthermore, the construction industry was responsible for 15,3% of Norway's total emissions in 2017, where the main contribution was from other sectors. In relation to the industry's direct and indirect emissions, the building sector has started to take responsibility to reduce and report these emissions (Bygg21, 2018). Organizations can act and show a responsibility by for instance certifying their buildings with BREEAM, becoming "Miljøfyrtårn" certified, or by using environmental product declarations (hereafter EPDs) (Bygg21, 2018; Miljøfyrtårn, n.d; EPD-Norge, n.d). By setting requirements for low-emission materials, the construction industry can reduce their indirect emissions, which can have a huge effect on total emissions since the industry stands for 40-50 percent of the material usage in the society on a global level (Bygg21, 2018).

Management Control Systems (hereafter MCS) can be used to support the sustainability goals of an organization (Gond et al., 2012; Jørgensen & Pedersen, 2018, p. 155). Furthermore, these systems can shape the practices of different players of the organization, and they are therefore, if used appropriately, a good tool to push the organization in a more sustainable direction (Gond et al., 2012). The MCS includes, among other things, Key Performance Indicators (hereafter KPIs) which can be good tools for managers to use to monitor goals and measure performance (Simons, 1995a). In order to succeed with becoming more sustainable, an organization can develop different sustainability KPIs that can help managers to get an overview of the organization's sustainability performance. Even though traditional MCS can contribute positively, they are seen as limited in considering stakeholders' interests, other than

the ones of the shareholders, and limited in dealing with environmental and social challenges (Gond et al., 2012). Stakeholder Theory and the theory of Sustainability Supply Chain Management (hereafter SSCM) can therefore be good theoretical supplements when looking at sustainability challenges, and how organizations can become more responsible and involve more stakeholders, for instance the suppliers, in their development of sustainability indicators (Freeman et al., 2007; de Haan-Hoek et al., 2020).

1.2 Purpose, research question and contribution

The research about corporate sustainability is growing, but there is still a long way to go for organizations to become sustainable and the research-based insights about sustainability are still lacking (Jørgensen & Pedersen, 2018, p. 4). The world is getting more global and information technology leads to more focus on transparency, openness, and responsibility (Freeman et al., 2010, p. 5). This has led to an increased interest for new ways of thinking about business by understanding the effects of capitalism, ethics, sustainability, and social responsibility. To succeed with becoming sustainable, the whole organization needs to be designed in a way where everyone is working towards the same goals and direction, which involves for instance an organization's values, measurements and indicators, incentives, and structures (Jørgensen & Pedersen, 2018, pp. 49-54).

On the event “NTNU x TERRAVERA Mobilisering” on the 1st of September 2021, the main discussion subject was the development, design, and use of sustainability indicators (TERRAVERA, 2021). Here it was pointed out that there is still a lack of research on comparison between sustainability indicators and which indicators that are relevant and useful (TERRAVERA, 2021, 20:00-26:45). In addition, there are problems with what the contribution of sustainability indicators is since organizations measure their performance differently (TERRAVERA, 2021, 25:00). It is therefore challenging to understand which organizations that have the best sustainability performance and how they should act to make better decisions and achieve more control. For instance, in the construction industry sustainability indicators can give an organization better information about which material choices to make (see Appendix 4).

Since the construction industry is responsible for a significant part of Norway's total emissions, it is interesting to study how organizations in this industry can use sustainability indicators to reach their sustainability goals. By using Simons' (1995a) Levers of Control

(hereafter LoC) framework, Stakeholder Theory, and the theory of SSCM we will try to examine the role and impact of sustainability indicators further. Simons' (1995a) framework has been used frequently in previous literature to study the MCS and is therefore suited to use in this study to look at the role of sustainability indicators and how these work as an integrated part of the MCS. Stakeholder Theory is about creating value for the stakeholders of the organization and is suited for our research because it can be used to understand the relationship between the different groups that have an interest in the organization in relation to sustainability indicators' impact (Freeman et al., 2007, 48). The theory of SSCM looks at how supply chain sustainability is integrated in the LoC framework, and this theory is a suitable compliment to the LoC framework and Stakeholder Theory because it gives an even more detailed picture of one specific stakeholder group, the suppliers (de Haan-Hoek et al., 2020).

The purpose of this study is to investigate the role and impact of sustainability indicators in an organizational and industrial setting. In addition, the study will contribute with a development of sustainability indicators for the case-company and TERRAVERA. Based on existing literature and the lack of further relevant research, this study will try to answer the following research question:

What is the role of sustainability indicators and how do they impact decision-making and control in an organization?

Sustainability indicators are viewed as a management tool that organizations can use to become more sustainable (Searcy, 2009). It can be necessary to define the indicators' role when using them, and this role will vary depending on the area of application. We have limited our research to the areas decision-making and control and will investigate how the indicators can impact these areas based on the different roles the indicators can have.

When answering the research question, we will look at the management of Mestergruppen which is a housing and construction product group (Mestergruppen, n.d.a). In relation to this, we will look at a use-case from the organization to further concretize the study and this is also in collaboration with TERRAVERA. The use-case is a garage-configurator that aims to calculate total emissions from a standard garage in addition to calculating the associated price. The idea of this use-case is to make both Mestergruppen and the end user more aware of their decisions by using sustainability indicators as a tool. In relation to this use-case, we have developed sustainability indicators that look at the building material concrete and how

different types of concrete (Industry Standard vs. Low Carbon) will have different emissions, amount of waste, and lifetime. By doing calculations based on different EPDs, the indicators show that Low Carbon concrete emits less than the Industry Standard. These findings can contribute with valuable insights for Mestergruppen and based on this the employees can make better decisions and gain more control of the organization's overall environmental performance. In Appendix 4 more details about this practical work is presented, including a QR-code for a landing page on TERRAVERA's website that shows all the sustainability indicators developed, and our calculations made in Excel.

As we investigate the research question in this study, we wish to contribute with interesting and useful insights on the area of sustainability indicators. Our contribution involves expanding the area of literature on sustainability indicators and how an organization can proceed when designing and using them, which is requested as further research by Searcy (2009). Our research aims to look at the role and impact of sustainability indicators in an organization regardless of the number of sustainability indicators it has already developed. This case study can give better insights and improve the understanding of sustainability indicators' role and impact on sustainability decisions and control in an organization. A problem pointed out by TERRAVERA (2021, 25:00) is the lack of standardized sustainability indicators that have a well-functioning design. The study can also give insights about which trade-offs must be taken in decision-making to become more sustainable while at the same time sustaining profitable, which is mentioned as an area of future research by Jørgensen and Pedersen (2018, p. 4). In addition, this study can draw some important lines between management and sustainability and show how an organization can manage it in the right direction with different indicators (Gond et al., 2012). The study also seeks to give some important insights about the stakeholders in relation to sustainability, goals, and plans, and how suppliers in the supply chain can be monitored through sustainability indicators (Garvare & Johansson, 2010; de Haan-Hoek et al., 2020).

1.3 Research method

To answer the research question, a qualitative research method was used. The study is a single case study of Mestergruppen, and the purpose is to explore how sustainability indicators impact decision-making and control based on the multiple roles they can have. To answer this, a theoretical foundation will be presented before the collection of the data will be displayed.

The data was collected through four semi-structured interviews with employees from different positions in Mestergruppen. The theory and data collected create the foundation for a further analysis that aims to answer the research question of the study.

1.4 Outline

The research question will be investigated and answered through the seven chapters of this study. In Chapter 2 the literature and theoretical foundation for the study will be introduced. Furthermore, Chapter 3 presents the research methodology used in this study. The empirical background of Mestergruppen will be described in Chapter 4, before the empirical findings are presented in Chapter 5. The analysis and discussion of the findings will be presented in Chapter 6. In Chapter 7 the conclusion and recommendations for future research are given.

2. Literature

This chapter will address the literature and the theoretical basis for this study. First, in section 2.1 the literature of sustainability will be elaborated. In section 2.2 literature about MCS, more specifically Simons LoC framework, will be explained. Furthermore, in section 2.3 the Stakeholder Theory will be presented. In section 2.4, an integration of the LoC framework and supply chain sustainability is introduced. Finally, in section 2.5 a summary of the literature is viewed through a developed conceptual framework.

2.1 Sustainability

In this section the literature of sustainability will be introduced. In section 2.1.1 and 2.1.2 the concept of sustainable development and corporate sustainability will be explained respectively. In section 2.1.3 existing literature on sustainability indicators will be presented.

2.1.1 The concept of sustainable development

As the awareness and the number of terms for sustainability continues to increase, the terminology of sustainable development is becoming more important (Glavič & Lukman, 2007). Sustainability can be seen as a goal or an endpoint of a process that is called “sustainable development” (Diesendorf, 2000). Sustainable development can be described as a process or evolution (Glavič & Lukman, 2007). More specifically, the concept of sustainable development emphasizes the evolution of the human society in line with the processes of the environment and nature. There are many definitions of the concept of sustainable development, and many of them are similar to the one given by the Brundtland Commission.

In 1987 the World Commission on Environment and Development were asked to formulate “a global agenda for change” (World Commission on Environment and Development, 1987, p. 1). In the report “Our Common Future”, the commission defines sustainable development as “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, p. 36). This definition has been used extensively in retrospect.

For the world become more sustainable, the SDGs were developed by the UN and several countries (United Nations, n.d.c). There are in total seventeen SDGs and these are all together

a part of the UN's plan of creating a better future for everyone (UN Global Compact, n.d.b). For instance, the fifth and thirteen SDG involve gender equality and climate action respectively (United Nations, n.d.c). The agenda for the year 2030 involves these seventeen SDGs, and the goals illustrate the world we all want to achieve for the future, where all nations and humans are included (UN Global Compact, n.d.b).

2.1.2 The concept of corporate sustainability

The concept of sustainable development can be applied to a business level. Corporate sustainability can be defined as “[...] meeting the needs of a firm's direct and indirect stakeholders (such as shareholders, employees, clients, pressure groups, communities etc), without compromising its ability to meet the needs of future stakeholders as well” (Dyllick & Hockerts, 2002, p. 131). Another definition states that it is “[...] the ability to conduct business with a long-term goal of maintaining the well-being of the economy, environment and society” (Hassini et al., 2012, p. 70).

The concept of corporate sustainability includes three dimensions: economic, natural, and social sustainability (Dyllick & Hockerts, 2002). Firms that seek to achieve the goal of corporate sustainability must, among other things, maintain and grow the capital base of all these three dimensions. For a business to achieve a three-dimensional bottom line and be pulled in the right direction, the organization needs to develop a design that makes it able to be profitable and sustainable at the same time (Jørgensen & Pedersen, 2018, p. 153). This involves a requirement of making the right objectives for the three dimensions, measuring, and monitoring relevant elements, and communicating them to the people that seek this information. Rewarding parties that help the organization to become more sustainable is also a requirement of developing such a three-dimensional organizational design.

A narrow view of corporate sustainability with a focus only on the economic aspect can create a short-term success of sustainability, but in the long run corporate sustainability requires that all these dimensions are satisfied simultaneously (Dyllick & Hockerts, 2002). This means that to achieve long-term corporate sustainability, organizations must manage their natural and social capital in addition to their economic. In addition, these dimensions can influence each other in different ways since they are interrelated. Since the three dimensions are key elements of corporate sustainability one can integrate them into a “Triple Bottom Line”.

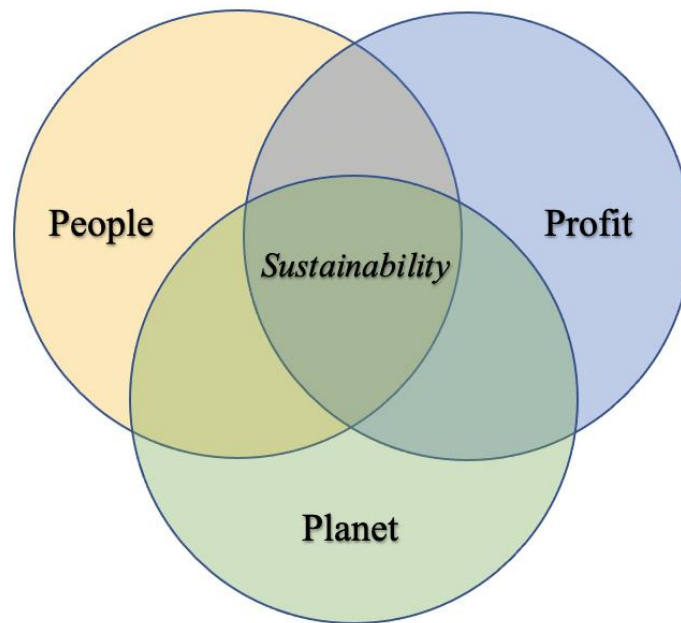


Figure 1 - Triple Bottom Line (Sustainability Illustrated, 2014, 0:52, as cited in University of Wisconsin, n.d)

Triple Bottom Line (hereafter TBL) is a transformation framework for organizations that need guidance in moving towards a more sustainable focus and includes different tools that can help them develop sustainable systems and models (University of Wisconsin, n.d). In 1994 John Elkington developed the concept of TBL, hoping to change the existing business system focus on financial accounting towards a more holistic focus (University of Wisconsin, n.d). Elkington wanted organizations to prepare for three different bottom lines, and these can also be referred to as the three “Ps”: “Profit”, “People” and “Planet” (The Economist, 2009).

TBL is illustrated in figure 1 with three overlapping circles representing the three Ps. The overlapping area of “Profit”, “People” and “Planet” can be defined as sustainability (Sustainability Illustrated, 2014, 0:52, as cited in University of Wisconsin, n.d). As the pioneer of TBL, Elkington explains that “Sustainable development involves the simultaneous pursuit of economic prosperity, environmental quality, and social equity. Companies aiming for sustainability need to perform not against a single, financial bottom line but against the triple bottom line” (Elkington, 1998, as cited in Casey et al., 2014). Organizations need to measure the financial, social, and environmental performance over a period, and according to TBL theory if an organization only focuses on profits, it will not consider all costs of doing business (Kenton, 2021).

In the research done by Formentini and Taticchi (2016), they defined corporate sustainability in relation to TBL. The researchers pointed out that when defining corporate sustainability and considering all the dimensions of TBL simultaneously, a re-thinking of how to design and conduct business on both a company and supply chain level is required. Regarding re-thinking the supply chain, SSCM was mentioned, and this perspective is currently gaining more attention. In general, SCM is defined by Hassini et al. (2012, p. 70) as “[...] the control of the supply chain operations, resources, information and funds in order to maximize the supply chain profitability or surplus [...]”. Furthermore, Ahi and Searcy (2013) informed that SSCM can be described by seven characteristics (a focus on aspects such as economic, environmental, social, stakeholder, volunteer, resilience and long-term), and based on these, SSCM can be defined as:

The creation of coordinated supply chains through the voluntary integration of economic, environmental, and social considerations with key inter-organizational business systems designed to efficiently and effectively manage the material, information, and capital flows associated with the procurement, production, and distribution of products or services in order to meet stakeholder requirements and improve the profitability, competitiveness, and resilience of the organization over the short- and long-term. (Ahi & Searcy, 2013, p. 339).

2.1.3 Sustainability indicators

In general, indicators can be defined as quantitative information that can explain changes between subjects or changes over time (Briguglio, 2003). The main function of indicators is to support decision-making, communicate information, establishing standards and setting targets, focus discussions and monitor developments. Indicators can further transfer into the term KPIs (Key Performance Indicators) which “[...] are a few strategically important metrics that often represent a balanced set of aspects such as productivity, utilization, or performance in general” (Liebetruth, 2017, p. 541). When developing KPIs, it is normal to start with an assessment of the key areas of impact for an organization and thereafter identify where these areas intersect with the areas of responsibility (Park et al., n.d). Basic sustainability KPIs are often measures of critical resources and costs, for example greenhouse gas emissions and usage of raw materials.

Today, more organizations are making sustainability reports since the sustainability focus is growing and is becoming more important to organizations, customers, shareholders, and the government (Park et al., n.d). Some countries are currently reporting on non-financial performance because it is already a requirement for them. According to Park et al. (n.d) there are today four different motivating factors for developing sustainability KPIs. These factors are as follows: stakeholder demands, shareholder expectations, evolving regulations, and performance evaluation of sustainability and corporate citizenship efforts. The first two factors involve the customers' increased focus on sustainability performance of companies, and the shareholders that are actively interested in information about the social and environmental performance of a company when making investments. The third factor includes an expectation of more requirements for reporting on carbon and mandatory reporting of the social and environmental dimension in the future. The fourth and last factor considers the development of well-functioning sustainability KPIs because it is important to design and evaluate an organization's sustainability strategy and measure its performance up against different targets.

There is a growing focus on sustainability challenges which drive organizations toward integrating the financial, social, and environmental dimension into their overall strategy (Hristov & Chirico, 2019). The work of integrating sustainability and strategy is also growing, and multiple studies have looked at the usefulness of sustainability KPIs for organizations. The use of sustainability indicators can help organizations to become more sustainable, but to succeed it is necessary to have indicators that have an actual context for being developed, and the employees that are using the indicators must understand this context (Mickwitz & Melanen, 2009). A sustainable strategy can create positive effects on the performance of an organization, for instance by creating positive effects on the reputation and cost reductions due to more efficiency in the resource usage (Hristov & Chirico, 2019). It can also help organizations to become more aware and help them to identify customers' preferences of environmental aspects which further can turn into a competitive advantage. In addition, better awareness of the environment can increase employee productivity, which can lead to more efficiency and sales. When creating indicators, it can be useful to think about the different levels of the supply chain when managing, and this includes the policy, strategy, and operational level (Searcy, 2009). The development of sustainability indicators may vary in difficulty depending on the supply chain. Factors that may have an impact on the difficulty of developing indicators are the strength of the relationships with the suppliers, the supply network's diffuseness, and the vulnerability of reputation for suppliers.

On the “NTNU x TERRAVERA Mobilisering” event, sustainability indicators were the main topic of the discussion (TERRAVERA, 2021). Among other things, important topics of the discussion were the urge for developing shared standards that organizations can use to measure their performance, reward good performance and compare their performance with other organizations. Regarding sustainability indicators in the future, Siri Kalvig stated that “[...] we need to start calculating and modeling it properly” (TERRAVERA, 2021, 26:37). As a final remark of the event, Martin Skancke pointed out that:

We know we have much data on sustainability, but we are not able to turn everything into information and insight. We also know a lot about many simple topics about sustainability, but we are unable to see relationships and the entirety. (TERRAVERA, 2021, 1:06:04).

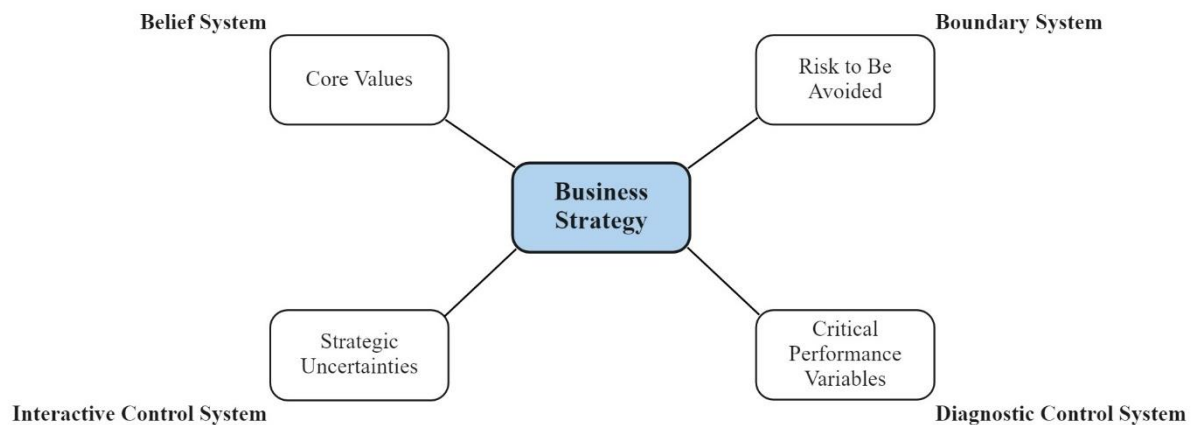
In addition, Skancke stated that “Better and more complete information is a prerequisite for better decisions” (TERRAVERA, 2021, 1:08:08). He also highlighted the importance of easily accessible, standardized, and comparable sustainability information, and said that “[...] this is an enormous challenge because we are in a fragmented landscape where there is a lack of good, reliable and comparable information” (TERRAVERA, 2021, 1:10:02).

2.2 Management Control Systems

Simons’ (1995a) Levers of Control (LoC) framework is the theoretical framework that will be used in the discussion of Management Control Systems (MCSs). In section 2.2.1 the framework will be presented, describing the four levers, before we look at the balance of the levers in section 2.2.2 and why this is important. Lastly, in section 2.2.3, we will look at critique of the LoC framework.

2.2.1 Simons’ Levers of Control framework

Simons’ (1995a) LoC framework is a tool that can be used to implement and control the business strategies and is developed over several years based on different field studies (Ferreira & Otley, 2009; Martyn et al., 2016). Simon’s study, conducted in 1987, looks at the relationship between accounting controls and strategy, and was the forerunner for the LoC framework (Simons, 1987). Simons (1990) follows up this study by looking at two companies in the same sector and how they use MCS differently based on what they view as strategic



The LoC framework is divided into three levels as shown in Figure 2. The role of the business strategy is the center of the framework. The business strategy shows how an organization position itself and how it competes (Martyn et al., 2016). The next level in the framework are the key strategic variables: *Core Values*, *Risk to Be Avoided*, *Strategic Uncertainties* and *Critical Performance Variables* (Simons, 1995b, p. 7). For an organization to implement its business strategy successfully these key strategic variables must be well understood by the management. The last level contains the levers. The four levers have as their purpose to manage the strategic variables and must be aligned with the strategy of the organization. (Martyn et al., 2016). The levers are divided into two opposing forces, the positive and the negative levers (Simons, 1995b, pp. 7-8). The belief system and interactive control system represents the positive side by being inspirational forces, while the boundary system and diagnostic control system represents the negative side by creating constraints and control the compliance.

often designed to be broad, so that it will interest all the different groups in the organization (Simons, 1995a). If an organization wants to succeed with the belief system, it is necessary that managers' actions are in line with the stated values and purpose for the employees to see the importance and thereby work towards the same beliefs and goals. This can be done through mission and vision statements, strategy documents, newsletters, courses, or meetings, and if one succeeds with the belief system, employees can get inspired to utilize opportunities and find new ways of creating value (Simons, 1995b, pp. 33-36).

The second lever is the boundary system. This lever has a negative focus by establishing rules and controls for what activities the employees are not allowed to do, based on defined risks for the organization (Simons, 1995a). By establishing rules, the boundary system can lead to innovation and autonomy within defined limits and enable delegation of responsibility, which again can lead to creativity and flexibility (Simons, 1995b, pp. 40-41). The boundary system can be implemented through rules and responsibility, as for instance ethical guidelines and role descriptions, strategic boundaries to clarify what is expected from each employee, and through sanctions or punishment if the employees break the rules (Simons, 1995b, pp. 52 & 178).

The third lever is the diagnostic control system. This formal information system can be used to monitor goals and measure progress towards organizational targets (Simons, 1995a). The purpose of the diagnostic control system is to focus on the critical success factors of the organization to reach its goals and to minimize the need for monitoring (Simons, 1995b, p. 59). The lever intends to motivate the employees to align their behavior and performance with the objectives of the organization (Widener, 2007). Through repeated processes and managing through deviation, the diagnostic control system can be managed. This is done by establishing predefined standards and goals that the employees can work towards (Simons, 1995b, p. 59).

The fourth and last lever is the interactive control system. This formal information system is used by managers to involve themselves regularly and more personally in the decisions of employees, and in contrast to the diagnostic control system, this lever is forward-looking (Simons, 1995b, p. 95; Widener, 2007). This control system only gets interactive if the management personally shows engagement and dedication, and to succeed with this lever there are four important characteristics to consider (Simons, 1995b, pp. 96-97). The first one is the focus on information that is strategically important. Secondly, this information demands attention and the involvement of all managers at every level of the organization. Thirdly, the

managers and employees discuss and analyze the data together, face to face, and lastly, the interactive control system is an incentive for continuous debate about the underlying data and assumptions for the decisions made in the organization.

2.2.2 Balance of the four levers

In his book from 2000, Simons (2000) emphasizes the necessity that all the four levers in the LoC framework must work together to create an effective control environment, and states that:

Control of business strategy is achieved by integrating the four levers of beliefs systems, boundary systems, diagnostic control systems, and interactive control systems. The power of these levers in implementing strategy does not lie in how each is used alone, but rather in how the forces create a dynamic tension (Simons, 2000, p. 301, as cited in Widener, 2007, p. 760).

Balance is a concept that is central in the LoC framework, but to a large extent implicit (Mundy, 2010). Widner (2007) emphasizes the importance of balance between the four levers in her article. The attention from the top management is necessary to process required information to properly manage the organizations strategic concerns, and by being able to rely on the levers, efficient use of management attention can be facilitated (Simons, 2000, as cited in Widener, 2007). In her article, Widner (2007) finds that the belief system influences and compliments the other three levers and that an interactive use of performance measures can help to explain the diagnostic use of performance measures. The two elements strategic risk and strategic uncertainties drive the role and importance on the levers. The necessity and importance of a balance between the levers in Simons' framework is also emphasized by Mundy (2010). In her article, she discusses the challenges that managers face when using MCS both to direct behavior and to empower employees, and finds that logical progression, internal consistency, historical tendency and suppression, all impact how organizations balance different uses of MCS. Logical progression looks at if the levers are used in a logical order. Internal consistency examines the employees to check if they have received a clear message about priorities and goals. Historical tendency revolves around the control systems and if some are more dominant than others, and lastly, suppression looks at whether one or more control systems are suppressed by others.

2.2.3 Critique of the LoC framework

Ferreira and Otley (2009) discuss several weaknesses of the LoC framework in their research. One critique is that the framework does not focus enough on socio-ideological controls (Collier, 2005). Kärreman and Alvesson (2004) define socio-ideological controls as the attempt to control the beliefs of the employees. Another weakness is that the main focus of the LoC framework is the top-level management and therefore it does not give enough attention to the range of informal controls that exists in an organization (Ferreira, 2002, as cited in Ferreira & Otley, 2009). Informal control processes are defined by Collier (2005, p. 324) as “[...] group norms, socialization and culture”. The operation of controls at lower levels in an organization are particularly lacking focus in the framework (Ferreira & Otley, 2009). The LoC framework might therefore not adequately explain the control system and its operations as a whole, and when informal controls are especially important, this problem becomes more critical.

Malmi and Brown (2008) also point to Simons’ (1995b) definition of MCS and how this limits the use of MCS only to managers by stating that “MCSs are the formal, information-based routines and procedures managers use to maintain or alter patterns in organizational activities” (Simons, 1995b, p. 5, as cited in Malmi & Brown, 2008).

The framework also receives critique for having diffuse meanings of the key strategic variables, for example core values, which can lead to subjective interpretation from the employees (Ferreira, 2002, as cited in Ferreira and Otley, 2009). Ferreira (2002), as cited in Ferreira and Otley (2009), also points to limitations of the framework because control mechanisms can be part of several of the four levers. It is therefore necessary to emphasize the way in which the control mechanisms are used, because this is where the differences lie. Ferreira and Otley (2009) also criticize the interactive control system because of what they view as an ambiguity in the definition of the lever. They mean that the interactive controls are split in the two components “[...] interactive use of controls, and strategic validity controls” (Ferreira & Otley, 2009, p. 266). This, and the fact that the control mechanisms can be used in several levers can lead to confusion and subjective interpretations.

Despite criticism, Simons (1995b) LoC framework is widely used and cited (Martyn et al., 2016). It is viewed as a holistic framework that is focusing on all parts of management and therefore has the opportunity to implement strategy effectively by balancing all four levers in

a suited way (Simons, 2000, as cited in Widener, 2007). A strength of the framework is the focus on strategic issues and the implications they have for the control system (Ferreira & Otley, 2009). Another strength is the broad perspective of the control system that the framework offers by looking at organizations' range of controls and how they use them (Ferreira, 2002, as cited in Ferreira & Otley, 2009).

2.3 Stakeholder Theory

This section presents the framework of Stakeholder Theory. In section 2.3.1 the Stakeholder Theory framework is described before critique of the framework is elaborated on in section 2.3.2.

2.3.1 The Stakeholder Theory framework

According to Freeman et al. (2007, p. 48), "Stakeholders are the groups that can affect or be affected by the achievement of a business's core purpose". The basic framework of Stakeholder Theory states that as long as the business creates value and is continually satisfying the key stakeholders, it will be successful. Furthermore, Freeman et al. (2007, p. 48) inform that organizations need to be aware of potential influences from stakeholders which can be contrary to its purpose. In addition, there must be an agreement or a contract in place so the different stakeholders (customers, employees, suppliers etc.) share the value that is created from the business. Freeman et al. (2007, p. 48) explain that "managing for stakeholders" approach will make it easier to create value for the stakeholders simultaneously. Also, Freeman et al. (2007, p. 49) explain that if a company seeks to become sustainable, it is necessary that all the stakeholder relationships push in the same direction. In relation to this, resolving conflicts and preserving relationships is mentioned as important elements (Freeman et al., 2007, p. 50). "One size fit all" is stated as a point of view that do not work when managing the stakeholders since they are viewed as complex beings.

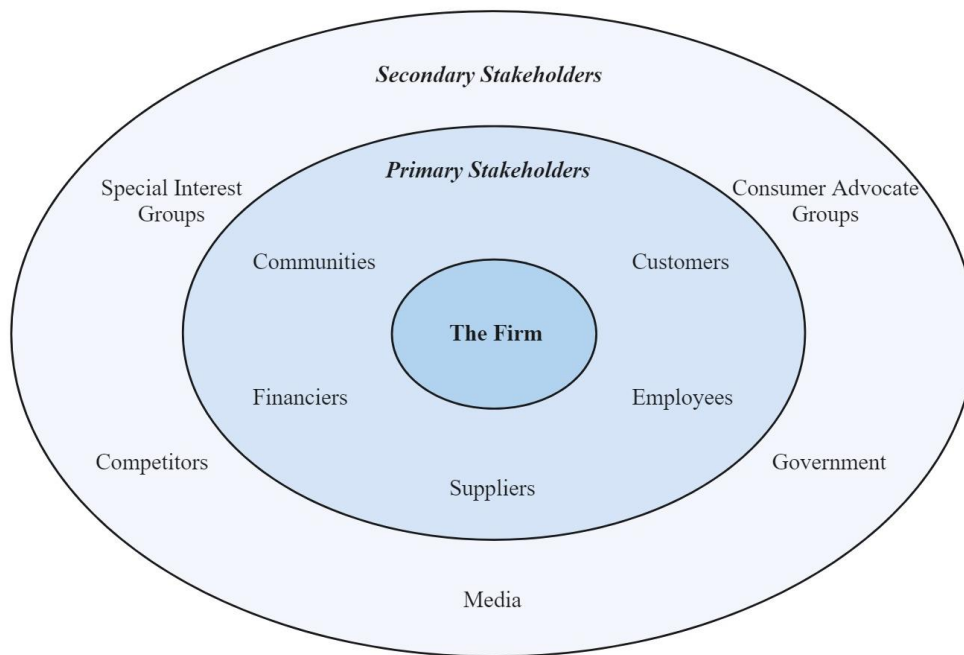


Figure 3 - Stakeholder map - primary and secondary stakeholders (Freeman et al., 2007, p. 51)

Freeman et al. (2007, p. 50) introduce two types of stakeholders: *primary* and *secondary stakeholders* (Figure 3). Primary stakeholders include groups of stakeholders that are vital for the business' growth and survival, and if the support of any of these groups are taken away the business will not be sustainable. The inner circle, in Figure 3 represents the primary stakeholders which are customers, employees, suppliers, financiers, and communities. Secondary stakeholders include groups of stakeholders that can impact the primary relationships of the organization, and here the idea is to consider the broader business environment (Freeman et al., 2007, p. 51). The outer circle, in Figure 3 represents the secondary stakeholders and these are consumer advocate groups, government, media, competitors and special interest groups.

2.3.2 Critique of the Stakeholder Theory

Despite the benefits of the Stakeholder Theory, it has also received critique throughout the years. Milton Friedman expresses one of these critiques and states that the purpose of a business is to maximize value for the shareholders (Freeman et al., 2010, p. 10). In his article from 1970, Friedman argues for reasons why the social responsibility of organizations is to increase profits with three main arguments (Friedman, 1970). His first argument is that corporations are not people, and that only people can have responsibilities. His second argument is that the money earned in the organization belongs to the owners, and it should

therefore only be used on the desired purposes of the owners. This means that the employees have no right to use this money on corporate social responsibilities if the owners do not agree. His last argument is that an employee may break laws or cause the organization taxes because he or she does not know how to spend the money correctly.

Another critique comes from Samuel F. Mansell (2013) who states that the definition of Stakeholder Theory is incomplete because it does not define any specific stakeholders. Later variants of the theory have included different stakeholders, but these may vary from variant to variant, and the theory is therefore including non-precise abstractions since every detail of the theory is not specified. Furthermore, Michael Jensen states that the Stakeholder Theory is incomplete because it cannot give an answer to these questions: “[...] how do we keep score? [...] How do we want the firms in our economy to measure better versus worse?” (Jensen, 2001, pp. 298-299). Jensen argues that managers should make every decision with the goal of increasing market value for the firm in the long-run, and that the total value is the sum of the values of every financial claim of the firm (Freeman et al., 2010, p. 12).

2.4 Integration of Supply Chain Sustainability in the LoC framework

The study by de Haan-Hoek et al. (2020) looks at the integration of supply chain sustainability in Simons (1995a) LoC framework by investigating a large, multinational organization. The expansion of the framework includes the practices of control and governance, and how the use of these in SSCM influences the performance of an organization regarding TBL.

The article finds that an alteration of the LoC concept can provide a control system that fits for the SCM (de Haan-Hoek et al., 2020). By changing the idea of “employees” as those influenced by the levers in the control system to “suppliers”, Simons (1995a) LoC framework can be used to influence the supply chain (de Haan-Hoek et al., 2020). Regarding TBL, de Haan-Hoek et al. (2020) state that the shareholders are increasingly starting to value a company’s environmental and social focus, which means that investments that benefit the “Planet” and “People” will lead to economic gains. The commitment to sustainability will not be the same for every organization, but for larger organizations, attention to the social and environmental dimension are expected. A further division of the TBL within “People”, “Profit” and “Planet” can help making these dimensions more controllable and measurable even though it might not give more information to the organization. Further in the study they

discover that the methods of control can be placed in either the diagnostic control system or the boundary system, depending on how strict and detailed a compliance rule is. It is also found that if the diagnostic control system and the belief system are properly applied, the suppliers can be given more freedom and thereby become a collaborative partner in the work of reaching the goals of the supply chain director. In relation to this, a chain director is defined as “The organization taking the lead in managing the supply chain as a whole, usually the company with most power in the supply chain, with power being derived from factors like market share and uniqueness of product or service” (Gelderman & Albronda, 2017, p. 299, as cited in de Haan-Hoek et al., 2020).

In addition, the challenge regarding supplier governance and control is identified in the study. When there are many suppliers, the interaction an organization has, across the full field of suppliers, is limited (de Haan-Hoek et al., 2020). In the article it is specified that “When it comes to ethical and sustainable sourcing, a MNC might have control over its first-tier suppliers, but what happens further upstream in the supply chain is not always clear and visible” (de Haan-Hoek et al., 2020, p. 1). An application of the levers upstream in the supply chain might lead to a collaboration between the firms, and gaps in the supply chain can be filled due to the use of several levers (de Haan-Hoek et al., 2020). The diagnostic control system can reduce the compliance and implementation gap, the belief system can reduce the gap of knowledge and information and the interactive control system can contribute to reduce the communication gap. A balanced combination of governance and control practices should therefore be used by the supply chain director, and this can be achieved by applying the different levers across the supply chain. The study also finds that the belief system can be used to implement the elements of “People” and “Planet” which are described in the article as “softer” elements of TBL, and this will further impact the boundary system and the interactive control system.

For a multinational organization to integrate sustainability, focus on the supply chain is critical since the organization inevitably is a part of a supply chain (de Haan-Hoek et al., 2020). The biggest challenge is to integrate the social and environmental dimensions into the entire supply chain, so they gain the same level of importance as the economic dimension. For organizations to be truly successful when implementing TBL in the supply chain, the application of the levers across the organizational boundaries should be done to create a “spill-over” effect on the suppliers.

2.5 Summary of the literature

Based on the literature presented in the chapters 2.1-2.4, we have developed a model to describe the impact and connections between the MCS, stakeholders, and sustainability goals. This model can be viewed as a conceptual framework used to explore the research question of this study, and according to Jabareen (2009) a conceptual framework can help to understand phenomena. We seek to investigate the role of sustainability indicators and how they impact decision-making and control in Mestergruppen.

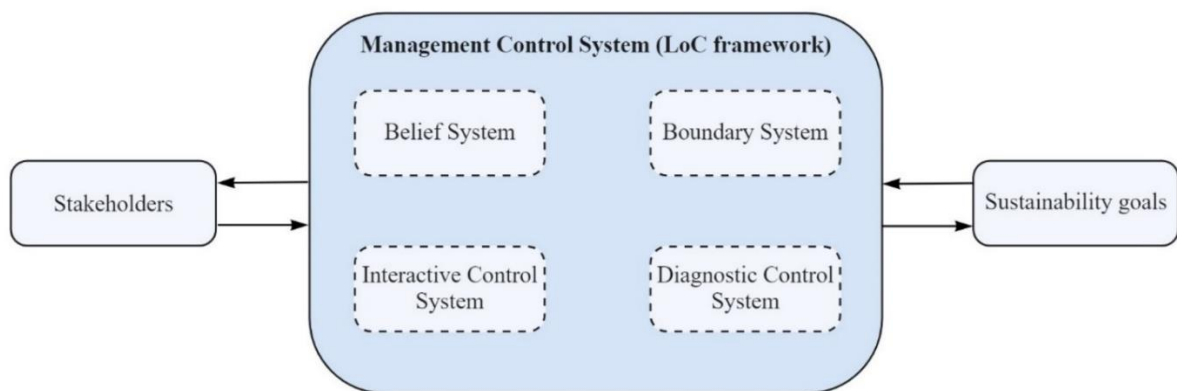


Figure 4 - Conceptual framework to explore the research question

We want to explore the impact sustainability indicators can have on decision-making and control in an organization by looking at Simons (1995a) LoC framework and the connection it has to stakeholders and sustainability implementation. We have used the study by de Haan-Hoek et al. (2020) as a basis for this developed framework, which looks at the application of control and governance through the LoC across internal and external boundaries. In the research, they find that the interaction between the four levers can help dealing with goalsetting for TBL. In addition, de Haan-Hoek et al. (2020) explain that the application of the LoC framework in a supply chain, can contribute to the pursuit of a holistic SSCM. The developed framework includes theories regarding sustainability, stakeholders and MCS in an attempt to expand the work done by de Haan-Hoek et al. (2020), and consists of the three boxes: *Stakeholder*, *Sustainability goals* and *MCS (LoC framework)*.

The *Stakeholder* box includes the Stakeholder Theory and is placed on the left side of Figure 4. All the stakeholders are included, both the primary and secondary stakeholders which are the two types of stakeholders presented in the Stakeholder Theory by Freeman et al. (2007, p. 50).

The second box is *Sustainability goals* which is situated on the right side of Figure 4. This box includes the sustainability literature of section 2.1. An example of a sustainability goal can involve achieving a TBL where all the dimensions are considered. Another sustainability goal can for instance reflect one of the seventeen SDGs developed by the UN. This box will therefore involve what an organization considers when making its sustainability goals, both in a short- and long-term perspective.

The last box is the *MCS* which is placed in the middle of Figure 4. The LoC framework presents the four levers (belief system, interactive control system, boundary system and diagnostic control system) which are all included in this box. The box reflects the management in an organization and how the four levers are balanced. Since there should be a balance between the levers according to the LoC framework, this is taken for granted in this conceptual framework as it does not include arrows within the box of MCS (Simons, 2000, p. 301, as cited in Widener, 2007, p. 760).

The relationships in the model are represented by the arrows, and by placing the *MCS* in the middle, the framework reflects how the other theoretical elements are connected to this box. Looking at the relationship between *MCS* and *Stakeholders*, there are arrows in both directions. This reflects a relationship where the stakeholders in the organization's value chain impact the MCS, and vice versa. Likewise, for the relationship between *MCS* and *Sustainability goals*, they impact each other in both directions. In addition, this model shows that the *Stakeholders* and *Sustainability goals* indirectly impact each other through the *MCS* in the organization.

3. Methodology

In this chapter we will introduce our methodological choices and explain the underlying reasons behind the choices taken to answer the research question. In section 3.1 the research design of the study will be explained. The process of data collection will be described in section 3.2, before we explain how we analyzed the data in section 3.3. The quality of the study is discussed in section 3.4 and ethical considerations of the study is presented in section 3.5. In section 3.6 the limitations of the study will be introduced, and lastly, in section 3.7 a summary of the methodological choices is shown.

3.1 Research design

This section presents the choices that are made regarding the study's research design. More specifically, the sections 3.1.1-3.1.5 will include a description of the research approach, purpose, research method, research strategy and time horizon respectively.

3.1.1 Research approach

There are three research approaches that can be chosen when developing theory, deductive on one hand, inductive on the other, and abductive somewhere in the middle (Saunders et al., 2019, p. 152). With the deductive approach the conclusion is logically obtained based on theory-obtained premises and the conclusion is true when the premises are all true. With the inductive approach, the first step is to gather data to explore a phenomenon, before building a theory or a conceptual framework based on these data. Lastly, the abductive approach is a mix of the two other approaches. With this approach the collection of data is used to explore a phenomenon, identify themes, or explain patterns to further create a new theory or modify an existing one (Saunders et al., 2019, p. 153). The abductive approach is therefore an efficient combination of deduction and induction and moves back and forth between them (Saunders et al., 2019, p. 155). Saunders et al. (2019, p. 156) points to the fact that even though there are three approaches, pure deductive or inductive studies are very difficult to achieve in reality, and that most research include some elements of the abductive approach.

The abductive approach will be used in this study to explain the role of sustainability indicators and how they impact decision-making and control (Saunders et al., 2019, p. 153). The study has elements from deduction since Simons (1995a) LoC framework, Stakeholder theory, and

theory of SSCM is used, while also having elements of induction since data is collected to explore a phenomenon and answer the research question. The goal is to use developed theory and the collected data to expand the conceptual framework presented in section 2.5 in an attempt to explain links in the findings.

3.1.2 Purpose of research design

The way in which the research question is asked will determine the purpose of the research design, and for this study, an exploratory purpose deemed most appropriate (Saunders et al., 2019, p. 186). There are four purposes for the research design: exploratory, descriptive, explanatory, and evaluative. An exploratory research purpose can help to gain insights about a topic by asking open questions and is useful to clarify understandings. Flexibility and adaptability to change gives the exploratory purpose an advantage (Saunders et al., 2019, pp. 186-187). The descriptive research has as its purpose to correctly obtain information about persons, events, or situations, and a clear picture of the phenomenon is needed before gathering data (Saunders et al., 2019, p. 187). Explanatory research is defined by Saunders et al. (2019, p. 188) as establishing casual relationships between different variables by studying a situation or a problem. Lastly, the evaluative research has the purpose of figuring out how well something works.

3.1.3 Research method

The research method used for this study is a qualitative design, and this method is normal to use when conducting a study with an inductive or abductive approach (Saunders et al., 2019, p. 179). There are three methods that can be used in research: quantitative, qualitative or mixed research (Saunders et al., 2019, p. 175). Quantitative research looks at the relationship between different variables by measuring them numerically. The data are analysed through the use of graphical and statistical techniques, and controls are often included to ensure data validity (Saunders et al., 2019, p. 178). The qualitative research examines the meanings of the participants and the relationships between these meanings by using a variation of techniques to collect data and analyse them. The goal is to contribute theoretically and develop a conceptual framework (Saunders et al., 2019, p. 179). Mixed methods is a combination of quantitative and qualitative research where the two research methods can be used in several different ways (Saunders et al., 2019, p. 182).

The qualitative study is pointed out by Saunders et al. (2019, p.179) as a research method often used when conducting an abductive study, and the qualitative research is also suitable for this study's exploratory purpose because it gives the opportunity to explore the meanings of the participants from the organization in depth.

3.1.4 Research strategy

The research strategy is a plan made to achieve a goal in addition to answering the research question (Saunders et al., 2019, p. 189). The strategy is a link between the research question and the choices made when it comes to approach, purpose and method (Saunders et al., 2019, pp. 189-190). Furthermore, the choice of research strategy depends on the timeframe of the study, existing knowledge, resources available and the access to participants and other data (Saunders et al., 2019, p. 190).

The research strategy used in this study is a single case study (Saunders et al., 2019, p. 198). A case study is suitable because in-depth insights are needed to examine the phenomenon closer and to conduct an abductive and exploratory study to answer the research question. A case study is defined by Yin (2018), as cited in Saunders et al. (2019, p. 196) as "an in-depth inquiry into a topic or phenomenon within its real-life setting". The case can be either an organization, a group, a person, or another case subject (Saunders et al., 2019, p. 196). An important aspect when conducting a case study is the choice of case and the boundaries that are set for the study. When the research question begins with 'What', 'Why' or 'How', as it does in this study, and normally does with exploratory studies, a case study is fitting (Yin, 2018, p. 4; Saunders et al., 2019, pp. 186 & 197).

The research strategy of case studies is further distinguished into two dimensions (Saunders et al., 2019, p. 198). The first distinction is between single and multiple case studies, where the single case study is used in this research project. A single case study is suited to use when looking at a phenomenon that few already have observed or analysed before, and it is often used for extreme or unique cases (Saunders et al., 2019, p. 198; Yin, 2018, p. 53). With multiple case studies, more than one case is observed. The key is either to choose cases where you predict similar results to be produced, or to choose cases that have a contextual factor which is deliberately different from each other (Saunders et al., 2019, p. 198). Multiple case studies are viewed as being more robust since the evidence from these studies often are considered more compelling (Herriott & Firestone, 1983, as cited by Yin, 2018, p. 54). However, multiple case studies require much more resources and time than a single case study,

and due to our time limitation of four months, the single case study deemed more appropriate (Yin, 2018, p. 54). The second distinction is between holistic and embedded cases, and this distinction is referring to the unit that is analysed (Saunders et al., 2019, p. 199). A holistic case study refers to when you look at the case as a whole, for example an organization, while an embedded case study examines more than one unit, for example several departments in an organization. In this study, a holistic case study is fitting since the study looks at Mestergruppen and its overall management, while using the use-case of a garage-configurator to look even closer at how sustainability indicators can impact the organization.

3.1.5 Time horizon

The time horizon for this study is cross-sectional (Saunders et al., 2019, p. 212). The two time horizons that can be chosen are longitudinal or cross-section. A longitudinal time horizon looks at events over a longer time period, while a cross-sectional time horizon looks at a particular phenomenon or “snapshot” at a specific time. This study aims to take a closer look at sustainability indicators’ role and how they impact an organisation today, more specifically how they can impact decisions and control. It could be interesting to explore the development of sustainability indicators by using a longitudinal study to see how an organization, or several organizations, integrate them in their management and further how they can impact decisions and control, but since the timeframe for the study is only four months, a cross-sectional study is more fitting. In addition, since the study is based on the situation today, and the interviews were conducted over a short period of time, a cross-sectional time horizon is suitable.

3.2 Data collection

To explore the research question of this study, it was necessary to collect both primary and secondary data. The primary data in this study is collected from semi-structured interviews, and the secondary data is collected from relevant reports, documents online, research papers and webpages. Primary data is new data that has been collected by the researcher itself for a specific purpose while secondary data is data collected for some other purpose, such as raw data or other publications that can be further analyzed to provide additional or new knowledge (Saunders et al., 2019, p. 338). Section 3.2.1 will introduce the choices made for the primary data and how the data was collected. Section 3.2.2 will present a description of how the secondary data was collected which involves all the supplementary data for the study.

3.2.1 Primary data

A research interview is described by Saunders et al. (2019, p. 815) as a “purposeful conversation between two or more people requiring the interviewer to establish rapport, to ask concise and unambiguous questions and to listen attentively”. A reason for using research interviews is to gather data that is valid, reliable, and relevant for the research question (Saunders et al., 2019, pp. 434-435).

Semi-structured interviews

In this study a non-standardized type of interview was used, more specifically the interviews conducted were semi-structured (Saunders et al., 2019, p. 437). This interview type fits well for our research because according to Saunders et al. (2019, pp. 442-444) this type of research interview is often used to collect data when having a qualitative research method and an exploratory research purpose as we have. In addition, with an exploratory study, semi-structured interviews allow us to gain central and important background or contextual material for the study (Saunders et al., 2019, p. 443).

A semi-structured interview involves a predetermined list of themes and often some key questions connected to the themes, and the conduction of every interview is guided by this list (Saunders et al., 2019, p. 437). In addition, a semi-structured interview can be the most advantageous approach of data collection when there are many, and complex or open-ended questions, and a varying logic of the questioning (Saunders et al., 2019, p. 445). To gather relevant data and gain valuable insight, we included many and complex questions in the interviews we conducted, which is shown in the interview guides in Appendix 1 and 2.

A part of the conduct of semi-structured interviews is to make an interview guide in advance, which is defined by Saunders et al. (2019, p. 806) as a “plan for conducting a semi-structured interview containing opening comments, list of themes, questions and prompts to encourage discussion, and comments to close it”. We made two types of interview guides, consisting of main questions and follow up-questions within specific themes related to the research question of the study. The interview guides were made for the two interview rounds respectively. It was necessary to tailor these guides to each participant because of differences in their position in the organization. Each participant got the interview guide in advance to prepare themselves, and Saunders et al. (2019, p. 452) mention this as a good way of informing the participants

about what information the researchers are interested in gaining and an opportunity for them to prepare themselves.

To encourage the participants to provide extensive answers, it was important to ask open questions and start the questions with words like: “what”, “how” or “why” (Saunders et al., 2019, p. 459). In addition, we tried to avoid asking leading or proposing questions (Saunders et al., 2019, p. 460). According to Saunders et al. (2019, p. 461) it is advantageous to both audio-record and take notes throughout the interviews because the notes can provide with a backup for the recordings and a concentration or summary of the data collected. We considered this to be beneficial when collecting the data, and we did therefore take notes and audio-record during the interviews. Furthermore, in advance, we decided that one researcher should ask the questions while the other one should take notes. According to Saunders et al. (2019, p. 463), some advantages of audio-recording are for instance accurate and unbiased records, and the opportunity to use direct quotes and to re-listen to the interviews, especially when analyzing the data. A disadvantage of audio-recording is the time required to transcribe them. Despite this, we considered the advantages of audio-recording to outweigh the disadvantages for our study. We made a consent form that was sent to all participants in advance of the interview to ensure we got permission to audio-record.

Due to the current COVID-19 pandemic we conducted the interviews digitally through the data program “Microsoft Teams”. Mirick & Wladkowski (2019) describe how Skype (similar to Microsoft Teams) is a recommended additional tool for qualitative interviews and mention that it offers benefits for both the participants and the researchers. A benefit mentioned is for instance the flexibility in term of both time and space. We experienced that the digital interviews made it possible for the participants to visually show information and diagrams, which was beneficial for us as researchers when trying to understand different aspects. We also experienced that conducting digital interviews made it easier for the participants to participate.

The participants

To collect the primary data, four interviews with three different employees in Mestergruppen were conducted. One of the participants was interviewed in two rounds. For our research we requested participants from different areas of Mestergruppen, specifically managers in different departments. We did not choose the participants ourselves, they were chosen internally by Mestergruppen. Saunders et al. (2019, p. 318) mention heterogeneity as a relevant

technique when having research that is based on key themes and where the likelihood of the sample being representative is low and dependent on the choices of the researchers. Our sample is somehow heterogenous because of the different positions and responsibilities of the participants. At the same time, the sample lacks heterogeneity because it is a small group, and because we did not choose the participants ourselves. We experienced that having interviews during a pandemic might have affected our sampling.

Purposeful sampling is a term for a systematic assessment of the most relevant and interesting informants (Johannessen et al., 2020, pp. 58-59). Our sample of participants are managers from different levels and departments in Mestergruppen. This sample will not be representative for Mestergruppen as a whole since qualitative studies aim to include a limited number of informants to gain as much and relevant information about the phenomenon that is being investigated as possible (Johannessen et al., 2020, p. 57). We asked our contact person in Mestergruppen to get a sample of participants from the management and leadership team or from other levels in the organization. Since our research question is about the role of sustainability indicators and their impact on decision-making and control, it was logical to interview people from the management level in the organization because of their position and the associated information richness.

The size of the sample is based on the richness of information each participant can contribute with, and will vary depending on the research question, data collection and analysis, and the available resources (Johannessen et al., 2011, pp. 110-111). We started with three interviews in the first interview round, and thereafter conducted one interview in the second round. It was useful to conduct a second interview with Participant 1 because of the participant's position, responsibility within the organization and knowledge. A total of four interviews gave us the information we needed for our study.

Interview	Date	Length (min)	Participant	Position
Round 1				
1	18.10.2021	1:06:16	1	Director
2	21.10.2021	00:44:07	2	Manager in a subsidiary
3	10.11.2021	00:52:49	3	Manager
Round 2				
4	16.11.2021	00:35:56	1.2	Director

Table 1 - Overview of the participants and the interviews

Tabel 1 summarizes the interviews conducted and includes the interview date, length of the interview, and a generalized title for their positions in Mestergruppen. The participants will further in the study be referred to by their number (1, 2, 3 & 1.2). We were in contact with other potential participants, but since sustainability is a new area for Mestergruppen, potential participants' lack of relevant information and time, and an ongoing pandemic, made it more appropriate for us to concentrate on the participants that could provide us with useful and relevant information.

3.2.2 Secondary data

Saunders et al. (2019, p. 342) mention three broad types of secondary data, and one of them is document secondary data. Document secondary data is what we used the most in our research, and according to Saunders et al. (2019, p. 345), this data is often used in combination with the collection of primary data for research projects and include "text, audio and visual media". Document secondary data is also frequently used in case studies of specific organizations (Saunders et al., 2019, p. 348). For the case study of Mestergruppen it was valuable to use document secondary data in addition to the primary data. We mainly collected document secondary data from Mestergruppen's website directly, with the addition of reports and other textual documents. The website was used to gather data about for instance the organization and its values. In addition, we used the annual climate and environmental report for Mestergruppen's headquarters from 2020 to get an overview of its situation regarding sustainability. The ethical guidelines document was also relevant to include in the collection of secondary data.

3.3 Data analysis

A thematic analysis was the technique chosen to analyze the collected data (Saunders et al., 2019, p. 651). When analyzing qualitative data, a thematic analysis is suited to use because it is flexible, systematic, and accessible. The approach is flexible because it does not tie itself to any specific research philosophy, it is systematic because it offers a logical and orderly way to analyze the qualitative data, and it is accessible because you can use it for a deductive, inductive or abductive approach (Saunders et al., 2019, pp. 651-652). The thematic analysis, for the abductive approach, can begin by analysing the themes derived by theory, and then modify these as the datasets are explored further (Saunders et al., 2019, p. 652).

There are four steps to the procedure of the thematic analysis. The first step is to become familiar with the data that are collected through the transcription (Saunders et al., 2019, p. 652). Transcription of the interviews happened right after the interviews were conducted to make sure we had it in our memory and to avoid doing all the transcription work at the end because it can be extremely time consuming (Saunders et al., 2019, p. 645). We used a Computer-Assisted Qualitative Data Analysis Software (CAQUDAS) called NVivo to transcribe the interviews to save time. After NVivo finished the transcription, we listened to the audio file while reading through the transcription material to ensure accurate transcription because this can be challenging, even when using a software (Saunders et al., 2019, p. 645). Here we manually cleaned our data by replacing wrong words, corrected grammatical errors, and eliminated repeated and non-relevant words. To ensure correct citation, we sent the participants the quotes from them that we wanted to use in the study to get an approval of these. This approval helped us to ensure accurate data.

The next step in the thematic analysis is to code the data, which means to group data with similar meanings together (Saunders et al., 2019, p. 653). The units of data can for example be a single word, a sentence, or a paragraph. Coding the data is an important step in the analysis because it helps managing all the data. The original data units are regrouped together with data units of similar meaning, which makes it easier to examine these data in relation to each other. The coding work in this research was also done in NVivo. We used our research question and chosen theory as a basis when creating the codes, and coded all the data we deemed to be appropriate when going through the transcriptions (Saunders et al., 2019, p. 653). We developed new codes when needed in this process, and the development of new codes required us to re-read and thereafter re-code everything to fit the current list of codes (Saunders et al., 2019, p. 655).

The third step is to search for themes, patterns and to recognize relationships in the data when collecting and coding them (Saunders et al., 2019, pp. 656-657). This is to some extent done in the second step of the analysis, but only when you have coded all the datasets you can fully search for themes (Saunders et al., 2019, p. 657). A theme is a broader category that includes several of the codes already made, but can also be a single code, and the themes will contribute with important ideas and information for the research question. Our initial coding and further categorising resulted in these primary themes: *Sustainability in general, TBL, MCS (with the secondary themes of belief system, boundary system, diagnostic control system and interactive control system), key stakeholders, and sustainability in the value chain.*

The fourth, and last step of the thematic analysis is to refine the themes and the relationships linking them (Saunders et al., 2019, p. 658). The themes may, in this step, be split or combined or even discharged. Some changes were made in our initial themes which led to the main themes: Sustainability, Belief system, Boundary system, Diagnostic control system, Interactive control system and Stakeholders.

3.4 Research quality

It is necessary for the research study to be evaluated to make sure that the quality of the methodological choices is good. Some types of measurement validity can be suitable to use for quantitative research studies, but inappropriate to use for qualitative research because these concepts, if applied in a rigid way, can make it difficult to demonstrate the high quality and credibility of a qualitative study (Saunders et al., 2019, p. 216). Saunders et al. (2019, p. 216) also points out that “qualitative research is not necessarily intended to be replicated because it will reflect the socially constructed interpretations of participants in a particular setting at the time it is conducted”. There are four important tests for establishing the quality of the study according to Yin (2018, p. 42). These tests are *construct validity*, *internal validity*, *external validity*, and *reliability*, but when evaluating an exploratory study, as this research study is, internal validity is not relevant, and will therefore not be included further (Yin, 2018, p. 42).

3.4.1 Construct validity

Construct validity is about correctly identifying operational measures for the idea that is being studied (Yin, 2018, p. 42). There are several tactics recommended to use to increase the construct validity namely using multiple sources of evidence and to have the draft of the case study reviewed by key informants, in this case, the participants (Yin, 2018, p. 44). For this study, the first tactic of multiple sources included interviews from participants with different positions in the organization. In relation to this tactic, secondary data such as Mestergruppen’s website, the annual climate and environmental report and ethical guidelines were also used. Based on this we accomplished a variety of sources to a certain degree. To fulfil the second tactic the quotes from the participants we wanted to use were sent to the participants.

3.4.2 External validity

External validity looks at whether the findings of a case study can be generalized to other contexts of relevance (Yin, 2018, p. 42; Saunders et al., 2019, p. 216). A single case study, where the data are from a small sample, cannot be used for an entire population to make statistical generalizations (Saunders et al., 2019, p. 451). With qualitative studies it is normal to look at the transfer of knowledge instead of generalization, which regards the study's ability to establish descriptions, interpretations, concepts, and explanations that are useful within other areas than the one being studied (Johannessen et al., 2020, pp. 251-252). The collection of several sources described in 3.4.1 helps to achieve a transferability. It is also important, in qualitative studies, to have an objective vision and to make sure that the findings are a result of research, and the verifiability will ensure this (Johannessen et al., 2020, pp. 252-253). Verifiability shows to what extent the qualitative research can be confirmed through similar research from other researchers. A detailed description of our methodology choices and analysis process was used to achieve this.

3.4.3 Reliability

Reliability involves seeing if the data collection technique gives consistent findings, in other words, if similar observations and conclusions would be made if other researchers conducted the same study (Saunders et al., 2019, p. 815). Johannessen et al. (2020, p. 250) points out that when doing a qualitative study, the demand for reliability is not particularly appropriate because it is not used structured data collection techniques, the observations can be value loaded and depend on the context, and the researcher uses themselves as an instrument based on experience. Transparency from the researcher is important, and insights into the methodological choices, data collection and data analysis can contribute to more reliability because the reader can evaluate the reliability themselves. To strengthen the reliability of this study, we have given an in-depth description of the context and the methodological procedures in Chapter 3. In addition, the interview quotes, representing the study's raw data, are provided in Chapter 5.

Threats to reliability

There are several threats that can occur when trying to ensure reliability: *participant error*, *participant bias*, *researcher error* and *researcher bias* (Saunders et al., 2019, p. 214). *Participant error* involves factors that alter the way a participant performs in a negative way.

To reduce the chances of participant error, participation in the study was voluntary for both the company and the participants, and the participants were able to choose the time for the interview. In addition, the expected timeframe for the interview was informed to all participants so they knew what to expect, which might have reduced the risk of short and incomplete answers because the participants feel a time pressure. Based on this, we believe that the chance of participant error in our study is small.

Participant bias involves factors that may induce false responses (Saunders et al., 2019, p. 214). To avoid this, the interviews were completed digitally and the participants were anonymised to reduce the chance of them withholding information to shield themselves or in fear of being overheard. The fact that the interviews were audio recorded can lead to the participants being careful with what information they give, but since the participants were well informed about both the interview process and questions, and were participating voluntarily, we do not believe that this has led to any bias. Before the interviews, we corresponded with the participants over mail to build trust, and in the beginning of the interviews we had warm up questions. Throughout the interviews, we experienced that the participants shared both positive aspects and challenges within the company. We therefore believe that participant bias has not affected the study in any significant way.

Researcher error is any factor that can change the way the researcher interprets the data (Saunders et al., 2019, p. 214). This can be due to lack of preparation, misunderstandings or other factors. Since the study is using semi-structured interviews, this can increase the chance of researcher error because every aspect of the interview is not structured beforehand. To avoid this, we asked clarification questions throughout the interviews to make sure we understood what the participant meant. In addition, the audio recording reduced the chance of researcher error because we could go over the audio several times to make sure we understood and quoted the participants correctly. Since we were well prepared before all the interviews the chance of researcher error is viewed as small.

Researcher bias is factors that induce bias from the researcher in the recording of responses (Saunders et al., 2019, p. 214). This can for example involve that the researcher lets his or her subjective views affect the study and the interpretation of the data. To avoid this, we tried to ask open questions and not lead the participants into any answers. The interviews were always conducted with both of the researchers present, which Saunders et al. (2019, p. 214) point out as a way of reducing the chance of researcher bias, and after the interviews we discussed the

findings and shared our perceptions. Because we both participated in the collection, analysis and interpretation of the data, we believe that the chance of researcher bias is small.

To summarize, after our opinion we think that the reliability of this study is largely taken care of because the data collection and analysis is completed in a reliable way.

3.5 Ethical considerations

When conducting a study and gathering information to analyze, for example about an organization or individuals, there are ethical considerations that need to be addressed (Saunders et al., p. 252). Saunders et al. (2019, pp. 252-253) refer to ethics as “the standards of behavior that guide your conduct in relation to the right of those who become the subject of your work or are affected by it”. To address the ethical considerations, Saunders et al. (2019, pp. 257-259) present several ethical principles that need to be sustained during all research studies and these principles lay the foundation for the ethical considerations of this study.

The first principle is about voluntary participation that can be withdrawn at any time (Saunders et al., 2019, p. 258). The researchers should make sure that no participant is harassed or forced into participation, that the participants know about the timeframe of the participation and the purpose of the study, and that they can determine how they wish to take part in the study, including the option to withdraw. To ensure that this principle was followed, a consent form, presented in Appendix 3, was sent out to all the participants. This form includes information about the research project, expected timeframe for the interviews, and clear information about the voluntary participation and the right to withdraw at any time. It also includes the contact information of all the researchers. Before an interview was conducted, we ensured that the participant had signed the consent form that was sent in advance.

Another important principle is to respect the participants privacy, anonymity and to ensure confidentiality when collecting data (Saunders et al., 2019, p. 258). In the study, this was done by giving the participants anonymous names, for example Participant 1, and anonymizing their position titles. The positions were only roughly divided into categories such as “manager” or “director”. The consent form also includes information about anonymity and confidentiality, and an option for the participants to choose not to include the roughly categorised position at all.

Responsibility when analyzing data and reporting the findings is also a crucial principle (Saunders et al., 2019, p. 258). Accurate reporting of findings, both from primary and secondary data is essential to correctly use the data. To ensure this, notes were taken during the interviews and audio was recorded to accurately transcribe the interviews afterwards. Audio recording is a good tool to use because it gathers all information, not only what the interviewers managed to note, or what was anticipated to find (Saunders et al., 2019, pp. 257-258). The transcription program, NVivo, was later used to transcribe the audio into text format. By combining transcription from a computer program with manual editing, the accuracy of the interviews are upheld when turned into an analysis. All participants were also given the chance to read through the quotes before the publication of this study.

The principle of avoidance of harm is also considered from the focus on privacy, anonymity and confidentiality (Saunders et al., 2019, pp. 257-258). All data collected (notes, audio recordings, transcriptions and coded data) were only saved and stored with the anonymized names, in compliance with Saunders et al. (2019, p. 646) who state that confidentiality and anonymity should be preserved when storing data. It is also necessary to collect and store data in compliance with legislations, and this research project was therefore reported to the Norwegian Centre for Research Data (NSD).

3.6 Limitations

There are certain limitations to this study. The first limitation involves the time limit of the study which was one semester (approximately four months). The second limitation is based on the methodological choice to conduct a single case study. This type of study gives in-depth data and knowledge about a phenomenon, and it is suited for exploratory studies, but single case studies are also harder to generalize to other contexts. Another limitation is the number of participants for the study. We limited the study to three participants because of the circumstances, where one participated in two interviews. The participants were a sample of two managers and a director in Mestergruppen. The participants' experiences, views and opinions are unlikely to represent Mestergruppen in general since the organization is large and consists of multiple daughter companies. Furthermore, another limitation involves the language chosen for the interviews. Most of the interviews were conducted in English, except for one because this interviewee preferred to do it in Norwegian. We chose to conduct the interviews in English to avoid the step of translating them and to avoid other potential

misinterpretations as a result of the translation. Despite this, we ended up having to translate one interview because we wanted the valuable insights and information from this participant. We knew there was a risk of incomplete answers by conducting the interviews in English, but the benefits of doing it, such as more accuracy in the data, outweighed the limitations in our opinion.

3.7 Summary of the methodology

Based on the argumentation from Chapter 3, Table 2 summarizes the methodological choices of the study.

Area	Methodological choices
Research approach	Abductive
Research purpose	Explorative
Research method	Qualitative
Research strategy	Single case study
Time Horizon	Cross-sectional
Data collection	
<i>Primary data</i>	Semi-structured interviews
<i>Secondary data</i>	Reports, website, and other textual documents
Data analysis	Thematic

Table 2 - Summary of the methodology

4. Empirical background: Mestergruppen

In Chapter 4, the organization Mestergruppen will be presented as the empirical background for this study and the use-case of a garage-configurator will be introduced. In section 4.1 the empirical context will be described, before section 4.2 presents the organization. In section 4.3 Mestergruppen's sustainability work will be explained.

4.1 The construction industry in Norway

The construction industry in Norway can be divided into three sectors: the construction of new buildings, rehabilitation of buildings, and facilities as for instance road projects, tunnel- and bridge-building and port facilities (SSB, 2021). The industry stands for more than 15% of Norway's emissions and has a huge potential to become more sustainable and to reduce its emissions (Asplan Viak, 2019). Norway has a huge resource in waterpower, which is both a clean and a cheap energy resource. This results in low emissions from energy usage in Norwegian buildings, but the amount of energy used is high, standing for approximately 40% of total energy usage in Norway. In the last decade the perspective on energy and environment performances for the construction industry has broaden. From only looking at the operating phase, the focus now includes material usage, emissions at the construction site and the actual building process. Norway's construction industry has started to take responsibility of reducing both their direct and indirect emissions and can document this through for example BREEAM certification of buildings or "Miljøfyrtårn" certification (Bygg21, 2018; Miljøfyrtårn, n.d.).

4.2 Mestergruppen

Mestergruppen is one of the biggest groups in the construction industry in Scandinavia and works with building material trade, house chain operations and real estate development (Mestergruppen, n.d.a). The origin of Mestergruppen comes from the foundation of Mesterhus in 1970 (Mestergruppen, n.d.c). The background of the foundation was a desire from a group of builders to directly be able to enter into purchasing agreements with manufacturers of building materials and thereby not be dependent on regional distributors of building materials. In 1995 Mesterhus turned into Mestergruppen. The group has evolved to also cover the local need for supplementary goods and goods that require large batch purchases in addition to their focus on direct deliveries.

In 2011 Mestergruppen was bought by the family-owned Norwegian investment company Ferd AS (Mestergruppen, n.d.c). In the years that followed, Mestergruppen continued to grow. In 2016 they bought Byggtorget, XL-BYGG and Blink Hus. The group Saltdalsbygg was bought by Mestergruppen in the fall of 2017 and in 2018 Pretre also became a part of the group. Mikkel Sandvik has since 2014 been the CEO of Mestergruppen and in 2020 Dag Mejdell took over as the chairman of the board (Mestergruppen, n.d.d; Mestergruppen, n.d.e).

4.3 Sustainability in Mestergruppen

Mestergruppen shows its dedication to become more sustainable in several ways. The following sections will elaborate on Mestergruppen's sustainability work. Section 4.3.1 presents the values of Mestergruppen and the ethical guidelines. Section 4.3.2 explains their sustainability initiatives, and the last section, 4.3.3, introduces the rankings that Mestergruppen has received.

4.3.1 Values and ethical guidelines

Mestergruppen has four core values: *reliable*, *efficient*, *team-player*, *inventive* (Mestergruppen, n.d.f). The first value, *reliable*, is about Mestergruppen being trusted and keeping what they promise, too all stakeholders. The second value, *efficient*, focuses on efficient operations and reduction of waste. The goal of Mestergruppen is to be the most efficient operator in the industry. The third value, *team-player*, relates to the interaction between the employees and sharing of knowledge to become stronger. The fourth and last value, *inventive*, focuses on the movement of positions through innovation and to positively contribute to the society.

In addition to their values, Mestergruppen have ethical guidelines that lay the foundation for their work (Mestergruppen, n.d.g). These guidelines apply for all the employees, hired help, and members of boards in Mestergruppen and the subsidiaries. The purpose of these guidelines is to make sure Mestergruppen follows the law and that the employees act responsible, considerate and in tack with all regulations, principles, and laws. For instance, fighting black labor is one important subject in these guidelines.

4.3.2 Sustainability initiatives

Mestergruppen is currently working on becoming more sustainable and wants to develop products and services that can contribute to this (Mestergruppen, n.d.b). Since the construction industry stands for a large amount of Norway's total emissions, Mestergruppen's main focus is to combat the climate changes, which reflects the SDG number 13. The organization's long-term goal is to become climate neutral. For Mestergruppen's main office, traveling is the biggest contributor to emissions. Some actions taken to reduce traveling is a new traveling policy and a focus on changing employees' attitudes.

The company has signed the greenwashing poster from "Skift", "Miljøstiftelsen", ZERO, Worldwide foundation for nature (WWF) and "Framtiden i våre hender", which means that Mestergruppen distances itself from greenwashing (Mestergruppen, n.d.b). Mestergruppen has also, as the first organization in Norway, started to calculate greenhouse gas on some of its buildings to find more environmentally friendly materials, building methods and energy sources. The calculations show the emissions throughout the lifetime of the building, and they are based on environmental data from Mestergruppen's product suppliers. These calculations can also be seen by the customers when they are ordering a house, in the same way as with the garage configurator.

Use-case: Garage-configurator

In collaboration with TERRAVERA, Mestergruppen wants to develop sustainability indicators so they can implement them into the garage-configurator, which is a parametric 3D-model of a garage. This garage-configurator is under development by Mestergruppen as a tool for the end user and can be used to adjust different dimensions of the garage. The adjustments done by the customer will change the price and CO₂ emissions simultaneously and dynamically. When the customer is satisfied, the design will be locked, and based on this they can ask for an offer that automatically will be sent to the producers.

4.3.3 Rankings for sustainability

The Mestergruppen group has in total 24 companies and departments that are "Miljøfyrtårn" certified, and in 2021 the headquarters of Mestergruppen also became "Miljøfyrtårn" certified (Mestergruppen, n.d.b). The certification gives Mestergruppen the opportunity to measure emissions and take actions to reduce them, and they are currently working to get even more

actors certified. Their environmental achievements are documented in a climate and environmental report every year and it shows both positive and negative achievements. The report from 2020 was the first one made in collaboration with “Miljøfyrtårn”.

5. Results

Chapter 5 presents the findings from the semi-structured interviews and is structured based on the main themes from the data analysis in section 3.3. Firstly, section 5.1 introduces the findings from the theme of sustainability in general. Secondly, in section 5.2 to 5.5 the findings of the MCS are introduced, more specifically findings from the belief system, boundary system, diagnostic control system, and interactive control system. Lastly, in section 5.6 the findings from Mestergruppen's stakeholders are presented before a summary of all the findings are shown in a table in section 5.7.

5.1 Sustainability

Sustainability as a theme includes findings regarding Mestergruppen's situation today and how it works towards achieving a TBL by balancing the financial, social, and environmental dimension.

5.1.1 Finding 1: Mestergruppen has an awareness of sustainability

It seemed to be a unanimous understanding among the participants that sustainability in Mestergruppen is a new area. For instance, Participant 1 said that "Mestergruppen has started a journey towards a more strategic focus on sustainability and the organization. When I started 2,5 years ago, we had little focus on this, apart from our ethical guidelines". In relation to this, most of the participants have noticed that since this is a new topic for Mestergruppen, it has not been fully developed a culture for sustainability yet. Also, Participant 2, which is a manager in one subsidiary, talked about the culture in the subsidiary: "We have not had a culture for it earlier, but it is about to come". Nevertheless, in relation to the use of different SDGs in Mestergruppen, Participant 1 mentioned in the second-round interview that they are about to change the culture and knows what needs to be done to develop a culture for sustainability:

Once you start having these [SDGs] as the starting point of each presentation you hold, then something happens with the minds of people working at the company, those driving the acquisitions, those doing production or sales, you start to use different words, different methods, and you sell the products in a different manner. So, I have great expectations

about how this will change the culture of Mestergruppen and thereby the decisions being made by each employee. (Participant 1.2).

Furthermore, regarding sustainability challenges for Mestergruppen, Participant 1 pointed out that their number one goal is to reduce their CO2 emissions and that they need to understand the amount emitted both directly and indirectly. In relation to this, Participant 1 mentioned three main initiatives:

Number one is to become certified by “Miljøfyrtårn” [...], the second most important initiative is to do climate gas calculations on the houses we build [...], and the third initiative is to look at concepts for the circular economy, namely, how to reuse building materials. (Participant 1).

Reusing materials is also something Participant 2 is aware of in the subsidiary:

We are in the wood industry where there is much waste and talk about sorting waste of plastic, hard plastic, cardboard, and wood. Now, wood is, to a much larger extent, reused than before. We reuse materials in our production. The material we cannot use as a part of our production will be transferred to another one and so on. We were not very good at this before. (Participant 2).

Participant 3 also mentioned that important initiatives are to get certified and that it is important to start calculating their emissions but pointed out that “the challenge today is having sufficient climate data digitally available and calculating in the right units (meters, square meters, cubic meters, etc.)”. Other challenges mentioned by Participant 2 are for instance too much transport and waste in addition to wrong produced and ordered goods. Participant 3 also stated that waste and transport are some challenges that both Mestergruppen and the construction industry are facing today.

Regarding the challenges Mestergruppen is facing today, Participant 3 mentioned that “There are solutions out there as long as they are efficient and not more expensive than the alternative already used. That seems to be the clue for a quick adoption of these kinds of solutions in the market”. It seems like all the participants know about many of the challenges Mestergruppen is facing today regarding sustainability, and in order to become more sustainable Participant 3 explained that:

Well, to be honest, I think we have the right focus and are trying hard to gain more knowledge in order to be able to measure our emissions and to reduce our emissions. Also, the commitment from the management is appreciated and crucial for us to succeed. (Participant 3).

Participant 1 explained that first they need to map the emissions and thereafter identify what actions they need to take in order to reduce them. In relation to this, Participant 1 said that:

So that means that every department will have their own emissions accounts and emission reductions goals and we will spend 2021 just mapping their emissions first and then state the goals afterwards. We have some hypotheses of how much it would be possible to reduce, one being our direct emissions. With the indirect emissions, it's more complicated because we don't control them ourselves. (Participant 1).

It is also an awareness regarding the responsibility for sustainability among the participants. They jointly have an idea of Mestergruppen having the responsibility when it comes to reducing CO2 emissions and becoming more sustainable in the future. In relation to this, Participant 3 mentioned that:

[...] Mikkel Sandvik [CEO] and Lars-Fredrik Forberg [Director of housing development and sustainability], attended the Computer World Congress and the message was clear. It is our responsibility to reduce emissions and a part of that journey is through advancing digitally. (Participant 3).

Furthermore, all the participants mentioned the certification of "Miljøfyrtårn" in the interviews as an important initiative for Mestergruppen to become more sustainable. Participant 1 explained that Mestergruppen is working to get the whole group certified by "Miljøfyrtårn" and that they started by getting the headquarters certified first. Participant 1 also said that they distribute the responsibility from the top (HQ) down to the local responsible of "Miljøfyrtårn". Furthermore, Participant 3 explained that they are a group of about 10 people today who are involving in "Miljøfyrtårn", but that they are becoming more people as time goes on. For instance, Participant 1 mentioned in the second-round interview that "We just started with Pretre and our retail stores and take it from there". Participant 2 also explained that Pretre (subsidiary) is certified with "Miljøfyrtårn" and that this had implications for them on for instance the procurement criteria and outcome criteria for choosing suppliers.

Participant 3 also stated that “[...] I think awareness is the key in general. And the fact that so many of our members are getting certified is the right step forward”. In relation to being certified through an environmental certificate such as “Miljøfyrtårn”, Participant 1 explained that “[...] this gives us an environmental management tool so that we have an overview over the direct emissions and that we can target how to reduce them”. In addition, Participant 1 mentioned that they are now mapping the CO₂ emissions of their departments and subsidiaries. Participant 3 also stated that they have started mapping both the direct and indirect emissions:

“Miljøfyrtårn” helps us to calculate and report emissions and it’s divided into three scopes. Scope one is direct greenhouse gas emissions from sources owned or controlled by the company, such as Pretre and Saltdalshytta who are producers. Scope two is indirect greenhouse gas emissions as a result of activities from our units, but caused by sources owned by others, in other words not in Mestergruppen’s control. Scope three is other indirect emissions from sources owned or controlled within the company, such as extraction and production of raw materials and suppliers of waste disposal services etc. You basically report on both direct and indirect greenhouse gas emissions, and if you include scope three, you have the whole value chain. (Participant 3).

In relation to calculating CO₂ emissions, Participant 1 mentioned that Mestergruppen is now trying to develop a dynamic carbon calculator and is therefore collaborating with TERRAVERA. For this development Participant 1 said that the idea is to use it in for instance a 3D model of a garage so the end user can see how the CO₂ emissions and price updates with different adjustments of the garage. In addition, Mestergruppen is planning on implementing information based on other SDGs to the garage in the future. Participant 3 also mentioned this 3D tool for calculating CO₂ emissions in the interview. In addition, Participant 1 said in the second interview that they break down their emissions across the value chain in different categories when they look at their emissions and use these calculations to make decisions in Mestergruppen.

Furthermore, in the first interview Participant 1 explained Mestergruppen’s focus on the SDGs: “Mestergruppen’s main focus is on sustainability goal number 13 which is to fight the climate changes. But we do also have focus on ethical trade and other sustainability goals” and “We do believe that we’re starting to look into circularity [...] so number 12 is also important, but we have to take it step by step [...] maybe in a couple of years”. It seems that

the SGDs are a new area and not fully implemented in Mestergruppen since the other two participants did not have a clear answer regarding this theme in the interviews. For instance, Participant 2 took for granted that these goals were implemented: “I think they [the SDGs] are well implemented in the new sustainability strategy of Mestergruppen. Without being fully sure, I assume it and take it for granted that they are the basis for the sustainability strategy”. Participant 1 also mentioned that in the future they will have better goals:

So, what we are discussing now is for example whether we should look at the Ethical Trade initiative, which is a Nordic initiative, and become a member of that or if we should be a member of the UN Global Compact [...]. That will help us identify our goals for each sustainability development goals [...]. (Participant 1).

These quotes lead to the first finding regarding sustainability: *Mestergruppen has a good awareness of the situation today regarding sustainability. They are aware of the challenges, their responsibility, and what actions they need to take in the future.*

5.1.2 Finding 2: The financial, social and environmental dimension in Mestergruppen

Starting with the financial dimension, Participant 1 stated in the first interview that: “The requirements from the owners are to give a return on investment, that is the number one goal”. Furthermore, Participant 2 mentioned how the financial focus is in Pretre and Mestergruppen: “The shareholders have invested in Pretre and Mestergruppen to get a return. They have a required rate of return that we must follow up”. In addition, Participant 3 mentioned that Mestergruppen has focused on monitoring typical financial outcomes as for instance “[...] revenue, EBITDA [...]”. Also, Participant 3 explained how Mestergruppen has worked to gain a better position in the market:

We started out as a somewhat small player in the market, and since 2014, our revenue base is about seven times what it was then [...] we have basically grown through a number of acquisitions. That is the way we have gained a larger market share and grown as a company. (Participant 3).

Regarding the social dimension, Mestergruppen’s ethical guidelines seem to have a central part in the organization. For instance, in the first interview Participant 1 said that:

I think they [the ethical guidelines] are really good because it's about the minimum requirements on how to comply with the laws, how you should act as a person, and what our suppliers should comply with which is also very important. (Participant 1).

Also, Participant 1 mentioned that "[...] equality between the sexes and all of this are [...] in our ethical guidelines". Furthermore, Participant 3 mentioned important aspects in these guidelines:

In our ethical guidelines, we have loyalty, respect, and consideration to show loyalty and to be respectful and considerate, respecting consideration for the environment, other people, and their property to behave trustworthy with colleagues, suppliers, customers, and other business connections. (Participant 3).

In addition to this, Participant 2 explained the importance of the people and HSE (Health, Safety and Environment): "[...] it has been the people who are important. Every fool can buy a machine but taking care of the good people is more demanding than buying a machine" and "[...] the instructions we make focus on HSE in a large degree".

Lastly, in relation to the environmental dimension, Participant 1 mentioned in the first interview that "we do believe that we're starting to look into circularity" and looked at concepts for circularity in for instance these two shades: "Number one is to redesign our houses so that we can disassemble them and take the building components apart and reduce them. Number two is to create recycling stations all over Norway". In addition, Participant 2 mentioned that they have a focus on reuse in the organization: "It's not about if the quality is poorer for the wrong produced goods, it is about that it does not fit the purpose and that one can reuse it. That is what we are focusing on". Furthermore, an important aspect of the environmental dimension is the already mentioned 3D tool for calculating CO2 emissions. Also, in the second interview Participant 1 mentioned that they are now, to a large degree, focusing on avoiding greenwashing in Mestergruppen.

Looking at the financial, social, and environmental dimension in Mestergruppen altogether, it seems that there has been a better knowledge and focus on the financial and social dimension across the organization. This becomes clear when Participant 1 mentioned that "[...] finance is 90 percent and then sustainability is 10 or less at the moment" and "[...] we cover a third of the sustainability goals somehow in our ethical guidelines".

The quotes mentioned above lead to the next finding regarding the financial, social, and environmental dimension in Mestergruppen: *Regarding the TBL, “Profit” and “People” are more prioritized in Mestergruppen than “Planet” since this is a new focus area in the organization.*

5.2 Belief System

The belief system has two findings connected to it, that addresses the view of the values in Mestergruppen and the new vision of the company.

5.2.1 Finding 3: Values

The values in Mestergruppen are considered differently between the participants, especially how they affect their daily work. Participant 1 stated that “I do feel that the values blow through the work of most people employed”. Further, Participant 1 talked about the values more in general and said “Well, I think there’s nothing special, but we spent a lot of time cracking out these four and the vision. So, to us, they make a lot of sense. And they are relevant.”. The other participants were vaguer. We asked if the values affect the daily work and Participant 2 answered “Not so much, but there are small drips”. Participant 3 explained “Well, I mean, naturally it influences my behavior, but I will say most of it is common knowledge and expected behavior in most organizations, to be honest.”.

The relationship between sustainability and the values became clear when comparing the participants answers. Participant 2 stated that “As of now, it is not really defined in the values we flag out, but they will come.”, and continued by saying “Our values have largely been to take care of our people”. At the same time, Participant 2 was clear on the fact that sustainability will be included in the values in the future. Participant 1 also talked about this subject and said, “There is a link between our values and sustainability, but the link is weak”.

These quotes will therefore lead to evidence of the finding regarding values: *The impact and importance of the values are perceived differently between the managers and director, and sustainability is so far not fully implemented into Mestergruppen’s values.*

5.2.2 Finding 4: Vision

The vision in Mestergruppen is important for all the participants and they agreed on that it is a good vision with a focus on sustainability. Participant 1 said that “What is interesting for Mestergruppen now is that we just launched our new version so we say that now the time is ripe, we will change the building industry” and elaborated by stating that “We now have the technology that we need, the knowledge and also market opportunity to transform the building industry. Sustainability is an important part of that transformation”. Participant 2 also emphasized the focus on sustainability: “It is a completely new business strategy with vision that is being presented, and there I know that sustainability has a solid foothold”. Participant 3 explained “What we have is a vision [...] and an overall strategy to become carbon dioxide neutral”. Further, Participant 3 emphasized the inclusion of all employees in this vision:

Four times a year, our CEO has a presentation to all the employees called “Allmøte” and in the last “Allmøte” he stated: “The time is now. We must change the construction industry. And furthermore, by innovation, digitalization, and collaboration, we will ensure that it’s safe, efficient, and environmental from buying the first nail until the keys in the door. Every employee in Mestergruppen will work together to set a new standard for the construction industry. Also, we shall find solutions and take steps toward climate neutrality”. So, it’s a strong focus on sustainability from the top management. (Participant 3).

These quotes give evidence to the finding regarding Mestergruppen’s new vision: *Mestergruppen has a new vision that greatly focuses on sustainability, and it is communicated out to all employees and members.*

5.3 Boundary System

Within the theme boundary system there are two findings. These findings show the importance of following external and internal rules and how Mestergruppen can use guidelines to control the stakeholders, for example the employees and suppliers. The findings also discuss the consequences if rules, regulations, or guidelines are broken.

5.3.1 Finding 5: Rules and regulations

Mestergruppen is faced with several rules and regulations according to the participants, and the organization sets the boundaries for what is allowed and not, but there are no regulations for sustainability yet. The rules are viewed as important and necessary to follow by all participants. Participant 1 emphasized that “the building industry is quite regulated, so you have to adhere to or comply with a lot of laws and regulations in order to get to put up a house.”. Participant 2 also mentioned that “we have work regulations that are quite rigid.”, and Participant 3 gave examples of aspects that are not allowed in Mestergruppen “[...] no-go for corruption and bribes and never involve yourself in black labor, for instance.”. In addition, it is mentioned by Participant 1 that:

This [climate gas calculations] is not a regulation in Norway yet, but it will be, maybe within a couple of months, because the government has now proposed that climate gas calculations will be mandatory for professional buildings and apartment blocks. (Participant 1).

Based on the quotes, the finding of rules and regulations can be summarized as: *The building industry has a lot of regulations and Mestergruppen’s internal rules and regulations are to a great extent following the external ones. In the future there will be more regulations regarding sustainability.*

5.3.2 Finding 6: Internal guidelines

Mestergruppen has some internal guidelines in addition to the external rules and regulations. These ethical guidelines are meant to give direction for all employees, suppliers, and members of Mestergruppen. These guidelines seem to be well established and used as a guide of how to act in the organization (Quote by Participant 1 cited in section 5.1.2).

From the interviews it also became clear that the focus on sustainability is increasing in the guidelines. Participant 1 mentioned some guidelines for sustainability, “Well, it’s our travel guidelines. They are important. We have just revisited those because of the “Miljøfyrtårn” certification.”. Participant 2 talked about the basis for choosing suppliers and stated that:

Sustainability is the basis for all agreements that are made and for all purchasing agreements, so all suppliers to the subsidiary must be declared. There must be an EPD on

everything we buy. [...] in connection with the “Miljøfyrtårn” certification, we have done quite a lot on the procurement criteria and outcome criteria for choosing a supplier. It’s more about sustainability than price. (Participant 2).

The guidelines following the “Miljøfyrtårn” certification are pointed out by Participant 3, “In regard to sustainability, we just became certified at “Miljøfyrtårn”. So, we have a public approved organ, so to speak, that guides our daily routines within several areas such as work environment, waste, energy purchasing and transport.”. Participant 2 also emphasized that “We have gradually gained a lot of instructions regarding sustainability”.

It also became clear from the interviews that there are consequences if the guidelines are not followed. Participant 2 stated that “We do have sanctions, all depending on how serious it is.”. Participant 1 also talked about this, “So, if you are a member, you have a membership agreement. If you break some of those statutes, then we have to discuss the membership and the same with the employees as well.”. More specifically Participant 1 mentioned that:

Some of them are black and white, for example, corruption that is not accepted. Others are maybe more fluent. So, we don’t kill you if you travel by plane, of course, but black labor is a no-go. If you choose a supplier that has [...] a track record of many bankruptcies, you are allowed to do so, but you have to do the analysis properly. (Participant 1).

The finding for the guidelines is, based on the quotes above: *The ethical guidelines are important and the basis for most decisions taken in Mestergruppen. The guidelines focus on “People” but lack a focus on “Planet”.*

5.4 Diagnostic Control System

The findings within the diagnostic control system emphasizes the focus on sustainability plans and goals for Mestergruppen. The use of indicators, the lack of sustainability indicators and reporting on sustainability is also highlighted in the findings.

5.4.1 Finding 7: Goals and plans for the future

There was an unanimity among the participants regarding sustainability goals. They all agreed that to reach the goals set for sustainability, Mestergruppen needs to attain more knowledge and gather more data. Participant 1 stated that “So our goal is also to reduce carbon emissions

by 50 percent compared with 2020 levels within 2030 and take the necessary first steps towards climate neutrality in 2050”, but also pointed out that “We need to learn more before we can actually put forward concrete targets on each of the sustainability goals”. In the second interview Participant 1 talked about a goal which is “to reduce the building time from 9-12 months to 6 weeks, to half the production costs, and to achieve climate neutrality”. This goal was also mentioned by Participant 3, who further elaborated on that “[...] will enable this through prefabrication, sourcing of standardized elements and solutions and being efficient through standardized plan processes and well-planned flow of goods”.

To reach the goals, Mestergruppen’s short- and long-term plans are emphasized by the participants. Participant 1 informed that “We started to draft a strategy on sustainability. And we now also have an action plan”. Participant 2 also mentioned this:

The long-term goal is that we will assist the government in their goal of achieving the requirements of the Paris Agreement. The short term is to have a strong focus on factory location and how to get them “Miljøfyrtårn” certified. And in relation to that certification, we create an action plan that we follow up closely. (Participant 2).

The certification was also mentioned by participant 3, who also focused on the need for mapping emissions to gain more knowledge:

On short term “Miljøfyrtårn”. The headquarters got the certification only two months ago, so it is quite fresh, and we focus on helping our members to be certified and cooperating with our suppliers and NOBB to gather product data and convert it to elements and buildings. This is an ongoing project to calculate carbon dioxide emissions. And on long term, identify a circular business model, I guess, and of course to reduce waste and use of plastic. (Participant 3).

The quotes mentioned above gives the finding for goals and plans: *The number of sustainability goals are increasing in line with the focus on sustainability in the construction industry. Mestergruppen’s short term plans involve getting its members “Miljøfyrtårn” certified and to start mapping the emissions. The long-term plans are to become more circular and to lower the emissions to reach the goal of climate neutrality.*

5.4.2 Finding 8: Key Performance Indicators (KPIs)

Regarding KPIs, there was an agreement between the participants that financial KPIs are the most important and the ones they use the most, but there was ambiguity regarding sustainability KPIs and their design. Participant 1 stated that “So I would say they [sustainability indicators] are important, but not as much as financial goals.”. Participant 2 explained that “Most of the KPIs are directed towards the operations and profitability”, and examples from Participant 3 were: “[...] revenue, EBITDA, sale at the retailers, number of houses built, number of cabins built, gross margin, etc.”.

Regarding sustainability KPIs, Participant 1 explained that “Each director would have a goal on emissions next year. [...] So, it’s not a concrete KPI, but it’s more seeing that you will do this activity and something good will come out of it”. Participant 1 continued by saying “We don’t have any KPIs yet for sustainability, I would say, we will have it the next year and we can make targets for emission reduction”. Furthermore, Participant 1 stated that:

What we need to avoid at all costs is greenwashing. So, we will never put up targets that we do not understand and that we not to a certain extent can fulfil. [...] So, we are on the learning curve that eventually we will be comfortable putting these targets out there in the marketplace. (Participant 1).

The participants informed that some things are measured when it comes to sustainability, and this was where the ambiguity lied. Participant 1, in the second interview, said that:

What we do and have to do with “Miljøfyrtårn” is to register how many of them [the suppliers] have a certificate like “Miljøfyrtårn”. That is one indicator. Another one is how many of the suppliers’ products hold an environmental certificate. (Participant 1.2).

Participant 2 said that “We gradually have a number of KPIs. We measure the number of registered deviations that have been reported and then we make action plans based on the deviations [...]. It is about both quality, HR and sustainability”, and could also inform that “We have KPIs for injuries and absence”.

The findings for KPIs can be summarized as: *The most important KPIs in Mestergruppen are the financial. There is an ambiguity about sustainability KPIs in the organization, but Mestergruppen do not have any specific KPIs for sustainability today.*

5.4.3 Finding 9: Reporting

The participants all mentioned reporting as a crucial tool, and that sustainability reporting will be an important part of Mestergruppen within a few years. Participant 1 stated, when being asked about sustainability reporting in the organization, that “No, we don’t report”, but continued explaining that:

There are zero requirements as I know, but with “Åpenhetsloven” we have to do due diligence assessments next year or the year after. Then requirements will change [...] it is a rush to understand what you need to report on. (Participant 1).

Participant 2 also mentioned this when being asked about external sustainability reporting “We do not report per today”, but explained that “We, in Mestergruppen, have a very hard-hitting reporting regime [internally], we report on most things”. Potential barriers for reporting were also mentioned by Participant 2:

There are no barriers [...] reporting dollars and cents are much easier than reporting on sustainability. So, then we have to be specific, the number of kilowatts and the number of kilos of CO₂. However, we haven’t good enough data capture to report on that level. (Participant 2).

Regarding the “Miljøfyrtårn” certification, Participant 3 talked about their reporting: “We monitor and report our use of energy, how much waste we produce, how we deal with the waste, our use of fuel, means of transport, for instance, how many flights miles per year per employee, etc”. The participant continued explaining that “Miljøfyrtårn” helps Mestergruppen to calculate and report emissions (Quote by Participant 3 cited in section 5.1.1). “Miljøfyrtårn” was also mentioned in the second interview with Participant 1 when talking about potential reporting systems:

We have applied for membership in U.N. Global Compact. That is the starting point, because then we have to report not only on climate, but on work-life, anti-corruption and human rights [...]. So, to do that, we need a reporting system. We are evaluating which reporting system to use. We can use “Miljøfyrtårn” and add other parameters or other indicators there, but we haven’t gotten that far. (Participant 1.2).

The quotes above leads to the finding for reporting: *Internally, Mestergruppen report on sustainability to a certain degree, but externally they do not report on sustainability yet.*

5.5 Interactive Control System

The finding for the interactive control system includes the interaction between employees, managers and suppliers and the opportunity to innovate. The finding highlights the focus on crucial information and which people that make decisions regarding sustainability.

5.5.1 Finding 10: Interactive communication

It became clear from the interviews, that communication happens in several ways and that Mestergruppen is working on including everyone. Participant 1 informed that “Number one communicating platform is “Workplace”, the second is “Microsoft Teams” and the third is emails. So that is used to share information”. Furthermore, Participant 3 explained how the communication is in the different departments in Mestergruppen:

[...] I think it varies between departments [...] some departments have a more, how can I put it, strict leadership than others. And that naturally influence the team members. The leaders of the departments are the ones in charge, more or less, and they discuss internally and make decisions. (Participant 3).

In addition, Participant 3 talked about a project they are working with:

Now we focus on cooperation and synergies internally to a much higher degree [...]. For instance, we have now gathered the expertise within construction technology, and united them in one group. In that way, the expertise is exploited across companies internally [...]. And not just do we get the expertise spread out throughout the companies, but the resources also love the change. They suddenly don't feel alone in their area of expertise, but they actually have a team of colleagues that they can discuss with and come up with ideas that everyone will take advantage of. (Participant 3).

Participant 2 could inform about challenges regarding inclusion:

How we facilitate innovation? I feel that everyone who has a good idea is heard, but then we had an employee survey this September which showed that not everyone felt heard. That is a challenge, because reality may not be as we see it. But at least we try to listen to the people and include them in consultation. (Participant 2).

Further, Participant 2 explained how they proceed if there is an idea:

An idea that comes from the “floor” is taken with the head of department, the head of department will further take it with his manager and finally it comes up to the management group in the subsidiary, so I feel that there is involvement. If it is a decision or a proposal that comes from the management team, then it will be the same way back down. (Participant 2).

Participant 1 also elaborated on innovation and who is taking part in it:

Innovation or idea exchange, that happens mostly in physical meetings, team meetings, team chats, email dialogues and meetings with suppliers. We are a strong believer in open innovation, so we work with academia a lot, or entrepreneurs (those who build the houses) and consultants all the time. [...] so, innovation happens on a lot of platforms. But for real product innovation, you have to go into house-projects, new house design, new methods of transport, chain evaluation. And that happens with consultants, with selected members, from the retail chains and so forth [...] it [innovation] happens in all divisions or departments, on a mid-management level maybe. (Participant 1).

Furthermore, Participant 2 explained how they usually communicate and discuss innovation in the organization: “We have many areas for meetings where we discuss innovation, but usually we discuss face-to-face. We have our own development department that leads innovation in daily life”.

When it comes to sustainability, the participants agree that everyone is welcome to come with ideas, but the decisions are mostly taken by a smaller group of managers that work directly with sustainability. Participant 1 gave an example:

Just a month ago we had a new opportunity to join a program for circularity to evaluate and use software which costs 200 000 NOK. That is nothing. But still, we need to discuss it in the division management team to say: “Is this something we need to spend resources on? Do we want to, do we have to?” and so forth. (Participant 1).

Participant 3 talked about this smaller group of managers and said:

We’ve had physical meetings, workshops [...] and of course, face to face discussions as well. So, a mix of everything [...]. Lars-Fredrik Forberg developed an Excel sheet where there is a lot of ideas of future projects or areas of improvement, etc. So at least everyone in the group is free to comment and come up with ideas in that sheet. (Participant 3).

Participant 3 continued by saying “If anyone wishes to involve in sustainability, of course we’re open”, and “He [the CEO] encourages questions, and for people to come up with ideas if they wish to”. Participant 3 could also inform that even though one group take most decisions everyone is included in one way or another:

We are also automatically involved in sustainability in every department because of the projects and for those not directly involved, we recently had a teamwork session at the office where everyone was participating in weighing the waste, in collaboration with the cleaning personnel, and removing waste laying around the building [...] in some way I think everyone involves in the sustainability. (Participant 3).

In addition, participant 2 explained how everyone can contribute with ideas regarding sustainability:

We encourage everyone and have many forums where we address the subjects of sustainability, health, environment, safety, etc. We have something called «five minutes» once a week where all employees go through a topic. For instance, one week a topic can be sustainability, the next week it can be HSE and the next week it can be quality. [...] This works well since you get good ideas after those five minutes. (Participant 2).

Regarding this, Participant 1 mentioned some concrete actions to implement the SDGs into the whole value chain in the second interview: “You start on the top and create a forum for sustainability and the group management team that meet regularly”.

The quotes mentioned above lead to evidence of the finding for the interactivity in Mestergruppen: *Interactive communication is used for discussion and to give information. Open innovation is encouraged, but when it comes to sustainability, most decisions are taken by a smaller group of managers.*

5.6 Stakeholders

The findings in this section include the importance of different stakeholders and how they impact and are being impacted by Mestergruppen regarding sustainability.

5.6.1 Finding 11: The key stakeholders

The participants all mentioned the shareholders and their importance in Mestergruppen. There was an agreement that satisfying shareholders is crucial, but the owner's focus on sustainability was also pointed out as an important aspect. When we asked if the participants could mention the key stakeholders, Participant 3 stated that: "This is my personal guess, but probably the shareholders, the board and the members" and continued by adding: "They [the shareholders] are naturally important, as in any other company". In addition, Participant 1 informed about the role of the main owner regarding sustainability:

But we also have a demanding owner, Ferd. Johan Andreessen is known to put sustainability on top of the agenda and is in the forefront of social entrepreneurship in the world [...] we have owners that push the sustainability agenda into the boardroom. (Participant 1).

Furthermore, Participant 3 mentioned the owner's focus:

They [Ferd] focus on ethics and have historically influenced Mestergruppen. And they are also focused on sustainable value creation for the society and the environment. So, in that sense, Ferd has a positive influence on Mestergruppen. Our focus on sustainability is also highly influenced by other key stakeholders, for example our customers. Having a product or service that provides value to your customers is no longer sufficient. We experience that the customers are more concerned about sustainability, and for our success, it is crucial that we satisfy the customers' expectations. (Participant 3).

Even though they are important, the shareholders are not the most important stakeholder in multiple participants' opinion. Regarding this, Participant 2 stated that "I do not think the shareholders are that important. It is the customer that is important" and continued by saying "The raw material suppliers they are there. But the customers are not always there, they are the ones that are important for us to serve and make happy". Participant 1 also explained that "So, shareholders, it is an important stakeholder, but not the most important, I'd say" and informed that:

In order to reduce costs and building time the entrepreneur is the key stakeholder. The factories are another one, and the logistics companies and the retail stores. Those are the external and internal stakeholders that are key, and maybe the architect. (Participant 1).

Regarding sustainability, Participant 3 said “I think everyone [stakeholders] is equally important, as far as I can tell” while Participant 1 elaborated:

To close the loop, to have recycling, you have to reinvent housing. So, we have started an initiative to figure out how to pull the house apart and then transport the parts to another site and assemble a new house. And the important stakeholder in this sense is the private developer, the architect, the person who makes the construction system or these reusable buildings.

The finding for key stakeholders can be summarized as: *There are several key stakeholders in Mestergruppen depending on which perspective that is considered. Regarding sustainability the owners, customers, and suppliers are pointed out as important key stakeholders.*

5.6.2 Finding 12: How stakeholders impact and get impacted by sustainability

From the interviews it became clear that Mestergruppen tries to involve the stakeholders to become more sustainable. Participant 2 emphasized why this is important: “If we are going to be the best, or continue to be the best, we have to take sustainability seriously, because our competitors do”. Participant 1 also mentioned the competitors in the second interview: “When you put this [SDG’s] on your homepage, then it changes, and you want to look at the best in the business. It is Brødrene Dahl and Optimera that are our competitors. Their report on sustainability is very good”. A recurring point in the interviews was the effect “Miljøfyrtårn” certification can have on Mestergruppen’s members and suppliers. Participant 1.2 pointed out that “Once you take the decision in group management team it is only a matter of time before all the different companies are enrolled in the “Miljøfyrtårn” program”. Another measure that can impact Mestergruppen’s stakeholders was also explained by Participant 1.2:

We do the climate gas analysis so we can design a house for minimum impact on the environment and then flush it out through the house chains. So that is how we can work with the value chain and all the stakeholders indirectly or directly, because directly [...] we will specify these houses with these climate gas emissions, whereas the members, they

can choose themselves, but we provide a house catalogue for them and the tool to calculate emissions. (Participant 1.2).

Participant 3 explained what Mestergruppen does today to map the stakeholder's sustainability initiatives:

We make certain demands in our framework agreement, and we have questionnaires that all our suppliers mandatory answer to once a year. The questionnaire includes how they dispose waste without harming the environment. Do they recycle? Do they use recycled plastic or other recycled products or waste? Do their products have an EPD number? [...] And also, is the supplier certified through "Miljøfyrtårn", ISO 14001 or similar. If not, when do they expect to be certified? Is the supplier trying to minimize output of CO₂? If so, in what way do they fill their trucks, are they fully loaded and maybe use euro six technology to reduce emissions of nitrogen oxide? It's not allowed to add micro plastic in the products, and we require that the supplier is a member of an approved company for waste disposal, for instance, "Retura". (Participant 3).

One of the challenges Mestergruppen is facing today is the indirect CO₂ emissions from suppliers or entrepreneurs they do not own. Participant 1.2 informed that:

Now, these [electricians, plumbers etc.] work with sustainability in their own companies and some of them are "Miljøfyrtårn", but we do not control them to a certain extent [...]. These are external stakeholders that do or do not work with sustainability, we have no way of actually capturing that information [...]. So, the entrepreneur, who is not owned by Mestergruppen, will contact his local electrician, and say: I need you to install this ventilation aggregate inside the house [...], that's the end of the discussion. There's a price, but maybe no information about the CO₂ emissions of this hardware, whereas Mestergruppen Eiendom and the houses we make and design ourselves, we can control 100 percent [...]. There are two roads to market here, one where we control the emissions and the other one when we don't. (Participant 1.2).

To handle this challenges Participant 1 explained that:

[...] we invite them to our program ["Miljøfyrtårn"], and if you want to join "Miljøfyrtårn" this is the package, this is the concept, here is the training, and this is what you have to pay. It's served very easily to our franchise members. (Participant 1).

It is also pointed out that more stakeholders, especially end users, are concerned with sustainability and that this is important to take into consideration. Participant 3 emphasized that:

The end users are more focused on sustainability than ever, and we are basically a sales organization. I mean, we need to sell houses before we build them [...] the end user might also be a public company, and the government is highly focused on environment, which in turn demands us to fulfil certain sustainability criteria in order to be a preferred partner. (Participant 3).

Participant 3 also pointed out that “We have members who daily face the requirements of customers and that in turn makes it important to focus on sustainability for our shareholders [...]”. When explaining how CO₂ calculations can contribute to the sales information of a house, Participant 1 stated that “when you put CO₂ up against money [...] it becomes interesting to the end customer and it will then affect all this we made in the design phase in the producing phase, procurement phase, buildings phase and so forth”.

The quotes above gives support to the finding for how stakeholders impact and get impacted by sustainability: *Mestergruppen has started to implement sustainability into the agenda for the suppliers it owns but cannot do this for suppliers it does not own and control directly.*

5.7 Summary of the findings

Themes	Findings
Sustainability	<ol style="list-style-type: none"> 1. Mestergruppen has a good awareness of the situation today regarding sustainability. They are aware of the challenges, their responsibility, and what actions they need to take in the future. 2. Regarding the TBL, “Profit” and “People” are more prioritized in Mestergruppen than “Planet” since this is a new focus area in the organization
Belief system	<ol style="list-style-type: none"> 3. The impact and importance of the values are perceived differently between the managers and director, and sustainability is so far not fully implemented into Mestergruppen’s values. 4. Mestergruppen has a new vision that greatly focuses on sustainability, and it is communicated out to all employees and members.

Boundary system	<p>5. The building industry has a lot of regulations and Mestergruppen's internal rules and regulations are to a great extent following the external ones. In the future there will be more regulations regarding sustainability.</p> <p>6. The ethical guidelines are important and the basis for most decisions taken in Mestergruppen. The guidelines focus on "People" but lack a focus on "Planet".</p>
Diagnostic control system	<p>7. The number of sustainability goals are increasing in line with the focus on sustainability in the construction industry. Mestergruppen's short term plans involve getting its members "Miljøfyrtårn" certified and to start mapping the emissions. The long-term plans are to become more circular and to lower the emissions to reach the goal of climate neutrality.</p> <p>8. The most important KPIs in Mestergruppen are the financial. There is an ambiguity about sustainability KPIs in the organization, but Mestergruppen do not have any specific KPIs for sustainability today.</p> <p>9. Internally, Mestergruppen report on sustainability to a certain degree, but externally they do not report on sustainability yet.</p>
Interactive control system	<p>10. Interactive communication is used for discussion and to give information. Open innovation is encouraged, but when it comes to sustainability, most decisions are taken by a smaller group of managers.</p>
Stakeholders	<p>11. There are several key stakeholders in Mestergruppen depending on which perspective that is considered. Regarding sustainability the owners, customers, and suppliers are pointed out as important key stakeholders.</p> <p>12. Mestergruppen has started to implement sustainability into the agenda for the suppliers it owns but cannot do this for suppliers it does not own and control directly.</p>

Table 3 - Summary of the findings

6. Discussion

We will, in Chapter 6, discuss the findings from the previous chapter in light of the theory presented in Chapter 2, and the aim is to answer our research question which is: *What is the role of sustainability indicators and how do they impact decision-making and control in an organization?* The areas decision-making and control create the structure of the discussion. In section 6.1 and 6.2 we will discuss how sustainability indicators impact these two areas respectively. Within each area, relevant findings from the results will be discussed in relation to the literature and theories. Section 6.3 will give a summary of the main findings from the discussion and present the updated conceptual framework.

6.1 Decision-making

Decision-making is the first area and involves Mestergruppen making sustainable decisions based on sustainability indicators. The indicators can give direction for employees towards important focus areas and is a tool to reach goals (Simons, 1995b, p. 59). Several theoretical frameworks can be applied to the discussion of decision-making and the impact from sustainability indicators. We will use Simons' (1995b) LoC framework, Stakeholder Theory, and the literature on the concept of corporate sustainability and sustainability indicators to discuss it.

According to Briguglio (2003), one main function of the indicators is to support decision-making. In Finding 8 it is pointed out that Mestergruppen does not have any sustainability indicators today and the organization can therefore not use this as a tool to support sustainable decision-making. The diagnostic lever requires pre-determined standards based on critical success factors to work optimally (Simons, 1995b, p. 59). The lack of sustainability indicators can therefore reflect a missing diagnostic control system. Developing sustainability indicators based on critical success factors for Mestergruppen can arrange for support of decisions regarding sustainability. In the TERRAVERA (2021, 1:08:08) workshop, Skancke explained that a prerequisite for making better decisions is information that is both better and more complete. In addition, Skancke stated that it is important to gain sustainability information that is, among other things, standardized, and comparable (TERRAVERA, 2021, 1:10:02). Developing standardized and comparable sustainability indicators can therefore help to

contribute with better and more complete information and hence support sustainable decisions in Mestergruppen.

An organization can achieve long-term corporate sustainability by managing both its natural, social, and economic capital (Dyllick & Hockerts, 2002). In relation to Finding 8, it is reflected in Finding 2 that “Planet” is less prioritized than “Profit” and “People”. Finding 2 might explain the occurrence of Finding 8 as Mestergruppen focuses more on the other aspects and because the most important KPIs are the financial ones. This can for instance have implications for Mestergruppen’s decisions-making regarding sustainability challenges since the organization has more or less no specific targets for this area and therefore lack valuable insights and support from potential sustainability indicators. Based on the TBL theory by Elkington, if an organization aims for sustainability, it is important to perform a TBL where all the three Ps (“Profit”, “People” and “Planet”) are considered (The Economist, 2009). The importance of prioritizing “Planet” in addition to the other aspects to achieve a TBL, was highlighted in a statement by Kenton (2021) where he explained that a focus only on “Profit” might put the organization in a situation where it does not consider all the costs involved of doing business. Based on Finding 2 and 8, it looks like Mestergruppen lacks focus regarding decision-making for the “Planet” aspect and that the costs connected to this aspect therefore are not considered. In relation to this, the garage-configurator and developed sustainability indicators (see Chapter 1 and Appendix 4 for more information) show how Mestergruppen can work systematically with costs associated with the environmental dimension and how they can reach a TBL in the future.

For instance, a sustainability indicator for GWP (Global Warming Potential) can give Mestergruppen valuable insights about how much CO₂ emissions the organization indirectly emits through a supplier in the value chain. By using information from the sustainability indicator in decision-making, Mestergruppen can consider the costs connected to “Planet” for the garage. In addition, Mestergruppen can use this information to make decisions regarding the choice of supplier. Sustainability indicators was also mentioned by Searcy (2009) as a tool to choose between different suppliers. Mestergruppen can also use this information to inform end users about the changes in emissions depending on their choices when designing a garage.

Based on the information from the GWP-indicator Mestergruppen can also compare one type of material with another to make more sustainable decisions. If the sustainability indicator indicates that Industry Standard concrete emits more CO₂ than Low Carbon concrete,

Mestergruppen can use this information to choose the better alternative for the environment. The previous example can also illustrate how the end users' preferences and demands can impact Mestergruppen's decisions. The impact of the end user will, among other things, depend on which information Mestergruppen gives them based on the indicators. If Mestergruppen gives the end users information about price and CO2 emissions (GWP-indicator) when they are designing their garage, it can impact what decisions Mestergruppen needs to make because the end user might choose different materials when they are informed about emissions in addition to price. Mestergruppen might have to decide on other suppliers or materials when the organization sees how the customers are choosing. Finding 7 presents Mestergruppen's long-term goal of becoming climate neutral within 2050 which can, among other things, be done by making more sustainable decisions based on sustainability indicators that, for instance, measure CO2 emissions. If Mestergruppen knows how much CO2 it emits from a particular type of concrete, the organization can make decisions that positively contribute to the "Planet" bottom line by deciding to use one type of concrete over another or work on ways to reduce the emissions from the type that is already used. In that way, sustainability indicators can contribute positively to decision-making for Mestergruppen.

In the interactive control system, one characteristic is that managers on all levels in the organization should focus on and be involved in the strategically important information (Simons, 1995b, p. 97). In Mestergruppen, decisions regarding sustainability are currently made by a smaller group of managers, as pointed out in Finding 10, which may be due to sustainability being a new focus area in the organization. The lack of involvement from all managers regarding important sustainability information can be viewed as a missing interactive control system in Mestergruppen. Involving more managers in decision-making regarding sustainability might benefit Mestergruppen as a whole, because sharing emerging information and a utilization of creativity from all employees in the organization can lead to new ideas (Simons, 1995a). Another characteristic of this lever is the leaders' focus on strategic and important information (Simons, 1995b, p. 97). Finding 2 reflects a lack of complete TBL focus while Finding 1 finds that Mestergruppen has an awareness of its challenges and responsibility. The organization knows, to a certain degree, what decisions regarding sustainability are necessary to make and this can lead the employees towards focusing more on important information about for instance the environment.

In relation to this, Simons (1995b, p. 59) explained how the diagnostic control system focuses on critical success factors by setting standards and that this lever can facilitate for autonomy.

Sustainability indicators can therefore be useful, helping Mestergruppen to prioritize important information when making decisions regarding sustainability. Having direct targets (KPIs) for sustainability might help in delegating responsibility and decision-making down in Mestergruppen. The indicators define some limits, but within these, there is room for individual choices.

In relation to the belief system, Simons (1995b, pp. 33-38) pointed out that to succeed, managers' actions must be in line with the values and purpose of the organization, so they set a good example for the rest of the employees. Finding 3 states indirectly that there is an unclear link between decisions and the values in Mestergruppen, and that sustainability is not fully implemented into the values. Not having a formal belief system in a big organization can lead to unclear and inconsistent understandings of the values and the importance of having them (Simons, 1995a). The lack of a clear link between the values and the decisions made in Mestergruppen might be the result of a weak belief system. Nevertheless, Finding 6 express that the ethical guidelines are the foundation for most decisions made in Mestergruppen. Mestergruppen's ethical guidelines are principles of responsible and ethical business practice and applies to all employees and board members (Mestergruppen, n.d.g). The ethical guidelines can be placed in the boundary system, and according to Simons (1995b, pp. 39-40) this system has a negative focus which means they strict the employees to act a certain way. On the other hand, the belief system has a positive focus and has a purpose to motivate and inspire the employees to maintain or change their behavior (Simons, 1995b, p. 36). The ethical guidelines can therefore be used as a supplement to the values but cannot replace them, hence, some aspects are lacking in order for Mestergruppen to succeed with the belief system (Simons, 1995a). In a situation where the core values are communicated unsuccessfully, the employees can be forced to make assumptions regarding acceptable behavior in different and unpredictable circumstances (Simons, 1995a). Sustainability indicators can be a tool to strengthen the link between decisions and the values in addition to help put sustainability on the agenda since indicators have a supportive function for decision-making, but a prerequisite for strengthening this link is that sustainability is already connected to the values (Briguglio, 2003). Finding 4 identifies Mestergruppen's new vision which is to change the construction industry. The vision is communicated to the employees and members in Mestergruppen. The awareness of sustainability in Mestergruppen, pointed out in Finding 1 and their new vision, which is connected to sustainability, pointed out in finding 4, indicate that Mestergruppen is ready for a change. The new vision is being communicated by the CEO on meetings which is

in line with the belief system (Simons, 1995b, p. 37). Despite this new vision, the strength of the belief system is lacking because of poorly communicated values. Sustainability indicators might be a supportive tool regarding this issue because the use of them can make it easier to implement sustainability into other areas of the organization as well (Briguglio, 2003).

The short-term plans for Mestergruppen are first and foremost to map CO₂ emissions and get its members “Miljøfyrtårn” certified while the long-term plan is to achieve climate neutrality, among other things, by lowering its emissions and becoming more circular, as found in Finding 7. If Mestergruppen is going to achieve long-term corporate sustainability it is important to manage the natural and social capital in addition to economic capital (Dyllick & Hockerts, 2002). Decision-making can be connected to plans as they need to be taken in line with them. Plans can also be connected with indicators as they are both specific and can help organizations to reach targets (Simons, 1995b, p. 179). The diagnostic control system support plans, as the focus is on important success factors to reach goals (Simons, 1995b, p. 59). One can therefore argue that sustainability indicators can be used to link decisions and plans together. Developing sustainability indicators in line with short- and long-term plans can help Mestergruppen to reach the goals that the plans are set out to reach and create a link between decisions and the plans (Simons, 1995b, p. 59). The development of the seventeen SDGs by the UN is an attempt to make a sustainable future for everyone (UN Global Compact, n.d.b). Participant 1 informed that the use of the SDGs is a new area and that they are not fully implemented in Mestergruppen. The organization is currently only focusing on SDG number 13 but is starting to look into other ones, for instance number 12. Since it is necessary to have a link between the goals and plans, the SDGs can be beneficial for Mestergruppen to implement, as they can lead both the goals that are set and the sustainability indicators that are developed in the right direction.

Finding 11 points out that there are several key stakeholders in Mestergruppen and that they can vary depending on the perspective considered. The owners, customers, and suppliers are some of the key stakeholders regarding sustainability in the organization and these are also pointed out by Freeman et al. (2007, p. 50) as primary stakeholders that are necessary to consider when making decisions because they can have a huge impact on the organization's growth and survival. The decisions made in Mestergruppen will, in other words, be impacted by the key stakeholders and it is therefore necessary for Mestergruppen to consider which stakeholders to include in decision-making. A development of sustainability indicators based on the requirements, demands and preferences of the stakeholders might help Mestergruppen

in its work to satisfy these stakeholders because the indicators can support decision-making and give a direction for employees when making decisions regarding sustainability (Briguglio, 2003). The indicators can also contribute with more transparency and credibility of Mestergruppen's sustainability work to the stakeholders.

Finding 9 shows that Mestergruppen does not report on sustainability externally today but increasing demands from stakeholders and more requirements for reporting, especially on the social and environmental dimension of the TBL, can lead Mestergruppen to report on sustainability in the future (Park et al., n.d.). The participants all mentioned that Mestergruppen will start to report on sustainability, but so far, they have not decided on what reporting system to use. In addition, Mestergruppen needs to understand what information is essential to include in the report. Sustainability indicators can, as mentioned, support decision-making and by implementing indicators for sustainability, it can be easier for Mestergruppen to understand what is needed to include in a report and make it easier to decide which information the organization wants to give to the stakeholders (Briguglio, 2003). Participant 1 emphasized that Mestergruppen will never put up a target or KPI that they do not understand because it is important to avoid greenwashing when reporting on sustainability. The increasing demand from the stakeholders regarding information about an organization's sustainability situation and the pressure to report but not to contribute to greenwashing, can create a dilemma for Mestergruppen (Park et al., n.d.). A prerequisite to avoid greenwashing is to take good decisions regarding which sustainability indicators Mestergruppen wants to use both internally and externally.

6.1.1 Main findings: Decision-making

Making sustainable decisions are challenges Mestergruppen is facing to some extent due to the missing focus on "Planet" in the TBL. The integration of the belief system is lacking in the organization, and this can lead to employees creating their own interpretations and therefore making poor decisions. There is also a missing presence of the interactive control system in Mestergruppen since sustainability is a new area and decisions are being made by a smaller group. The boundary system is well integrated and most decisions in Mestergruppen are based on the ethical guidelines. Since the organization does not have sustainability indicators, the diagnostic lever is not strongly implemented when it comes to sustainability which can have implications for decision-making. In addition, Mestergruppen's decisions are being influenced by the key stakeholders. An implementation of sustainability indicators in

Mestergruppen can create opportunities to improve the sustainability situation by making better decisions. The indicators can facilitate for more focus on “Planet”, be used as a supporting tool in decision-making and implementing sustainability into the values, connect the values to the decisions, facilitate direction and limits so more employees can be included in decisions and contribute to satisfy key stakeholders.

6.2 Control

Control is important in an organization to manage it successfully and the LoC framework explains aspects that must be in place for managers to gain control (Simons, 1995a). In the following discussion, the boundary and diagnostic lever will be used to look closer at the impact sustainability indicators can have on control since methods of control are placed here (de Haan-Hoek et al., 2020). Literature on SSCM and sustainability indicators will also be used to explore how indicators can contribute to control.

In Mestergruppen the rules and guidelines are important and need to be followed, as found in Finding 5 and 6. The ethical guidelines were mentioned by several participants as an important tool they use, both to control and guide employee behavior, and to guide members and their actions. Simons (1995a) pointed out the importance of having a boundary system with a minimum standard for activities that are not allowed, and that this can lead to innovation and ideas within set boundaries. Rules and guidelines are a way of achieving this, and the boundary lever is strongly implemented and used in Mestergruppen based on Finding 5 and 6.

Finding 6 illustrates the role the ethical guidelines have in Mestergruppen while Finding 2 points out the missing focus on “Planet” in the organization. The ethical guidelines are good at incorporating “People” but do so far lack the inclusion of “Planet”. Dyllick and Hockerts (2002) stressed the problem with this and informed that organizations that do not include all three dimensions will only experience short term success. Since the ethical guidelines permeates most actions in Mestergruppen, as found in Finding 6, the implementation of sustainability in these will have the potential to significantly improve the TBL for both Mestergruppen and its members (Dyllick & Hockerts, 2002). In order for Mestergruppen to control every aspect of the TBL, it is important that all the dimensions are included, and the focus on the environmental dimension is therefore necessary. De Haan-Hoek et al. (2020) pointed out that the dimensions can be more controllable and measurable by further dividing them. Sustainability indicators can contribute to the control and measuring because they can

set standards and be a monitoring tool for managers (Briguglio, 2003). One of the motivating factors for making sustainability indicators is the evolution of regulations within sustainability (Park et al., n.d.). By creating sustainability indicators that are in line with existing and evolving rules and guidelines in Mestergruppen, the work towards these indicators will automatically be within the boundaries of the organization.

The participants mentioned that Mestergruppen does not have KPIs for sustainability today, as stated in Finding 8. Since the organization lacks indicators, it is difficult to control the work regarding sustainability, both within the organization and in the value chain. KPIs can be used to monitor behavior, but if Mestergruppen does not have targets on its sustainability performance, it will be difficult to control it (Simons, 1995b, p. 59). The participants also informed about the complexity of Mestergruppen's value chain, and this creates a challenge for the organization. While Finding 12 finds that Mestergruppen has started to implement sustainability on the agenda for the suppliers, this only apply for the suppliers that Mestergruppen own. The organization cannot control other suppliers in the value chain and their work towards sustainability directly. This challenge is also pointed out by de Haan-Hoek et al. (2020) who stated that larger companies often have control over their "first-tier suppliers" but that the control further upstream often is lacking. This is also true for Mestergruppen, as mentioned by Participant 1.2 through the example of entrepreneurs who hires their own electricians. A development and use of sustainability indicators can give Mestergruppen more control over its suppliers because the indicators can be used as targets that the suppliers work towards and Mestergruppen can more easily monitor this (Simons, 1995b, p. 59). In order for Mestergruppen to use sustainability indicators to monitor suppliers it is necessary to alter the management. De Haan-Hoek et al. (2020) finds that the LoC framework can be used as a control system to influence the supply chain by altering it from an employee-focus to a focus on how suppliers are influenced. If Mestergruppen succeeds with this, sustainability indicators can be used as a "checklist" to control if suppliers focus on the right aspects, for instance if they are in line with the ethical guidelines (Searcy, 2009).

Searcy (2009) informed that organizations increasingly are considering issues in the supply chain as part of their own sustainability work. This is because organizations to a larger degree are held responsible for the suppliers' sustainability challenges and because much of the corporate value is created at supplier level. De Haan-Hoek et al. (2020) also emphasized that larger organizations, typical chain directors, have a responsibility to focus on all three dimensions of the TBL because this is expected by the stakeholders. Since Mestergruppen is

Norway's biggest housing manufacturer and one of the biggest groups for building material trade in Scandinavia, they can be viewed as a chain director in the supply chain and does therefore need to take responsibility regarding sustainability (Mestergruppen, n.d.a). Mestergruppen has begun taking this responsibility, for instance by mapping its CO₂ emissions to understand both the direct and indirect emissions in the value chain. The organization is aware of its challenges, as found in Finding 1, and has therefore good prerequisites for taking the necessary responsibility and later gain control over the emissions. In relation to this, sustainability indicators can contribute to better control. Mestergruppen can for instance create indicators for direct and indirect emissions in the value chain to monitor how the organization performs both internally and in the whole value chain.

Organizations are increasingly starting to report on sustainability due to a growing sustainability focus among stakeholders (Park et al., n.d.). Despite this, Finding 9 finds that Mestergruppen only report on sustainability internally today. Sustainability reporting can increase the need for control, both in the drafting stage of the report, and after the report is finished. When drafting the sustainability report, it can be necessary to have control over what to include. After the publication of the report, it is necessary to control that Mestergruppen's performance is in line with the report to avoid greenwashing. This is important because stakeholders can use information from the report to get an overview of Mestergruppen's sustainability work (Park et al., n.d.). Customers can use the report to consider if they want to buy from Mestergruppen and shareholders can evaluate if they want to invest in the organization. Customers and shareholders (Financiers) are some of the primary stakeholders according to Freeman et al. (2007, p. 50), and they are important for the growth and survival of an organization. It is therefore important that these stakeholders are satisfied with the report for Mestergruppen to succeed (de Haan-Hoek et al., 2020). Control of the reporting can be done by an implementation of sustainability indicators. One of the motivating factors for developing sustainability indicators is the expected requirements for sustainability reporting in the future, and sustainability indicators should therefore be implemented and used in reporting for Mestergruppen when the organization starts to report externally (Park et al., n.d.). As mentioned, indicators can contribute to monitor developments and set targets, and can therefore be useful to include in a report to make it easier for employees to work towards the targets, and in line with the report, but also to make it easier for managers to control (Dyllick & Hockerts, 2002; Simons, 1995b, p. 59).

6.2.1 Main findings: Control

Controlling sustainability in the value chain is a challenge that Mestergruppen is facing since the value chain is complex and the organization does not control all its suppliers. As a chain director, Mestergruppen is still expected to take responsibility, and the use of sustainability indicators can contribute to this by giving targets to control against. The boundary system is well rooted in the organization and contributes to control by having well established ethical guidelines that apply for both the employees and members. The ethical guidelines include “Planet” only to a small degree and can therefore not contribute to control within this aspect yet. The diagnostic control system is not particularly implemented in Mestergruppen regarding sustainability, among other things, because the control system does not include sustainability indicators. Therefore, this system cannot fully control for sustainability.

6.3 Summary and conceptual framework

Section 6.3.1 contains a summary of the findings from the discussion that we deemed to be most critical for Mestergruppen to consider. Section 6.3.2 presents an updated version of the conceptual framework presented in section 2.5, where the findings from the discussion are included.

6.3.1 Summary of the main findings

We will in this section summarize the main findings and attempt to combine the discussion of decision-making and control. We view some of the findings to be more important than others for Mestergruppen to consider in an attempt of becoming more sustainable. Finding 1 illustrates the awareness Mestergruppen has regarding sustainability, and it is pointed out by Participant 1 that they so far only to a small degree use the SDGs as a guideline and inspiration when planning their own sustainability work. The discussion around Finding 2 is important because it is critical that Mestergruppen includes all aspects of the TBL if the organization wants to achieve long-term corporate sustainability and this finding impacts all aspects of the management. It is essential to create a better link between Mestergruppen’s values and the decisions being made, as discussed in relation to Finding 3, both in general, and regarding sustainability because Mestergruppen should use the values as a foundation for all its work. From Finding 6 we have discussed the impact the ethical guidelines have in Mestergruppen, both on decision-making and control and we have seen how an implementation of

sustainability indicators can help Mestergruppen to better control and make decisions regarding “Planet”. An important finding is Finding 8 which pointed out the lack of sustainability indicators. Through the discussion it becomes clear that sustainability indicators can be used in many ways to make Mestergruppen more sustainable, and we have also tried to contribute to Mestergruppen’s sustainability work by developing sustainability indicators for the garage-configurator (Appendix 4). Finding 10 finds that decisions regarding sustainability are not involved by all managers in Mestergruppen. Sustainability indicators can contribute to include more managers in decisions so more ideas are expressed and can be utilized because of the room for autonomy they give. The last important finding is Finding 12 which points out that Mestergruppen has started to implement sustainability in the value chain, but the discussion finds that the organization is faced with a challenge regarding the implementation of sustainability for suppliers it does not own and therefore not control.

What becomes clear from the discussion is that decisions need to be made all the time in Mestergruppen. Since Mestergruppen wants to implement sustainability into the organization, the managers need to make decisions about what they want to focus on, how they want to implement sustainability and when, and decide who should have the responsibility for sustainability. We have discussed how sustainability indicators can impact the decision-making in Mestergruppen by being a supporting tool, giving direction, setting standards for the decisions that are being made, and pointing out important focus areas.

It also becomes clear that there are many areas that Mestergruppen should or need to control, both within and outside the organization. Sustainability is a relatively new area for Mestergruppen which can lead to a need for control. Mestergruppen can control its employees and members, but for the suppliers Mestergruppen does not own, there is a challenge regarding how the organization can control these suppliers to become more sustainable. Also here, we have discussed the impact sustainability indicators can have. We have discussed how sustainability indicators can support control by being a target employees work towards. The targets can further be monitored and controlled by managers. Sustainability indicators can also support control by being implemented in line with rules and regulations and be used to control suppliers if Mestergruppen manages to implement them in the supply chain.

Decision-making and control are closely related in Mestergruppen. Managers need to control the decisions that are being made to make sure that they are in line with for instance the rules, guidelines, goals, and plans. Mestergruppen can also control in advance if a decision should

be made, not just monitor them afterwards. Sustainability indicators can contribute to this relation. If decisions are being made in line with the indicators, then managers might not have to control this.

6.3.2 Updated conceptual framework

In this section we present an updated version of the conceptual framework from section 2.5 that was developed based on the theory chosen to explore the study's research question. The adjustments of the framework are based on the findings from Chapter 5, and main findings from the discussion in Chapter 6. The updated conceptual framework illustrates how MCS, Sustainability goals and Stakeholders influence each other in addition to how the impact is between the four levers in Mestergruppen. The purpose of the extended framework is to highlight how the situation is for Mestergruppen today, both inside and outside the organization regarding the main challenges for the management, decision-making, and control. Mestergruppen can use this framework to get an overview over which improvements that should be done to facilitate for sustainability in the future. An illustration of the conceptual framework is shown in Figure 5.

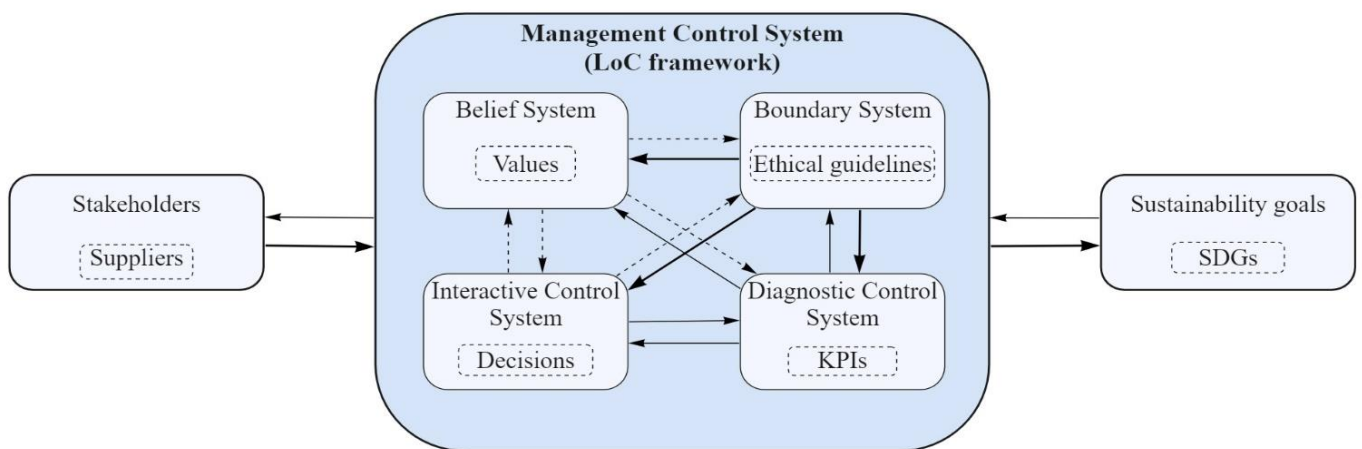


Figure 5 - Updated conceptual framework

Figure 5 shows an inclusion of all the boxes from the original framework in section 2.5 which are *Stakeholders*, *MCS (including boxes for the four levers)* and *Sustainability goals*. The adjustments that are made are the new arrows placed between the different boxes, which represent the impact the boxes have on each other. The relationships are shown through the arrows, pointing in different directions and through the thickness of the arrows which represents the level of impact the box has. The framework is based on three levels of impact (large, medium, and small degree of impact), the thicker the line is, the more impact the box

has. For instance, a box has little impact on another box if the arrow is dotted. The key challenges are highlighted with an extra dotted box within the main box and are based on the summary of the discussion.

We have limited the framework to only include one challenge in each main box, which are as follows: Suppliers, SDGs, Values, Decisions, Ethical guidelines and KPIs. The first two challenges are included in the boxes *Stakeholders* and *Sustainability goals* respectively. Mestergruppen has a complex supply chain and since it does not own every supplier in the chain, it is difficult to control what actions they do regarding sustainability. In addition, Mestergruppen uses the SDGs only in a small degree as an inspiration when designing its own sustainability goals. The last four challenges are included in the *MCS* box, more specifically in the boxes of the four levers. For the *belief system*, the key challenge involves the core values of Mestergruppen which are not fully communicated, and this can have further implications for how the employees make decisions regarding sustainability in the organization. The key challenge for the *interactive control system* is the lack of involvement of managers when making sustainability decisions. The *boundary system* has a key challenge in relation to the ethical guidelines because of the missing inclusion of the environmental dimension even though these guidelines are otherwise well established in the organization. The last key challenge for Mestergruppen is included in the *diagnostic control system* and is the fact that the organization lacks sustainability KPIs.

The framework is made to explore the research question which involves the role of the sustainability indicators and how they impact the two chosen areas (decision-making and control). We developed a framework that considers both the stakeholders and sustainability goals in addition to the MCS because the LoC framework does not include these elements. The conceptual framework has a more holistic approach which can make it easier to understand how everything is connected in addition to facilitate for better decisions and control. Also, the framework is based on an idea that making decisions and facilitating for control can be influenced by multiple levers in addition to elements outside the organizations such as stakeholders and SDGs. We have chosen to simplify this model to make it easier to understand by only focusing on the key boxes and challenges. It could be advantageous to include more boxes and challenges within the model to achieve a better overview of the organization's situation, but we wanted to simplify the model to highlight what we think are the most important aspects to prioritize regarding improvements for sustainability. In our view, having a complex model might confuse more than it contributes. For instance, the model does

not include arrows between *Stakeholders* and *Sustainability goals* since we see them only impact each other indirectly through the *MCS*.

Looking at the relationships between the different boxes, there are always arrows going in both directions because, in most cases, both boxes impact each other. Starting with the relationship between *Stakeholders* and *MCS*, the suppliers in Mestergruppen's value chain impact its MCS to a large extent, but Mestergruppen does not impact the suppliers as much since the organization is not in control of every supplier. In the relationship between *Sustainability goals* and *MCS*, the arrows reflect that the SDGs do not impact the MCS of Mestergruppen much since information about them are available for any organization to use, but Mestergruppen can for instance manage which SDGs they want to include in the development of their sustainability goals. Here, the external pressure from the stakeholders can indirectly impact the sustainability goals of Mestergruppen through their MCS. Looking at the relationships within the *MCS*, the *belief system* has a small degree of impact on the other three levers since the core values are poorly communicated and lack consideration of "Planet" which is an important bottom line according to TBL theory. Furthermore, the *interactive control system* has a varying degree of impact depending on which lever that is considered. This system has a small degree of impact on the *belief system* and *boundary system* because the lack of involvement of managers regarding sustainability decisions does not currently impact the core values and ethical guidelines but has a medium impact on the *diagnostic control system* since the missing involvement impact which targets to focus on in the organization to a certain degree. The framework clearly illustrates the importance of the *boundary system* in Mestergruppen as the impact is large on all the other levers. Based on the findings, the ethical guidelines have a huge impact on many aspects, for instance the values, decisions, and the development of different KPIs. Lastly, we have the *diagnostic control system* which has a medium degree of impact on all the other levers, and this is because the different targets (KPIs) can help lead the direction in Mestergruppen.

In general, the framework highlights a missing focus on the environmental dimension in the four levers. Also, the framework shows that, the four levers are not in balance which is not in line with what Simons (2000, p. 301), as cited in Widener (2007, p. 760) said. Therefore, the framework highlights that it might be difficult to achieve a balance in practice, for example if the organization is adapting to new changes.

7. Conclusion

In the last chapter we will finalize our study by first looking at the key findings from Chapter 6 and use these to answer the research question in section 7.1. Afterwards, in section 7.2 we will present the limitations of this study and then give some directions for further research in section 7.3.

7.1 Answering the research question

Since the construction industry stands for more than 15% of Norway's total emissions it is important for the industry to consider new tools and areas to achieve corporate sustainability (Asplan Viak, 2019; UN Global Compact, n.d.b). Sustainability indicators can help an organization to become more sustainable, and at the TERRAVERA event, the urge for developing shared standards to measure sustainability performance, reward good performance and compare the performance with other organizations were highlighted in as important topics (Mickwitz & Melanen, 2009; TERRAVERA, 2021). There is still missing research on sustainability indicators, for instance topics as shared standards, how to design them and what contribution they have (TERRAVERA, 2021, 20:00-26:45). Also, Searcy (2009) points to the need for more research within the field of sustainability indicators and how they are designed and used in an organization. Based on this, the research question in this study is developed as an attempt to contribute with insights regarding the role of sustainability indicators and how they impact decision-making and control in an organization since indicators are one example of many management tools an organization can use to work systematically with sustainability.

The findings of this research show that sustainability indicators can have multiple roles and that the impact the indicators have is different when looking at decision-making and control. Through the study we find that the sustainability indicators can have a supportive and informative role when making sustainability decisions in Mestergruppen. Regarding control, the sustainability indicators can have a monitoring and guiding role. Overall, based on the findings, the roles identified apply to the organization both internally and externally.

In general, sustainability is a relatively new area for Mestergruppen, and this is reflected in our findings. Throughout our study we found that there is an imbalance between the four levers within the MCS which is not in line with what Simons stated (Simons, 2000, p. 301, as cited in Widener, 2007, p. 760). The boundary system has a clear presence in Mestergruppen with

the ethical guidelines laying the foundation for the decisions and control in the organization. The presence is less for the other three levers. The belief system has the least impact on the other levers, while the interactive control system and diagnostic control system impact the other levers to a certain degree. In addition, based on the findings and the extended conceptual framework, we identified six challenges that can be solved by for instance sustainability indicators to achieve better management, control, and decision-making regarding sustainability.

The first challenge identified is the lack of sustainability indicators in Mestergruppen. However, they are currently working with this challenge in collaboration with TERRAVERA through the garage-configurator (see Appendix 4) and these sustainability indicators can be used for both Mestergruppen and the end users. This can reflect that Mestergruppen considers a development of sustainability indicators to be important.

The second challenge pointed out, in relation to the belief system, is the lack of a presence of the core values. This is not in line with what is required by Simons (1995b, p. 34). Sustainability indicators can be a tool to help facilitate a better link between the values and decisions made in Mestergruppen as they can have a supporting role for the decision-making and ensure that decisions are being made in line with both the values and sustainability.

In the interactive control system, the third challenge is identified as a lack of involvement from all managers in sustainability decision-making. This is not in accordance with the interactive control system (Simons, 1995b, p. 97). Therefore, an involvement of more managers is vital because only a well-integrated interactive control system can share emerging information efficiently and harness the creativity of the employees on all organizational levels (Simons, 1995a). Here, sustainability indicators can have a monitoring and guiding role, and they can help lead the employees in the right direction as decisions are being made, and at the same time facilitate for more innovation.

The fourth challenge which is placed in the boundary system is the missing focus on the environmental dimension in the ethical guidelines. Here, TBL is not performed as required by Elkington (Elkington, 1998, as cited in Casey et al., 2014). In relation to this, sustainability indicators can have an informative and a guiding role. Developing sustainability indicators specifically for the environmental dimension, that are in line with rules and regulations, can

facilitate for an inclusion of "Planet" in the ethical guidelines, which again can impact the decisions and control in Mestergruppen positively.

The last two challenges are identified outside the MCS of the organization. One challenge is the fact that Mestergruppen does not own and control all the suppliers in its supply chain. Sustainability indicators can help achieving more control of the suppliers by having a monitoring and guiding role, but this presupposes that Mestergruppen can alter its management from monitoring employees to monitoring suppliers (de Haan-Hoek et al. 2020). The last challenge is the small number of SDGs implemented into Mestergruppen's sustainability goals. Since the SDGs are developed to create a better future, an implementation of more SDGs can lead the organization in a right direction and ensure it to prioritize the most vital sustainability aspects (UN Global Compact, n.d.b). In that sense, sustainability indicators can have both a supportive, informative, and guiding role in Mestergruppen and can facilitate for making sustainable decisions based on the most important information and control the performance of the employees.

The need for sustainability indicators in Mestergruppen may not have been critical up until now, but based on our research, we find it necessary for Mestergruppen to develop good and precise sustainability indicators if the organization wants to succeed in becoming sustainable. Here, the seventeen SDGs can be used as a guideline when developing sustainability indicators. The main finding from our study is that a sustainability indicator can have many roles depending on which challenge it seeks to solve. Based on several important roles, we find that sustainability indicators can have a positive impact on both decision-making and control in Mestergruppen which can make it easier for the organization to reach its main goal of becoming climate-neutral within 2050.

7.2 Limitations

Our study has some limitations. First and foremost, we had a limited timeframe of four months to conduct the research. We limited the research to the construction industry in Norway and further limited the study to only look at one company to get a deeper understanding of the management and impact of sustainability indicators. We only looked at sustainability indicators' impact on decision-making and control to investigate if they could lead to more sustainable decisions and better control. In the development of sustainability indicators for the use-case of a garage-configurator in Mestergruppen, we limited the research to only look at

concrete as a building material used in the garage. The purpose of this limitation was to get a detailed overview of the impact of this material.

7.3 Further research

Based on this research and its limitations, there are several interesting approaches that can be taken for further research. One interesting approach could be to investigate other companies within the construction industry either with a qualitative approach like ours, or a quantitative approach. Since this research is a case study, generalization of the findings cannot be done, and the investigation of other companies would therefore be interesting to see if the same findings occur there.

Further research in relation to the development of sustainability indicators for the garage-configurator would also be very interesting. The limited time led us to only develop sustainability indicators for one building material, but there are more building materials to look at in the future for instance woodwork. There is a need for a development of more sustainability indicators for other materials than concrete to get a better picture of how much the garage emits. In addition, a development of sustainability indicators that target social sustainability is also very interesting and is demanded from both Mestergruppen and the society.

Another suggestion for further research is to conduct a quantitative study on behalf of Mestergruppen, for instance through a questionnaire or survey, where the preferences of the end users are investigated in relation to the garage-configurator. Mestergruppen needs to know what sustainability information the end users desire when buying a garage. For example, do the end users want one total sustainability score based on the size and materials they have chosen in the design-faze, or do they want more specific information about each material in the garage?

References

- Ahi, P., & Searcy, C. (2013). A comparative literature analysis of definitions for green and sustainable supply chain management. *Journal of Cleaner Production*, 52, 329-341. <https://doi.org/10.1016/j.jclepro.2013.02.018>
- Asplan Viak. (2019). *Bygg- og anleggssektorens klimagassutslipp*. Retrieved from https://www.bnl.no/siteassets/dokumenter/rapporter/klimautslipp_bae_2019.pdf
- Briguglio, L. (2003). *The Usefulness of Sustainability Indicators*. Retrieved from <https://www.um.edu.mt/library/oar/bitstream/123456789/18255/1/OA%20-%20THE%20USEFULNESS%20OF%20SUSTAINABILITY%20INDICATORS.pdf>
- Bygg21. (2018). *Bygg- og eiendomssektorens betydning for klimagassutslipp*. Retrieved from https://bygg21.no/wp-content/uploads/2021/03/33019_interaktiv_arb.gr_3_veileder-2.pdf
- Casey, A. M., Cawthorne, J. E., DeLong, K., Herold, I. M., & Lim, A. (2014). The Triple Bottom Line: Portable Applications and Best Practices for Sustainability in Academic Libraries. *Focus on Educating for Sustainability: Toolkit for Academic Libraries*. Library Juice Press.
- Collier, P. M. (2005). Entrepreneurial control and the construction of a relevant accounting. *Management Accounting Research*, 16(3), 321-339. <https://doi.org/10.1016/j.mar.2005.06.007>
- de Haan-Hoek, J., Lambrechts, W., Semeijn, J., & Caniels, M. C. (2020) Levers of Control for Supply Chain Sustainability: Control and Governance Mechanisms in a Cross-Boundary Setting. *Sustainability*, 12(8), 1-22. <https://doi.org/10.3390/su12083189>
- Diesendorf, M. (2000). Sustainability and sustainable development. *Sustainability: The corporate challenge of the 21st century* (p. 19-37). Allen & Unwin.
- Dyllick, T., & Hockerts, K. (2002). Beyond the business case for corporate sustainability. *Business strategy and the environment*, 11(2), 130-141. <https://doi.org/10.1002/bse.323>
- Elkington, J. (1998). *Cannibals with forks: The triple bottom line of 21st century business*. New Society Publishers.
- EPD-Norge. (n.d). *Hva er en EPD?* EPD-Norge. <https://www.epd-norge.no/hva-er-en-epd/>
- European Commission. (n.d). *EU taxonomy for sustainable activities*. European Commission. https://ec.europa.eu/info/business-economy-euro/banking-and-finance/sustainable-finance/eu-taxonomy-sustainable-activities_en#why
- Ferreira, A. (2002). *Management accounting and control systems design and use: an exploratory study in Portugal*. University of Lancaster.

-
- Ferreira, A., & Otley, D. (2009). The design and use of performance management systems: An extended framework for analysis. *Management Accounting Research*, 20(4), 263-282. <https://doi.org/10.1016/j.mar.2009.07.003>
- FN Sambandet. (2020, December 22). *Parisavtalen*. FN Sambandet. <https://www.fn.no/om-fn/avtaler/miljoe-og-klima/parisavtalen>
- Formentini, M. & Taticchi, P. (2016). Corporate sustainability approaches and governance mechanisms in sustainable supply chain management. *Journal of Cleaner Production*, 112, 1920-1933. <https://doi.org/10.1016/j.jclepro.2014.12.072>
- Freeman, R. E., Harrison, J. S., & Wicks, A. C. (2007). *Managing for Stakeholders: Survival, Reputation, and Success*. Yale University Press.
- Freeman, R. E., Harrison, J. S., Wicks, A. C., Parmar, B. L., & de Colle, S. (2010). *Stakeholder Theory: The State of the Art*. Cambridge University Press.
- Friedman, M. (1970, September 13). The Social Responsibility of Business is to Increase its Profits. *The New York Times Magazine*, 1-6.
- Garvare, R., & Johansson, P. (2010). Management for sustainability – A stakeholder theory. *Total quality management*, 21(7), 737-744.
- Gelderman, K., & Albronda, B. (2017). *Professioneel inkopen* (5th ed.). Noordhoff Uitgevers.
- Glavič, P., & Lukman, R. (2007). Review of sustainability terms and their definitions. *Journal of cleaner production*, 15(18), 1875-1885. <https://doi.org/10.1016/j.jclepro.2006.12.006>
- Gond, J. P., Grubnic, S., Herzig, C., & Moon, J. (2012). Configuring management control systems: Theorizing the integration of strategy and sustainability. *Management Accounting Research*, 23(3), 205-223.
- Hanss, D., & Böhm, G. (2012). Sustainability seen from the perspective of consumers. *International Journal of Consumer Studies*, 36(6), 678-687. <https://doi.org/10.1111/j.1470-6431.2011.01045.x>
- Hassini, E., Surti, C., & Searcy, C. (2012). A literature review and a case study of sustainable supply chains with a focus on metrics. *International Journal of Production Economics*, 140(1), 69-82. <https://doi.org/10.1016/j.ijpe.2012.01.042>
- Herriott, R. E., & Firestone, W. A. (1983). Multisite qualitative policy research: Optimizing description and generalizability. *Educational researcher*, 12(2), 14-19.
- Hristov, I., & Chirico, A. (2019). The Role of Sustainability Key Performance Indicators (KPIs) in Implementing Sustainable Strategies. *Sustainability*, 11(20), 1-19.
- Jabareen, Y. (2009). Building a conceptual framework: philosophy, definitions, and procedure. *International journal of qualitative methods*, 8(4), 49-62. <https://doi.org/10.1177/160940690900800406>

-
- Jensen, M. C. (2001). Value Maximisation, Stakeholder Theory, and the Corporate Objective Function. *European Financial Management: the Journal of the European Financial Management Association*, 7(3), 297–317. <https://doi.org/10.1111/1468-036X.00158>
- Johannessen, A., Christoffersen, L., & Tufte, P. A. (2011). *Forskningsmetode for økonomisk-administrative fag* (3rd ed.). Abstrakt forlag.
- Johannessen, A., Christoffersen, L., & Tufte, P. A. (2020). *Forskningsmetode for økonomisk-administrative fag* (4th ed.). Abstrakt forlag.
- Jørgensen, S., & Pedersen, L. J. T. (2018). *RESTART Sustainable Business Model Innovation*. Palgrave Macmillan.
- Kärreman, & Alvesson, M. (2004). Cages in Tandem: Management Control, Social Identity, and Identification in a Knowledge-Intensive Firm. *Organization*, 11(1), 149–175. <https://doi.org/10.1177/1350508404039662>
- Kenton, W. (2021, March 16). *Tripple Bottom Line (TBL)*. Investopedia <https://www.investopedia.com/terms/t/triple-bottom-line.asp>
- Liebetruht, T. (2017). Sustainability in performance measurement and management systems for supply chains. *Procedia engineering*, 192, 539-544.
- Malmi, T., & Brown, D. A. (2008). Management control systems as a package - Opportunities, challenges, and research directions. *Management Accounting Research*, 19(4), 287-300. <https://doi.org/10.1016/j.mar.2008.09.003>
- Mansell, S. F. (2013). A critique of stakeholder theory: the methodology. *Capitalism, Corporations, and the Social Contract: A Critique of Stakeholder Theory* (p. 16-18). Cambridge University Press.
- Martyn, P., Sweeney, B., & Curtis, E. (2016). Strategy and control: 25 years of empirical use of Simons' levers of control framework. *Journal of Accounting & Organizational Change*, 12(3), 281-324. <https://doi.org/10.1108/JAOC-03-2015-0027>
- Mestergruppen. (n.d.a). *Om Mestergruppen*. Mestergruppen. <https://www.mestergruppen.no/om-mestergruppen/>
- Mestergruppen. (n.d.b). *Om Mestergruppen: Bærekraft*. Mestergruppen. <https://www.mestergruppen.no/om-mestergruppen/baerekraft/>
- Mestergruppen. (n.d.c). *Om Mestergruppen: Historie*. Mestergruppen. <https://www.mestergruppen.no/om-mestergruppen/historie/>
- Mestergruppen. (n.d.d). *Om Mestergruppen: Ledelsen*. Mestergruppen. <https://www.mestergruppen.no/om-mestergruppen/ledelsen/#1>
- Mestergruppen. (n.d.e). *Om Mestergruppen: Styret*. Mestergruppen. <https://www.mestergruppen.no/om-mestergruppen/styret/#1>
- Mestergruppen. (n.d.f). *Om Mestergruppen: Våre verdier*. Mestergruppen. <https://www.mestergruppen.no/om-mestergruppen/vaare-verdier/>

- Mestergruppen. (n.d.g). *Om Mestergruppen: Våre verdier - Her finner du våre etiske retningslinjer*. Mestergruppen. <https://www.mestergruppen.no/media/1430/etiske-retningslinjer-v-oppstart.pdf>
- Mickwitz, P., & Melanen, M. (2009). The role of co-operation between academia and policymakers for the development and use of sustainability indicators—a case from the Finnish Kymenlaakso Region. *Journal of Cleaner Production*, 17(12), 1086-1100. <https://doi.org/10.1016/j.jclepro.2008.12.003>
- Miljøfyrtårn. (n.d). *Om oss: Dette er miljøfyrtårn*. Miljøfyrtårn. <https://www.miljofyrtarn.no/virksomhet/om-oss/dette-er-miljofyrtarn/>
- Mirick, R. G., & Wladkowski, S. P. (2019). Skype in Qualitative Interviews: Participant and Researcher Perspectives. *The Qualitative Report*, 24(12), 3061-3072. <https://www.proquest.com/scholarly-journals/skype-qualitative-interviews-participant/docview/2331238835/se-2>
- Mundy, J. (2010). Creating dynamic tensions through a balanced use of management control systems. *Accounting, Organizations and Society*, 35(5), 499-523. <https://doi.org/10.1016/j.aos.2009.10.005>
- NTB. (2021, September 17). FNs generalsekretær: Verden er på vei mot 2,7 graders oppvarming. *E24*.
- Park, C., Whittier, R., & McElroy, M. (n.d). *CFO insights: Sustainability: developing key performance indicators*. Deloitte. <https://www2.deloitte.com/content/dam/Deloitte/cn/Documents/finance/deloitte-cn-cfo-insights-sustainability-developing-key-performance-indicators-en-201206.pdf>
- Saunders, M. N. K., Lewis, P., & Thornhill, A. (2019). *Research methods for business students* (8th ed.). Pearson.
- Searcy, C. (2009). *The role of sustainable development indicators in corporate decision-making*. International Institute for Sustainable Development. https://www.iisd.org/system/files/publications/role_of_sustainability_indicators.pdf
- Simons, R. (1987). Accounting control systems and business strategy: An empirical analysis. *Accounting, Organizations and Society*, 12(4), 357-374. [https://doi.org/10.1016/0361-3682\(87\)90024-9](https://doi.org/10.1016/0361-3682(87)90024-9)
- Simons, R. (1990). The role of management control systems in creating competitive advantage: New perspectives. *Accounting, Organizations and Society* 15(1-2), 127-143. [https://doi.org/10.1016/0361-3682\(90\)90018-P](https://doi.org/10.1016/0361-3682(90)90018-P)
- Simons, R. (1991). Strategic orientation and top management attention to control systems. *Strategic Management Journal*, 12(1), 49-62. <https://doi.org/10.1002/smj.4250120105>
- Simons, R. (1994). How new top managers use control systems as levers of strategic renewal. *Strategic Management Journal*, 15(3), 169-189. <https://doi.org/10.1002/smj.4250150301>

-
- Simons, R. (1995a). Control in an Age of Empowerment. *Harvard Business Review*, 73(2), 80-88.
- Simons, R. (1995b). *Levers of Control: How Managers Use Innovative Control Systems to Drive Strategic Renewal*. Harvard Business School Press.
- Simons, R., Dévila, A., & Kaplan, R. S. (2000). *Performance Measurement and Control Systems for Implementing Strategy: Text and Cases*. Prentice-Hall.
- Spiliakos, A. (2018, October 10). What does "sustainability" mean in business?. Harvard Business School. <https://online.hbs.edu/blog/post/what-is-sustainability-in-business>
- SSB. (2021, November 8). *Produksjonsindeks for bygge- og anleggsvirksomhet*. Statistisk sentralbyrå. <https://www.ssb.no/bygg-bolig-og-eiendom/bygg-og-anlegg/statistikk/produksjonsindeks-for-bygge-og-anleggsvirksomhet>
- Sustainability Illustrated. (2014, April 8). *Triple bottom line (3 pillars): sustainability in business* [Video]. YouTube. <https://www.youtube.com/watch?v=2f5m-jBf81Q>
- TERRAVERA. (2021, September 1). *NTNU x TERRAVERA Mobilisering* [Video]. YouTube. <https://www.youtube.com/watch?v=fE4GQXvwPzw>
- The Economist. (2009, November 17). Triple bottom line. *The Economist*.
- UN Global Compact. (n.d.a). *About the UN Global Compact*. UN Global Compact. <https://www.unglobalcompact.org/about>
- UN Global Compact. (n.d.b). *The SDGs Explained for Business*. UN Global Compact: <https://www.unglobalcompact.org/sdgs/about>
- UN Global Compact. (n.d.c). *Who we are*. UN Global Compact: <https://www.unglobalcompact.org/what-is-gc>
- United Nations. (n.d.a). *The Climate Crisis - A Race We Can Win*. United Nations. <https://www.un.org/en/un75/climate-crisis-race-we-can-win>
- United Nations. (n.d.b). *The Paris Agreement*. United Nations. <https://www.un.org/en/climatechange/paris-agreement>
- United Nations. (n.d.c). *The 17 goals*. United Nations. <https://sdgs.un.org/goals>
- United Nations. (2021d, September 20). *UN Secretary General António Guterres Opens SDG Moment 2021 #UNGA* [Video]. YouTube. <https://www.youtube.com/watch?v=rcJtjRNlip4>
- University of Wisconsin. (n.d). *The Triple Bottom Line*. University of Wisconsin. <https://sustain.wisconsin.edu/sustainability/triple-bottom-line/>
- Unruh, G., Kiron, D., Kruschwitz, N., Reeves, M., Rubel, H., & Felde, A. M. (2016). Investing For a Sustainable Future: Investors care more about sustainability than many executives believe. *MIT Sloan Management Review*, 57(4), 3-29.

<http://www.truevaluemetrics.org/DBpdfs/ImpactInvesting/MITSMR-BCG-Investing-for-a-Sustainable-Future-2016.pdf>

Widener, S. K. (2007). An empirical analysis of the levers of control framework. *Accounting, organizations, and society*, 32(7-8), 757-788. <https://doi.org/10.1016/j.aos.2007.01.001>

World Commission on Environment and Development. (1987). *Our Common Future*. Retrieved from Press. <https://sustainabledevelopment.un.org/content/documents/5987our-common-future.pdf>

Yin. R. K. (2018). *Case study research and applications: design and methods* (6th ed.). SAGE.

Appendix 1

Interview guide Mestergruppen, interview round 1

Questions	Follow-up questions
Part One - Introduction (5 minutes)	
Introduction of ourselves and the project	<ul style="list-style-type: none"> Name, age, where from, school and profile Introduction of the thesis topic
Introduce yourself	<ul style="list-style-type: none"> Your position and responsibility in Mestergruppen How long have you been working in the company?
Part Two - Interview questions (50 minutes)	
Sustainability in Mestergruppen (10 minutes)	
How has Mestergruppen evolved as an organization? Is it different now compared to when you began, if yes, how?	<ul style="list-style-type: none"> What are the biggest concrete changes made in Mestergruppen compared to how the organization was before?
What is Mestergruppen's concrete actions regarding sustainability today (daily work)?	<ul style="list-style-type: none"> What challenges does Mestergruppen face today regarding sustainability and what challenges do the construction industry face? What is Mestergruppen's short term and long-term plans for sustainability? Does Mestergruppen use the SDGs as inspiration in their sustainability goals and work? <ul style="list-style-type: none"> How do these goals affect Mestergruppen's daily work? Do you have a culture for sustainability? <ul style="list-style-type: none"> How does Mestergruppen mobilize the employees to be a part of this culture? Are there any differences between the different companies within Mestergruppen regarding sustainability?

MCS and sustainability (30 minutes)	
In general, how is Mestergruppen managed?	
How does Mestergruppen implement sustainability in its management?	
How does sustainability influence or are being influenced by Mestergruppen's core values and purpose?	<ul style="list-style-type: none"> • Does Mestergruppen prioritize some values over others? Which? • What role do the values have in your daily work?
What are rules and norms in Mestergruppen and how do they work?	<ul style="list-style-type: none"> • What are the guidelines if you break the rules? • Are the rules and norms similar when there is a sustainability focus? • Are there any rules or norms specifically for sustainability?
How do you monitor organizational outcomes, correct deviations, and manage your goals?	<ul style="list-style-type: none"> • Can you mention the most important KPIs and how they influence the work of the employees? • Do you have any KPIs for sustainability, and how do you work with these vs. other KPIs, e.g., financial KPIs? (Explain with examples) <ul style="list-style-type: none"> ○ If yes: <ul style="list-style-type: none"> ■ How is the achievement of sustainability goals/KPIs rewarded compared to the other goals/KPIs? ■ Do you have any challenges regarding sustainability KPIs? ○ If no: <ul style="list-style-type: none"> ■ Why not? (Any barriers? challenges?) • In general, do you have a backward looking or forward-looking approach? <ul style="list-style-type: none"> ○ E.g., using budget or quickly adapting to new changes/trends in decision-making processes? • Do you report on sustainability? <ul style="list-style-type: none"> ○ If yes:

	<ul style="list-style-type: none"> ■ Are there any requirements of what to report and do you include these in your KPIs? ■ Do you include your KPIs in the reporting? ○ If no: <ul style="list-style-type: none"> ■ Why not? Does Mestergruppen have a plan to report sustainability? ● How do you design your KPIs and how often do you adjust them to meet new changes?
How do employees, in all levels in the organization, communicate, and how does the organization facilitate innovation?	<ul style="list-style-type: none"> ● How do you work with sustainability and who has this as their area of responsibility? <ul style="list-style-type: none"> ○ Do you have a department of sustainability? ○ Who has the opportunity to innovate in relation to sustainability? ● When making a decision, who do you include in the process and which communication tools do you use? <ul style="list-style-type: none"> ○ I.e., face-to-face discussion, workshops, suggestion box
Stakeholders (10 minutes)	
Can you mention the different types or categories of Mestergruppen's stakeholders?	<ul style="list-style-type: none"> ● Does Mestergruppen have any key stakeholders? <ul style="list-style-type: none"> ○ Are these prioritized more than others? ● Does Mestergruppen prioritize the stakeholders differently regarding sustainability? ● What role do the shareholders have in Mestergruppen and how important are they? ● How important are the end users' preferences in Mestergruppen's decision-making in relation to sustainability?
Part Three - Final remarks (5 minutes)	

Regarding the garage-case: can you tell us what type of materials might be interesting to analyze in relation to sustainability?	<ul style="list-style-type: none">• Do you have some data of a standard garage?
What is the first thing Mestergruppen should do to become more sustainable if it was up to you?	
Is there anything else, regarding the discussion of these topics, that you want to elaborate on?	
Do you have any questions?	

Appendix 2

Interview guide Mestergruppen, interview round 2

Questions	Follow-up questions
Sustainability in the value chain (7 min)	
Can you elaborate on Mestergruppen's vision?	<ul style="list-style-type: none"> Is sustainability a part of this vision? How?
Can you explain which measures Mestergruppen's headquarters did to get the certification of "Miljøfyrtårn"?	<ul style="list-style-type: none"> How are Mestergruppen working to get the whole group to become certified and when do you think this can be accomplished (some or multiple years?)
Can you elaborate on Mestergruppen's value chain and stakeholders in more detail?	<ul style="list-style-type: none"> How do you work on implementing sustainability in the whole value chain?
Sustainability Indicators role (18min)	
Decision making (6min)	
How do you think sustainability indicators could affect decision-making in Mestergruppen?	<ul style="list-style-type: none"> How can the management team use sustainability indicators in decision-making to reach carbon neutrality? Could sustainability indicators affect Mestergruppen's acquisitions of different suppliers? In the future do you think Mestergruppen needs to change its different stakeholders in order to become more sustainable? (Shareholders, suppliers etc?)
Control system (6 min)	
How do you think sustainability indicators could affect the control system in Mestergruppen?	<ul style="list-style-type: none"> With a complex value chain, how can sustainability indicators contribute to a better and more complete control system in Mestergruppen? How do you think sustainability indicators can create new boundaries for the employees and Mestergruppen in general? <ul style="list-style-type: none"> How do you think sustainability indicators can facilitate

	autonomy within these boundaries?
External reporting (6 min)	
How do you think sustainability indicators could affect Mestergruppen's external reporting?	<ul style="list-style-type: none"> • How could sustainability indicators help Mestergruppen to become more transparent for all stakeholders? • How can sustainability indicators help Mestergruppen to meet future requirements for reporting (ex: carbon emissions, social and environmental dimensions, triple bottom line)
The UN SDGs (5 min)	
Is Mestergruppen planning to implement more than one SDG (nr. 13) in the future?	<ul style="list-style-type: none"> • Which SDGs do you think might be valuable to implement? • How do you think implementing more SDGs and using them as a backbone of the organization can help Mestergruppen to manage the decision-making, control, and external reporting in a sustainable direction? • Which measures need to be taken in order to implement more SDGs into the whole value chain? <ul style="list-style-type: none"> ○ Do you think it is possible for the whole value chain to become sustainable?

Appendix 3

Consent form

Are you interested in taking part in the research project:

“The role of sustainability indicators and their impact on decision-making and control”?

This is an inquiry about participation in a research project where the main purpose is to examine the design and use of sustainability indicators in an organizational and industrial setting. In this letter we will give you information about the purpose of the project and what your participation will involve.

Purpose of the project

The research project is a master’s thesis which during the current semester will be conducted by two students at NHH. The students are taking a master’s degree in Economics and Business Administration and are both specializing in Business Analysis and Performance Management. The purpose of the project is to investigate the design and use of sustainability indicators in an organizational and industrial setting. The main research question for the project are as follows:

What is the role of sustainability indicators and how do they impact decision-making and control in an organization?

To answer these questions, we are going to conduct a single case study with Mestergruppen in the construction sector.

The master’s thesis will be published in NHH’s register and as an academic project in collaboration with the non-profit tech foundation: TERRAVERA. Our contact person and collaborator on behalf of TERRAVERA is Gyda Bjercke, the Head of Academic Program.

Who is responsible for the research project?

The Norwegian School of Economics is responsible for the project. Our supervisor for the project is Daniel Johanson who is an associate professor at the Department of Accounting, Auditing and Law. In addition, we are collaborating with the tech foundation TERRAVERA

which through its academic program presents the opportunity to have our research applied to a real-world case by implementing it to their sustainability modelling platform, TerraPortal.

Why are you being asked to participate?

We ask you to participate in the project based on a theoretical selection where we choose participants based on the need for information for the master's thesis. We wish to include 3-4 employees within different positions in Mestergruppen to get a selection that can give us a broader insight into the organization. We have received the contact details from the foundation TERRAVERA.

What does participation involve for you?

The methods that will be used in the collection of data are interviews, documents, and reports to create indicators. If you choose to participate in the project this will involve you taking part in one or two interviews. The first interview will last about one hour, while the second one most likely will be shorter. The second interview will only be necessary if we need to clarify something or need more information. You have the opportunity to choose only to participate in one interview. We are open to have interviews both physically and digitally, depending on what you prefer. Since the master thesis is going to be written in English, we wish to do the interviews in English as well. The information that will be gathered is the employee's perception of the MCS, which include rules, values and purpose, targets and interactivity and communication. There will be notes taken from the interview in addition to an audio recording. This is so we will be able to transcribe the data correctly.

Participation is voluntary

Participation in the project is voluntary. If you chose to participate, you can withdraw your consent at any time without giving a reason. All information about you will then be made anonymous. There will be no negative consequences for you if you choose not to participate or later decide to withdraw. To withdraw consent, you can contact the project manager by email or telephone.

Your personal privacy – how we will store and use your personal data

We will only use your personal data for the purposes specified in this information letter. We will process your personal data confidentially and in accordance with data protection legislation (the General Data Protection Regulation and Personal Data Act). Those who will have access to the collected data are:

-
- The master's students that perform the project at Norwegian School of Economics: Christine Sekkesæter and Ylva Gjelten.
 - The supervisor for this project at Norwegian School of Economics: Daniel Johanson.
 - The contact person and collaborator on behalf of TERRAVERA: Gyda Bjercke.

Measures taken to ensure that no unauthorized persons can access the personal data are that we will replace name with a number and keep registered names and contact information on a separate list of names from other data.

The publication will include the company's name unless the company wants us to anonymize it. The position of the interviewees in Mestergruppen will be included so that we can use it to discuss different perceptions at the organization's different levels. This might be a factor that identifies the participants to a certain extent, but we will try to generalize the different positions by using general terms such as "member of the board" and "employee in the HR-department".

What will happen to your personal data at the end of the research project?

The project is scheduled to end 20.12.2021, and after this date, different actions to anonymize the data will be done. Personal information and audio recordings will be deleted.

Your rights

You will be sent the master's thesis after it is finalized and will then have the opportunity to approve quotes and information. So long as you can be identified in the collected data, you have the right to:

- Access the personal data that is being processed about you
- Request that your personal data is deleted
- Request that incorrect personal data about you is corrected/rectified
- Receive a copy of your personal data (data portability), and
- Send a complaint to the Data Protection Officer or The Norwegian Data Protection Authority regarding the processing of your personal data

What gives us the right to process your personal data?

We will process your personal data based on your consent. Based on an agreement with the Norwegian School of Economics, NSD – The Norwegian Centre for Research Data AS has

assessed that the processing of personal data in this project is in accordance with data protection legislation.

Where can I find out more?

If you have questions about the project, or want to exercise your rights, contact:

- The Norwegian School of Economics via Ylva Gjelten
- The Norwegian School of Economics via Christine Sekkesæter
- The Norwegian School of Economics via associate professor Daniel Johanson
- TERRAVERA Academic Program via Gyda Bjercke
- Our Data Protection representative: NHHs Data Protection representation
personvernombud@nhh.no

If you have questions regarding the evaluation of the project by NSD, contact:

NSD – The Norwegian Centre for Research Data AS, by email:
(personverntjenester@nsd.no) or by telephone: +47 55 58 21 17.

Yours sincerely,

Daniel Johanson

Christine Sekkesæter

Ylva Gjelten

(Researcher/supervisor)

(Master student)

(Master student)

Consent form

I have received and understood information about the project “*Sustainability indicators’ impact on decision-making, control, and external reporting*” and have been given the opportunity to ask questions. I give consent:

- ☐ to participate in an interview
- ☐ to potentially participate in a second interview
- ☐ that the interview will be audio recorded to ensure correct use of the data
- ☐ for information about my position to be published in a way that I potentially can be recognized

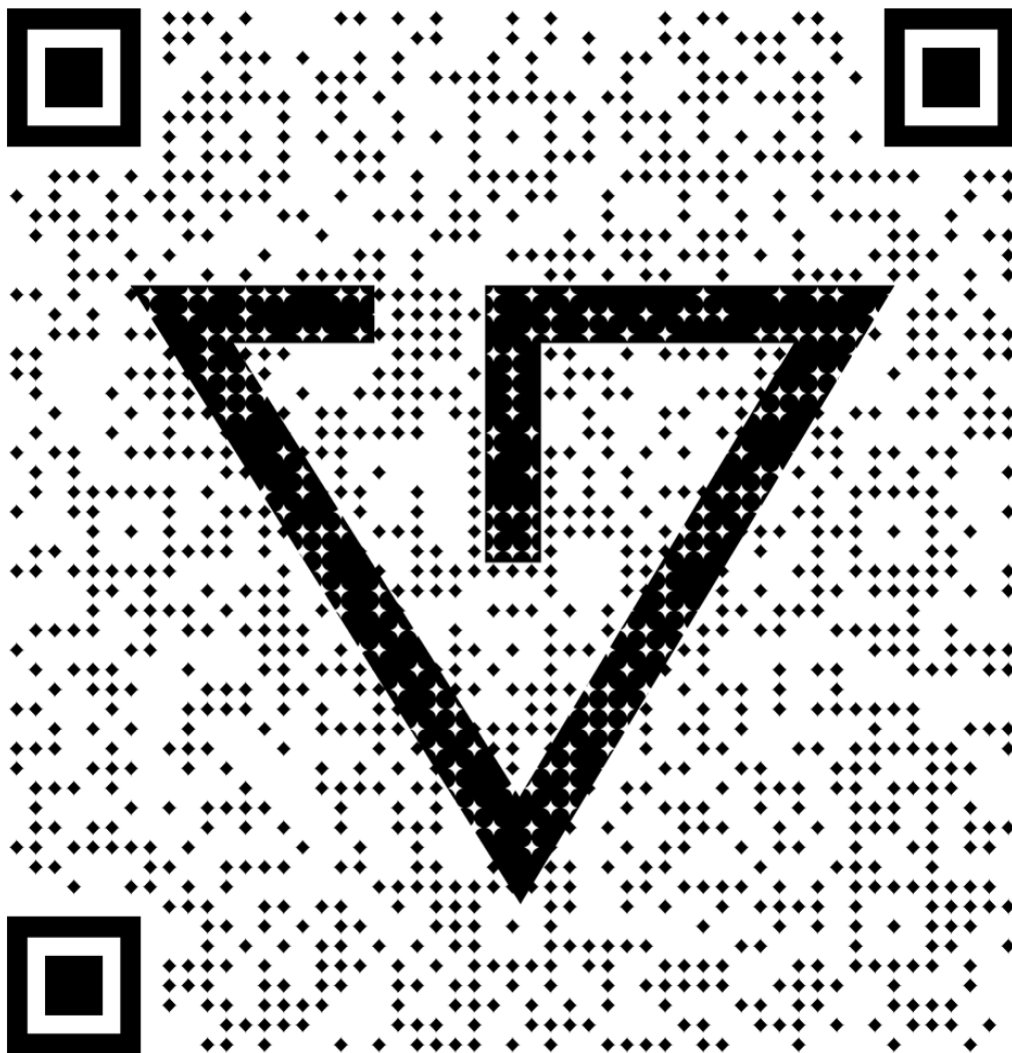
I give consent for my personal data to be processed until the end date of the project, approx. 20.12.2021

(Signed by participant, date)

Appendix 4

Development of sustainability indicators for the TerraPortal

QR code for the landing page:



Calculations in Excel:

GWP concrete B35								
Concrete type	Supplier (Market: Norway)	Unit	Value A1 (Raw materials)	Value A2 (Transportation)	Value A3 (Construction)	Value A4 (Transportation)	Sum	Difference from average
Ready-mixed Industry Standard	Sylteosen Betong AS	Kg CO2 -eq/m3	273	9,35	0,108	0,812	283,27	8,355
Ready-mixed Industry Standard	Alltid Betong AS	Kg CO2 -eq/m3	246	1,79	5,65	5,08	258,52	-16,395
Ready-mixed Industry Standard	AS Uthaug Sementstøperi	Kg CO2 -eq/m3	238	29	1,99	9,99	278,98	4,065
Ready-mixed Industry Standard	Ulstein Betong AS	Kg CO2 -eq/m3	262	10,4	1,41	5,08	278,89	3,975
Average		Kg CO2 -eq/m3	254,75	12,635	2,2895	5,2405	274,915	
Ready-mixed Low Carbon A	Blanderiet AS	Kg CO2 -eq/m3	181	15,5	1,48	5,59	203,57	-4,345
Ready-mixed Low Carbon A	Helgeland Betong	Kg CO2 -eq/m3	197	9,47	3,74	2,05	212,26	4,345
Average		Kg CO2 -eq/m3	189	12,485	2,61	3,82	207,915	

Waste HW concrete B35							
Concrete type	Supplier (Market: Norway)	Unit	A1 (Raw materials)	A2 (Transportation)	A3 (Construction)	A4 (Transportation)	Sum
Ready-mixed Industry Standard	Sylteosen Betong AS	Kg/m3	0,000397	0,0000754	0,00000241	0,0000096	0,00048441
Ready-mixed Industry Standard	Alltid Betong AS	Kg/m3	0,00101	0,000023	0,0000402	0,00006	0,0011332
Ready-mixed Industry Standard	AS Uthaug Sementstøperi	Kg/m3	0,000834	0,00028	0,0000171	0,000118	0,0012491
Ready-mixed Industry Standard	Ulstein Betong AS	Kg/m3	0,000402	0,00006	0,0000234	0,00006	0,0005454
Average		Kg/m3	0,00066075	0,0001096	0,0000207775	0,0000619	0,0008530275
Ready-mixed Low Carbon A	Blanderiet AS	Kg/m3	0,00117	0,00014	0,000056	0,0000661	0,0014321
Ready-mixed Low Carbon A	Helgeland Betong	Kg/m3	0,000775	0,0000965	0,0000468	0,0000242	0,0009425
Average		Kg/m3	0,0009725	0,00011825	0,0000514	0,00004515	0,0011873

Waste NHW concrete B35							
Concrete type	Supplier (Market: Norway)	Unit	A1 (Raw materials)	A2 (Transportation)	A3 (Construction)	A4 (Transportation)	Sum
Ready-mixed Industry Standard	Sylteosen Betong AS	Kg/m3	48	1,38	0,142	1,25	50,772
Ready-mixed Industry Standard	Alltid Betong AS	Kg/m3	35	2,76	0,783	7,84	46,383
Ready-mixed Industry Standard	AS Uthaug Sementstøperi	Kg/m3	45,9	9,1	0,375	15,4	70,775
Ready-mixed Industry Standard	Ulstein Betong AS	Kg/m3	47,1	4,11	1,05	7,84	60,1
Average		Kg/m3	44	4,3375	0,5875	8,0825	57,0075
Ready-mixed Low Carbon A	Blanderiet AS	Kg/m3	30,8	24	1,2	8,63	64,63
Ready-mixed Low Carbon A	Helgeland Betong	Kg/m3	39,2	4,05	21,9	3,16	68,31
Average		Kg/m3	35	14,025	11,55	5,895	66,47

Standard garage - Materials		Stage	Explanation
Material: Concrete		A1	Raw Materials
Concrete unit:	m3	A2	Transportation (to manufacturing)
Concrete B35 in cover:	3,05	A3	Manufacturing
Concrete B35 in element:	1,51	A4	Transportation (to construction)
Sum	4,56		

Indicator in the dataset	Unit	Value Industry Standard (1)	Value Low Carbon A (2)	Calculations (1)	Calculations (2)	Dataset (1)	Dataset (2)	Indicator expression	
GWP for concrete B35									
Global Warming Potential (GWP)									
GWP concrete A1 per m3	GWP_concrete_A1_per_m3	Kg CO2-eq/m3	254,75	189		GWP_concrete_A1_per_m3 = 254,75	GWP_concrete_A1_per_m3 = 189	GWP_concrete_A1_per_m3 = GWP_concrete_A1_per_m3	
GWP concrete A2 per m3	GWP_concrete_A2_per_m3	Kg CO2-eq/m3	12,635	12,485		GWP_concrete_A2_per_m3 = 12,635	GWP_concrete_A2_per_m3 = 12,485	GWP_concrete_A2_per_m3 = GWP_concrete_A2_per_m3	
GWP concrete A3 per m3	GWP_concrete_A3_per_m3	Kg CO2-eq/m3	2,2895	2,61		GWP_concrete_A3_per_m3 = 2,2895	GWP_concrete_A3_per_m3 = 2,61	GWP_concrete_A3_per_m3 = GWP_concrete_A3_per_m3	
GWP concrete A4 per m3	GWP_concrete_A4_per_m3	Kg CO2-eq/m3	5,2405	3,82		GWP_concrete_A4_per_m3 = 5,2405	GWP_concrete_A4_per_m3 = 3,82	GWP_concrete_A4_per_m3 = GWP_concrete_A4_per_m3	
GWP concrete A1	GWP_concrete_A1	Kg CO2-eq	1161,66	861,84	254,75*4,56	189*4,56	GWP_concrete_A1_per_m3 = 254,75 Sum_concrete_in_garage = 4,56	GWP_concrete_A1_per_m3 = 189 Sum_concrete_in_garage = 4,56	GWP_concrete_A1= GWP_concrete_A1_per_m3 * Sum_concrete_in_garage
GWP concrete A2	GWP_concrete_A2	Kg CO2-eq	57,6156	56,9316	12,635*4,56	12,485*4,56	GWP_concrete_A2_per_m3 = 12,635 Sum_concrete_in_garage = 4,56	GWP_concrete_A2_per_m3 = 12,485 Sum_concrete_in_garage = 4,56	GWP_concrete_A2= GWP_concrete_A2_per_m3 * Sum_concrete_in_garage
GWP concrete A3	GWP_concrete_A3	Kg CO2-eq	10,44012	11,9016	2,2895*4,56	2,61*4,56	GWP_concrete_A3_per_m3 = 2,2895 Sum_concrete_in_garage = 4,56	GWP_concrete_A3_per_m3 = 2,61 Sum_concrete_in_garage = 4,56	GWP_concrete_A3= GWP_concrete_A3_per_m3 * Sum_concrete_in_garage
GWP concrete A4	GWP_concrete_A4	Kg CO2-eq	23,89668	17,4192	5,2405*4,56	3,82*4,56	GWP_concrete_A4_per_m3 = 5,2405 Sum_concrete_in_garage = 4,56	GWP_concrete_A4_per_m3 = 3,82 Sum_concrete_in_garage = 4,56	GWP_concrete_A4 = GWP_concrete_A4_per_m3 * Sum_concrete_in_garage
Material characteristics									
Lifetime concrete	Lifetime_concrete	Years	60	60					

Waste end of life								
<i>Hazardous waste (HW)</i>								
HW concrete A1 per m3	HW_concrete_A1_per_m3	Kg/m3	0,00066075	0,0009725	HW_concrete_A1_per_m3 = 0,00066075	HW_concrete_A1_per_m3 = 0,0009725	HW_concrete_A1_per_m3 = HW_concrete_A1_per_m3	
HW concrete A2 per m3	HW_concrete_A2_per_m3	Kg/m3	0,0001096	0,00011825	HW_concrete_A2_per_m3 = 0,0001096	HW_concrete_A2_per_m3 = 0,00011825	HW_concrete_A2_per_m3 = HW_concrete_A2_per_m3	
HW concrete A3 per m3	HW_concrete_A3_per_m3	Kg/m3	0,0000207775	0,0000514	HW_concrete_A3_per_m3 = 0,0000207775	HW_concrete_A3_per_m3 = 0,0000514	HW_concrete_A3_per_m3 = HW_concrete_A3_per_m3	
HW concrete A4 per m3	HW_concrete_A4_per_m3	Kg/m3	0,0000619	0,00004515	HW_concrete_A4_per_m3 = 0,0000619	HW_concrete_A4_per_m3 = 0,00004515	HW_concrete_A4_per_m3 = HW_concrete_A4_per_m3	
HW concrete A1	HW_concrete_A1	Kg	0,00301302	0,0044346 0,00066075*4,56	0,0009725*4,56 HW_concrete_A1_per_m3 = 0,00066075 Sum_concrete_in_garage = 4,56	0,0009725 HW_concrete_A1_per_m3 = 0,0009725 Sum_concrete_in_garage = 4,56	HW_concrete_A1 = HW_concrete_A1_per_m3 * Sum_concrete_in_garage	
HW concrete A2	HW_concrete_A2	Kg	0,000499776	0,00053922 0,0001096*4,56	0,00011825*4,56 HW_concrete_A2_per_m3 = 0,0001096 Sum_concrete_in_garage = 4,56	0,00011825 HW_concrete_A2_per_m3 = 0,00011825 Sum_concrete_in_garage = 4,56	HW_concrete_A2 = HW_concrete_A2_per_m3 * Sum_concrete_in_garage	
HW concrete A3	HW_concrete_A3	Kg	0,0000947454	0,000234384 0,0000207775*4,56	0,0000514*4,56 HW_concrete_A3_per_m3 = 0,0000207775 Sum_concrete_in_garage = 4,56	0,0000514 HW_concrete_A3_per_m3 = 0,0000514 Sum_concrete_in_garage = 4,56	HW_concrete_A3 = HW_concrete_A3_per_m3 * Sum_concrete_in_garage	
HW concrete A4	HW_concrete_A4	Kg	0,000282264	0,000205884 0,0000619*4,56	0,00004515*4,56 HW_concrete_A4_per_m3 = 0,0000619 Sum_concrete_in_garage = 4,56	0,00004515 HW_concrete_A4_per_m3 = 0,00004515 Sum_concrete_in_garage = 4,56	HW_concrete_A4 = HW_concrete_A4_per_m3 * Sum_concrete_in_garage	
<i>Non-Hazardous waste (NHW)</i>								
NHW concrete A1 per m3	NHW_concrete_A1_per_m3	Kg/m3	44	35	NHW_concrete_A1_per_m3 = 44	NHW_concrete_A1_per_m3 = 25	NHW_concrete_A1_per_m3 = NHW_concrete_A1_per_m3	
NHW concrete A2 per m3	NHW_concrete_A2_per_m3	Kg/m3	4,3375	14,025	NHW_concrete_A2_per_m3 = 4,3375	NHW_concrete_A2_per_m3 = 14,025	NHW_concrete_A2_per_m3 = NHW_concrete_A2_per_m3	
NHW concrete A3 per m3	NHW_concrete_A3_per_m3	Kg/m3	0,5875	11,55	NHW_concrete_A3_per_m3 = 0,5875	NHW_concrete_A3_per_m3 = 11,55	NHW_concrete_A3_per_m3 = NHW_concrete_A3_per_m3	
NHW concrete A4 per m3	NHW_concrete_A4_per_m3	Kg/m3	8,0825	5,895	NHW_concrete_A4_per_m3 = 8,0825	NHW_concrete_A4_per_m3 = 5,895	NHW_concrete_A4_per_m3 = NHW_concrete_A4_per_m3	
NHW concrete A1	NHW_concrete_A1	Kg	200,64	159,6 44*4,56	35*4,56 NHW_concrete_A1_per_m3 = 44 Sum_concrete_in_garage = 4,56	25 NHW_concrete_A1_per_m3 = 25 Sum_concrete_in_garage = 4,56	NHW_concrete_A1 = NHW_concrete_A1_per_m3 * Sum_concrete_in_garage	
NHW concrete A2	NHW_concrete_A2	Kg	19,779	63,954 4,3375*4,56	14,025*4,56 NHW_concrete_A2_per_m3 = 4,3375 Sum_concrete_in_garage = 4,56	14,025 NHW_concrete_A2_per_m3 = 14,025 Sum_concrete_in_garage = 4,56	NHW_concrete_A2 = NHW_concrete_A2_per_m3 * Sum_concrete_in_garage	
NHW concrete A3	NHW_concrete_A3	Kg	2,679	52,668 0,5875*4,56	11,55*4,56 NHW_concrete_A3_per_m3 = 0,5875 Sum_concrete_in_garage = 4,56	11,55 NHW_concrete_A3_per_m3 = 11,55 Sum_concrete_in_garage = 4,56	NHW_concrete_A3 = NHW_concrete_A3_per_m3 * Sum_concrete_in_garage	
NHW concrete A4	NHW_concrete_A4	Kg	36,8562	26,8812 8,0825*4,56	5,895*4,56 NHW_concrete_A4_per_m3 = 8,0825 Sum_concrete_in_garage = 4,56	5,895 NHW_concrete_A4_per_m3 = 5,895 Sum_concrete_in_garage = 4,56	NHW_concrete_A4 = NHW_concrete_A4_per_m3 * Sum_concrete_in_garage	