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The connection between organizational incentive theory and sustainable construction

A qualitative study on how businesses in the construction industry are incentivized with respect to sustainability in Norway

Alexander Lindgaard Føll & Benjamin Wergeland Asheim

Supervisor: Professor Marcus Selart

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Abstract

This master thesis aims to identify the main drivers and barriers to incentivize sustainable practices in the construction industry in Norway. In order to do this the thesis presents five research questions than culminates in a five-step model that aims to identifies the stances and attitudes in the industry in regard to sustainability, the internal and external incentives, how these are weighed and lastly, with this knowledge, how to effectively incentivize towards sustainability. In order to obtain the answers to the research questions, we conducted a semi-structured interview followed by a questionnaire with ten respondents from medium to large organizations in the construction industry in line with grounded theory. By categorizing incentives internally and externally, we have found customer demand- and purchasing power, interpretation of national and international rules and legislation, implementation of system thinking, information flow between market participants, alignment of incentives, increased competitiveness, influence of top management and organizational culture considerations to some of the most pressing incentive schemes. These results are interesting and a good pointer towards effective measures of increasing degree of focus on sustainability in the construction industry. However, future research is necessary in order to confidently conclude and statistically prove our findings. This thesis contributes to a way to better understand why organizations chooses sustainable solutions, to identify the incentives that affect sustainable decision making, and how to use this information effectively.

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Both of us possess a genuine interest in the field of sustainability, gained from subjects at NHH and case studies. Given the nature of the increasing sustainability focus in Norway, this master thesis offered a remarkable opportunity to explore our interest and became a fitting topic of our thesis. The master thesis has become a valuable learning experience, and throughout its course has strengthened our interest in the field of sustainability.

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Alexander Lindgaard Føll

Benjamin Wergeland Asheim

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1. Introduction

1.1 Background/actuality

Ever since the 1700s and the likes of the industrial revolution mankind has acquired a linear viewpoint concerning production and consumption. This is reflected in a "take, make, use, waste"-model, with limited attention to the life cycles of natural resources, which in turn has led to a worrisome deficiency of resources and an extreme stress on the world's environment (Braungart et al, 2010). Furthermore, the global population is expected to increase substantially in the coming decades which could exhaust natural resources even more with increased demand for food and energy (Riding et al, 2015). This linear model could prove itself to be flawed with respect to the environmental challenges we are facing. In other words, there is untapped potential for new sustainable solutions.

In order to change practices of today and accelerate a shift towards a more sustainable model several diverse, political initiatives have emerged. The Paris Agreement is an example, which marks an important international position in regards such a linear approach. The Paris Agreement is an internationally binding agreement ratified by 190 countries as well as the EU, and implicitly assumes that the world's population must change its pattern of behaviour about production and consumption in order to meet demands of the future (United Nations, 2015).

A proposed substitute to the linear model could be a circular approach and an entirely circular economy (CE). Although this is not a new concept, one could argue that CE has only lately come to be a systematic and viable option in national and international environmental strategies. CE is denoted as an economic system where production processes and production are designed to maximize lifetime value, thus reducing material input and waste generation in production. It aims to have a positive influence on the environment, the economy as well as social aspects like future generations and human well-being (Kirchherr et al, 2017). Circular Gap Report Norway conducted an analysis in 2020, where they reported that an estimate of just above 97 % of the consumed materials used in Norway do not return to the economic cycle (Circular Norway, 2020), which leaves room for enhancements. The building and construction segment is a large contributor to material usage and holds a key position if one is to be successful in turning the economy circular.

In Norway, the construction industry is a big industry and a large source for the waste generation. As of 2019, the construction industry is responsible for 25 % of waste generation, with 1,8 million tons generated in new construction, rehabilitation, and demolition, while 1 million tons is generated in other construction activities (Byggemiljø, 2020). Of this waste generation, 35 % of waste is generated in new constructions, 25 % from rehabilitation and 40 % from demolition (Rodahl, 2019). Statistics show that the construction industry contributes heavily towards unsustainable development, and its impact on both the economy and the environment, is high. (AlSanad, 2015). Globally, the construction industry consumes 40 % of total energy produced, 40 % of all raw materials […] and contributes to 35 % of global CO2 emissions (Son et al, 2011; Wang et al, 2005). The industry generates between 45 to 65 % of the waste deposited in landfills (Yudelson, 2008). As with the expected population growth, so is the waste generation expected to grow. The enormous amount of waste generation and material consumption gives the construction industry an enormous potential for growth within sustainability and potentially the CE, where even small changes in practices can contribute to large, positive results for the environment and society.

Material recycling is a key focus in the CE, where waste recycling leads to materials from landfills being used as raw materials in the production of new products, whether that be in the same industry or in other industries (Loop, 2018). Material recycling has been one of the focus areas in the construction industry. As of today, Norway has an estimated recycling rate of 50 %, which is far below the target of 70 % set by the EU framework directive (Miljøverndepartementet, 2013).

An interesting question to study is why businesses choose to become sustainable and in some cases structure towards a more circular model. Is this in order to meet regulations set by the government, meet public expectations, uphold a certain image reputation, are there financial gains to be captured in this process, or is it a combination of the aforesaid? In discovering the motivations that drive businesses towards sustainable solutions, one can analyze different solutions to incentivize businesses to become more sustainable and look closer at why some incentives work and why others don't.

1.2 Purpose and research questions

The construction industry represents the third largest contributor to greenhouse gas emissions that threaten the Earth's climate, after power generation and automobile usage (IPCC, 2019). The negative impacts of the construction industry on the environment and the population are both serious and alarming (AlSanad, 2015). There is concern about how to improve construction practices to tackle the effects on the natural environment (Cole, 1999; Holmes et al, 2000). With an industry that is densely geared to replacement rather than repairs, reusability and sustainable design of products and services (Pitt et al, 2009), there seem to be future potential. A significant survey by ACE (the Association for the Conservations of Energy), interviewing stakeholders like property managers, architects, and facilities managers, concluded that there was progress in areas, but emphasized that more was needed to be done (ACE, 2003). This is also underlined by another academic research on the topic (Shelbourn et al, 2015; Reynsford et al, 2000).

The term sustainability is commonly defined as utilizing resources to meet the needs is the present without compromising the future generation's ability to meet their own needs (WCED, 1987). Albeit some argue that there is no commonly accepted definition of sustainability within the industry and sustainable construction (Pitt et al, 2009). As a research area, sustainable construction is diverse and has undergone several developments, from conceptualizing constituents like social sustainability, biophysical sustainability and economic sustainability, to performance criterions and measurements, recycling and waste reduction, material management and the emergence of own topics such as *green construction* (Czarnecki et al, 2010; Hill et al, 1997; Udomsop et al, 2019, Ali et al, 2009). Despite research diversity, most of them tend to focus on how one could implement and increase sustainable practices in the industry, such as research by Spence et al (1995), Gan et al (2015), Shelbourn et al (2015) and Reynsford et al (2000).

Amid these infliction points, there are behavioural effects and incentive structures in place for business stakeholders which, and there is reason to believe there is explanatory power in these incentive structures and business behaviour (Huber et al, 2015). Thus, from a business perspective it is important to get insights into the behavioural mechanisms for employees that lie behind, which in this instance is provided from middle-management in medium-sized and large businesses in the industry. Acknowledgement of the impact of the industry on society has led the global construction industry to take increasingly aggressive steps aimed at

embracing more sustainable practices (Kibert, 2007). Therefore, the purpose of the thesis is to clarify how the construction industry can meet future demand for more sustainable buildings, and how they can increase the degree of sustainability and circular economy in the industry, and the incentive structures that possibly correspond.

We have formulated five research questions for the thesis to throw light on some of these aspects, as a result of sub-purposes we are about to discuss. Although we will discuss this in more length in the theory section, we will briefly talk through the research questions in a purpose driven context in this section. The research questions are formulated in mainly a sequential manner, where the first question leads to the second research question, and so on. This is to create an easy-to-understand structure and makes the thesis easy to follow, as well as it gives an intuitive sense. We have made a model to go more in-depth, which will be introduced in the theory section. These research questions have been formulated, because one of the thesis' main purposes is to investigate new aspects and nuances related to examples like: how do the companies view themselves with respect to sustainability/CE? Which incentivizing aspects and perspectives are ruling with respect to sustainability/CE according to companies in the industry? Do they think each of them weigh equally? Which motivational perspectives are the companies able to come up with in total?

The thesis has a significant focus on the relationship between incentives and motivational factors and actual behaviour with respect to sustainable construction - all this while capturing nuances when it comes to attitudes concerning the topics. This is in line with existing research (Mozes et al, 2011; Spence, 1973; Turban et al, 1997). In conjunction with this we have formulated a research problem to try to capture the entirety of these subject matters. It is as follows:

> *How are incentives related to how businesses in the building- and construction industry work with sustainability?*

In relation to this research problem, we have carefully developed five research questions. These research questions are supposed to sort out distinctions dealing with the research problem, and to make structure out of the overall subjects. In an organizational context, the perception from the employees play an important role (Ashforth et al, 1989; Peterson, 2004; Brammer et al, 2007). Thus, we have formulated the first research question:

> *What stance do the business/industry have concerning sustainability/CE?*

Moreover, the thesis will try to explain the relationship between external motivational factors, such as suppliers, regulators, customers and building employers, and internal motivational factors, such as considerations for coming generations, profitability, CSR-considerations and increased attractiveness as an employer (Olubunmi et al, 2016; Durdyev et al, 2018; Hughes et al, 2019; Hallstedt et al, 2010; Presley et al, 2010); how these work interconnected, and how they affect the actual behaviour. To incorporate these distinctions and to provide a contextual framework we have formulated the next two research questions:

> *How do 1) external and 2) internal factors affect how businesses are incentivized in the construction industry, with regards to degree of focus on sustainability/CE?*

This leads to a problematization of the weighting of these motivational factors. This is highly relevant, as it is not necessarily enough to map the motivational factors, as we do not know to which extent the different motivational factors are perceived to be valid or applicable (Augenbroe et al, 1998; AlSanad, 2015; Akadiri, 2015; Berawi et al, 2020; Durdyev et al, 2018). Thus, we will try with this thesis to explore this particular area of interest, and at the same time get nuances from the companies themselves. Because of this, we have formulated the fourth research question:

> *Which incentives weigh more heavily, and which incentives weigh less heavily in the consideration of the degree of efforts towards sustainability/CE?*

In sum, these perspectives provide a contextual framework in which we will try to discuss and shed light on how one possibly could incentivize companies to become more sustainable/more circular. Spence et al (1995), Gan et al (2015) and Du Plessis (2007), amongst others, have previously provided similar research, on recommendations for different stakeholders. Hence, we have formulated the fifth and last research question:

> *How to effectively incentivize companies to become more sustainable/more circular?*

Summarized, do the research questions serve a purpose in exploring and sharing some perspectives and nuances from companies in the industry, which have not already been examined.

1.3 Scope of the thesis and delimitations

For our thesis to be feasible, it is important to make reasonable delineation of the scope and be clear about delimitations (Saunders et al, 2012). In our study, we have limited our sample to ten respondents, which affects the generalisability of our findings (for further information, see section 3.2.3). The reason for this is a combination of the time limitation associated with a master thesis (which in this instance is approximately 18 weeks) and the opted methodology of our study (see chapter 3). The focal point of our research is the connection between organizational incentive theory and sustainable construction, with emphasis on how to incentivize businesses (and their employees) in the industry. Furthermore, we define sustainability in a rather narrow sense, synonymizing it with CE, setting it in a carbon emission context. This contrasts with the holistic view of sustainable construction provided from Hill & Bowen (1997), that divides it into social responsibility, economic sustainability, biophysical sustainability and technical sustainability. Hossein et al (2020) have recently conducted a study reviewing over 100 relating studies, where only a small percentage of studies focused on the environmental dimension (mostly on carbon emissions). We wanted to explore this dimension further and thus we chose to delimit this study to the environmental dimension of the sustainability expression.

Because we have interviewed solely business representatives, and no other stakeholders, such as regulatory bodies and NGOs, we recognize that there are other perspectives not accounted for by other stakeholders. Ideally, we would have scrutinized complete value chains, but that is simply not feasible within the given timeframe.

Furthermore, we have sought data from Norwegian actors and the Norwegian market. Consequently, we relate to a Norwegian context, geographically. In terms of the business sector, we have chosen to focus on the construction industry. We have defined this broadly as a combination of the building- and construction industry. We make this distinction because international research often defines the construction of buildings as construction in general, and it is common to make distinction between building construction (i.e., the set-up of buildings), and industrial construction (i.e., docks, bridges etc.). The industry includes activities related to construction, conversion, repair, maintenance and demolition of buildings, as well as construction and repair of facilities. It also includes products and services necessary to carry out construction work, such as the building materials industry, architectural services

and consulting engineers. It includes both businesses that mainly focus on newly built buildings, and the ones focusing on rehabilitation and demolition of buildings.

Finally, there are natural delimitations related to the choice of methodology, but these are accounted for in chapter 3 Method. Chapter 5.3 exhibits limitations with the study, illustrating the other side of the delimitations brought about in this section. In chapter 6 Conclusion, we provide suggestions for further research beyond the mentioned delimitations.

1.4 Thesis structure

The rest of this thesis will be structured as follows: In chapter 2 literature review we will firstly look at the basic principle of incentive theory, followed by an in depth look at literature focusing on when incentives work and don't work in practice vs. theory. Subsequently, we elaborate on the principles of the circular economy, sustainability and the key similarities and differences between the two. Chapter 3 describes methodology. Here we will introduce the research design and discuss the data quality issues, including the reliability and validity of the test conducted in this thesis. In chapter 4 we will present the results of the study in regards with our research questions. Chapter 5 discusses the results, its practical and theoretical implications, the limitations of the study and ideas for future research. Chapter 6 presents a conclusion of the set research questions.

2. Theory

2.1 Organizational incentive theory

There are many studies on human behavior in an organizational context underpinning the significance of human motivation and incentives. The rather intuitive notion of organizational motivational theory is straightforward; humans' actions within organizations are reflected by a set of characteristics deriving from general human personality traits and/or surrounding conditions. This could be intrinsic, extrinsic, or reputational incentives, either on its own or in combination with the others (Bénabou & Tirole, 2006). Hence, one could attempt to relate human action in organizations with some explanatory power using these theories.

As stated previously, the conceptuality of circular economy is not entirely new, but has rather been reinforced in the latest decades, presumably because of increased research from academia, increased focus in national, international, and multinational politics, as well as media attention due to environmental concerns. A limited number of these organizational behavior studies, however, have examined the relationship between organizational incentives and the development of circularity in the building industry. Conversely, we would like to study why organizations (businesses) in the building industry and the people within it reflect and act with respect to the circularity of their operations.

In the following chapters we will, 1) introduce agent-theory: a framework applying one of the most general organizational incentive models using a principal-agent relationship, and instigate fundamental issues related to the actor's risk and insurance in relation to the model, 2) present key sub-models and discuss incentives in the accordance with compensation schemes, prosocial behavior and contract theory, 3) explain core organizational incentive schemes along the lines of intrinsic, extrinsic, and reputational incentivizing and 4) highlighting central challenges with organizational incentive theories.

2.1.1 The Classic Agency Model: Incentives versus Insurance (Gibbons, 1998)

The classic agency model presents a model for organizational incentivizing that utilizes principles to explain why the actors act in relation to core mechanisms in an organization. As a point of departure, the model introduces the actors: the principal and the agent. The principal

is the one initiating an incentive (often a superior: e.g., manager/senior), whilst the agent is the one being incentivized (often a subordinate: e.g., employee). The organization produces an output, and the general intuition is as follows: the organization's output (y) is equal to an unobservable action (a) by the agent plus a noise term (ε):

$$(1). \qquad y = a + \varepsilon$$

This equation encapsules the essence of the model: the dependent variable which represents output is directly dependent upon the unobservable action of the agent. Interestingly, apart from the noise term, the dependent variable is only dependent on the unobservable action, omitting potential other explanatory variables.

Furthermore, a key concept in the model is the introduction of the actors' payoff. Deriving from (1), the model presents the agent's payoff:

$$(2). \qquad = w - c(a)$$

The model demonstrates that the agent's payoff thus is contingent on the agent's wage (w) and the disutility of the unobservable action (c(a)). The agent's wage consists of the salary (s), bonus rate (b) and the output (y).

$$(3). \qquad w = s + b*y$$

The principal's payoff is depicted as:

$$(4). \qquad = y - w$$

Thus, the actors acquire a payoff dependent on each other, and the general intuition is that each of them are dependent on each other's risk appetite. A fundamental prerequisite in the model is that the agent is risk averse (the principal could as well be risk averse). To put this into context we could assess the agent's wage. If the bonus rate (b) increases, this creates an incentive for the agent. On the other hand, it also inflicts more risk for him. In the extreme case of b = 0, the agent is offered complete insurance, but it doesn't generate any incentives for the agent. In the other extreme case of b = 1 the agent is fully entitled to the output (y)

Effectively, the bonus rate ranges between zero and one, depending on factors such as the amount of risk in the error term (ε) and the parties' risk-aversions.

The example of sharecropping could strengthen the practical aspects of the risk-perspective in the model. Alston and Higgs (1982) investigate three sharecropping contracts: wage labor, where the agent is free of risk (b = 0); crop sharing, where the risk is shared between the agent and the principal (0 < b < 1); and fixed-payment land rental, where all the risk is imposed on the agent (b = 1). Higgs (1973) analyzes specific data from the US for the year 1910. He discovered that areas with higher crop risk increased the extent of risk sharing. Despite this finding, Higgs and Alston (1982) find significant discrepancies within the different set of contracts. For instance, crop-sharing contracts could seem to be suitable for both individuals, as well as families or close-knit organizations. These contracts could also impose restrictions on the agent, such as borrowing tools from the principal for private reasons, bringing ulterior motives for the agent to consider and potentially incentive problems. The authors also find variation in the use of each class of contract, even after they controlled for risk, suggesting that: "[…] the tradeoff between incentives and insurance has some explanatory power, but a great deal is hiding in the unexplained variation".

Middle management seniors, as the agents, in the construction industry could be incentivized by the salary, bonus rate and output, according to Gibbons model. This means that, given the nature of the model, including focus on sustainability work as part of the bonus payout, would be a way to increase effort towards sustainable work.

2.1.1.1 Objective Performance Measurement

In the following section Gibbons describe three static models in which organizations get what they pay for: Baker (1992), Lazear (1989) and Holmström and Milgrom (1991). Their key contribution is to discard the assumption where (y) is denoted as a general "output"-term, relinquishing the simple assumption that this "output" could be easily measured. This is a significant limitation of the principal-agent model. The model doesn't account for the complexity of the measurement of the output (y), as it, in its simplicity, depicts a scenario where the output (y) fully reflects what the principal would care about (given that the principal's payoff is y – w). For the forthcoming theory we will denote (y) as the agent's "total contribution to firm value" rather than as a general output term. The reasoning behind this is to emphasize that it comprises the total number of actions of the agent, as well as all the effects of these actions (both in the long- and short term). Although "total contribution to firm value" to a great extent is a more precise notation than a general "output"-term it doesn't necessarily

represent real life in many organizations. This makes it problematic in terms of the agent's payoff, which largely is dependent on the wage (w), which in turn is dependent of the "total contribution to firm value" (y). Hence, we assume an alternative performance measurement (p) instead of the general "output" term (y). We modify the agent's wage (w):

$$w = s + b*p \tag{5}$$

Also, in this case, a large value of the bonus rate (b) induces strong incentives for the agent, but this time the wage (w) is dependent on the alternative performance measurement (p), as opposed to the output (y). To illustrate the importance of this remodeling we will suppose that the agent can perform two actions, a1 and a2. In this context, the contract w = s+bp creates incentives that depend on the bonus rate (b) as well as the way the actions a1 and a2 influence the alternative performance measurement (p). But Baker (1992) argues that: "the marginal social benefits of the agent's actions depend on how a1 and a2 affect the agent's total contribution to firm value." Further on, he says: "To induce the agent to choose first-best actions, a contract must create incentives that match the marginal social benefits." But Baker argues that this is often impossible in practical terms. To exemplify, Baker raises a trivial hypothetical scenario: […] suppose that (p) is the sum of a1 and a2, but that (y) is the sum of a1 and twice a2. In a broad class of such examples, no contract can cause the agent's incentives to match the marginal social benefits of the agent's actions."

Lazear (1989) is highlighting another dimension not yet accounted for, raising the question regarding how to categorize incentives and how each category of incentive should be treated. Deriving from Lazear and Rosen's (1981) tournament model, he allows the agents only two sets of actions when attempting to win the tournament: effort and sabotage. He argues that: "A big prize for winning the tournament induces not only a great deal of effort but also a great deal of sabotage, so the efficient prize level is smaller when sabotage is possible than when effort is the only action agents can use in attempting to win the tournament". Lazear effectively divides incentives into two main categories: "weak" and "strong" incentives. Along these lines he also introduces "functional" and "dysfunctional" incentives. There are several more nuances that could be accounted for, but in this context, we are neglecting them. One of Lazear's main points is that weak incentives are preferable too strong incentives when categorized as dysfunctional.

Holmström and Milgrom (1991) takes it a step further, developing other models accounting for these phenomena. A few of these models consider measured performance and reject important dimensions of "total contribution". For instance, consider a situation where action a1 accounts for a part of the contribution not only the alternative performance measure (p) but also (y). Further on, consider that action a2 contributes only to (y) and nothing at all for (p). In this scenario it is evident that a contract tied to such performance measures will motivate the agent to ignore action a2 simply because he will receive less wages, despite if action a2 increases the agent's total contribution to firm value.

Conclusively, with his model, Gibbons amongst other showcase that the classic tradeoff between risk and incentives has some explanatory power. Although, some literature, like Kole (1997) display its variation in explanatory power in different contract forms, proposing that the tradeoff between incentives and risk is far from all that matters when trying to give sense to human incentivizing in an organizational context. With theoretical support from Baker, Lazear and Holmström/Milgrom we provide some theoretical framework for further discussion.

2.1.2 Compensation and incentives: Practice vs. Theory (Baker, Jensen & Murphy, 1988)

The next theory we will look at is that of how compensation and incentives work in practice and in theory, by George P. Baker, Michael C. Jensen, Kevin J. Murphy. This theory provides a deeper dive into aspects of current economic theory and actual practice seems particularly disassociated, while looking at evidence that are inconsistent with economic theories. The goal of this model/theory is to try and implement typically non-economic explanations, such as notions of fairness, morale, equity, trust, social responsibility and culture, into the traditional economic model (Baker et al, 1988). The purpose of this implementation is to enlighten the differences of economic theory and actual practice, thus giving an explanation to the differences that occur. We will focus on the first part of this paper, including the absence of pay-for-performance compensations systems and the objective and subjective performance measurement.

2.1.2.1 The absence of pay-for-performance compensation systems

The paper starts off by stating that most individuals prefer monetary rewards, because the money in itself represents a generalized claim on resources (Baker et al, 1988), and that the

general assumption that higher performance requires greater effort from the worker. Thus, hard-working employees should be compensated more than the average employee. However, research shows the financial rewards, as performance-based bonuses, very rarely account for an important part of an employee's compensation (Baker et al, 1988). Table 1 illustrates the results of Medoff and Abraham (1980), in their research of the pay of managerial and professional employees in two manufacturing firms, A and B. The results shown indicate how little superior performance affected earnings (Baker, 1988).

Table 1: *Salary premium associated with performance ratings (Medoff and Abraham, 1980)*

Salary Premiums Associated With Performance Ratings, and Frequency Distribution of Performance Ratings, for 7,629 Managers in Two Large Manufacturing Firms

Performance Rating	Salary Premium Relative to Lowest Performance Rating	Percent of Sample Receiving Performance Rating
(1)	(2)	(3)
Company A (4,788 managers):	%	%
Not Acceptable	-0-	.2
Acceptable	1.4	5.3
Good	5.3	74.3
Outstanding	7.8	20.2
Company B (2,841 managers):		
Unacceptable	-0-	-0-
Minimum Acceptable	-0-	-0-
Satisfactory	-0-	1.2
Good	1.8	36.6
Superior	3.6	58.4
Excellent	6.2	3.8

From the table we can see that the employees in company A rated as "outstanding", are only paid 7,8 % more than those rated as "not acceptable". Additionally, 94,5 % of the total employees are rated as either good or outstanding. Similar results are shown for company B, where the salary premium for a rating of "excellent" only provides a 6,2 % salary increase. In company B, 95 % of the employees are rated as either "good" or "superior" (Medoff, 1980).

The take from the research of Medoff and Abraham (1980) is that while many companies claim to pay for performance, much of the pay doesn't seem to be directly tied to performance itself. Most employees are rated relatively good, while the pay for such ratings is fairly small in comparison to other ratings.

A. Is pay an effective motivator?

The authors move forward by looking at why companies don't to a greater extent utilize bonus systems based on actual performance. Some explanations can be found from a non-economic standpoint, stating that money as a motivator for performance can be counterproductive (Medoff, 1980). On one side, money can reduce intrinsic rewards that employees might receive from a particular job (Deci, 1972). Similarly, Alfie Kohn (1988) in his paper "Incentives can be bad for business" gives three reasons to why pay for performance systems is counterproductive (Kohn, 1988):

1. Rewards encourage people to narrowly focus on a task, do it as quickly as possible, and take few risks
2. Extrinsic rewards can erode intrinsic interest
3. People come to see themselves controlled by a reward

Merit-pay can also induce unwanted side effects that could turn costly to both employee productivity and morale (Medoff, 1980). One of these side effects could be distrust in the organization's horizontal equity. There lies a fundamental law that employees should be treated both fairly and equally (Medoff, 1980). However, merit-pay demands distinction between employees based on performance, and therefore it is quite difficult to treat employees both fairly and equally.

Medoff et al. argues that pay-for-performance systems might be too effective, making employees do exactly what they are told, removing risk and creativity, and bringing along adverse side-effects, much because it is hard to perfectly specify exactly what employees should do and measure the correct performance (Medoff, 1980).

B. Objective vs. subjective performance measurement

Pay-for-performance systems can be based on both subjective or objective measures, or a combination of the two (Medoff, 1980). Some jobs, such as sales, tend to be based on objective measures, because performance in these areas is more easily observed. In most jobs, however, performance isn't as easily measurable. Joint production and other unobservable factors in production measure an employee's output insufficient. Medoff (1980) proceeds to list objective disadvantages, including employee's tendency to "gaming the system", optimizing measures of the merit-pay, rather than optimizing intended measures. Examples of such

behavior is given by piece-rate workers, who will sacrifice quality of quantity, or managers sacrificing long-term profitability for short-term earnings to maximize profits. Objective performance measurements are also hard to change without disappointing employees, giving an impression of unfair treatment (Medoff, 1980). Another conflict appears when technological or other advances increase production efficiency, making merit-pay easily achievable. Employees then have an incentive to withhold this information in order to more easily achieve certain goals or stop working efficiently after a certain goal is met. Similarly, specifying correct objective measures is often impossible for the principle (Medoff, 1980).

The alternative, subjective measures, accompany its own set of problems, and are not preferred by supervisors in an organization (Medoff, 1980). Subjective measures depend on a high degree of trust between the principal and agent, and as Edward E. Lawler (1971) describes: "The more subjective the measure, the higher the degree of trust is needed, because without high trust there is little chance that the subordinate will believe that his pay is really fairly based on performance". Similarly, principals tend to prefer not to utilize subjective measures to avoid conflicts or having to justify their assessment of performance (Medoff, 1980).

In the construction industry, with regards to a higher focus on sustainable effort, it could be difficult to measure and compare how employees (agents) weigh the sustainability element in upcoming projects. Subjective performance measures could then be an easier way of considering how different employees focus on sustainability during negotiations with builders, and their general attitude towards sustainability.

Summarized, there are disadvantages to both objective and subjective measures of performance evaluations. The lack of trust and desire to avoid conflicts lead organizations to avoid subjective evaluation, while the difficulty of setting correct objective measures lead to organizations avoiding objective measures. Thus, the compensation system ends up being one of little or no pay-for-performance at all (Medoff, 1980).

2.1.2.2 Biased and inaccurate performance evaluations

In section I in Medoff et. al. we could read from table 1 that supervisors have a tendency to rate employees uniformly (Medoff, 1980). A seemingly avoidance of rating employees poorly is consistent with field evidence regarding how employees view themselves relative to their colleagues. For instance, 83 % of managerial and professional employees rated their performance to be in the top 10 %, while no one rated themselves to be below the 75th

percentile (Meyer, 1975). This might help explain why pay-for-performance in organizations is hard to find. Giving evaluation that conflicts with the employee's own self-assessment is bound to create dissatisfaction and conflicts. Similarly, telling everyone that their average makes no one happy, thus leading to evaluations being overly leaned to the above average side.

An experiment conducted on the University of Rochester business school faculty members looked at a similar situation of performance evaluation, where these members were to evaluate and reward their secretaries' bonuses based on performance (Medoff, 1980). The first year of the experiment the maximum bonus was set to $150, and the second year the bonus was set to $250 each quarter. During the first year, 90 % of the secretaries received the maximum bonus, and no one received less than $100. The second year however, only 59 % of the secretaries received the maximum bonus, and the variance of rewarded bonus was substantially higher (Medoff, 1980). Over the two yearlong experiment, 76 % of the secretaries were awarded the highest bonus, indicating that, in general, the faculty members were reluctant to give poor evaluations (Medoff, 1980). Another important result is that of the decrease in maximum bonus rewarded when the stakes get higher, suggesting that higher stakes accompany better evaluations.

Biased and inaccurate performance evaluations reduced the effectiveness of incentives in an organization, thus indirectly reducing productivity (Medoff, 1980). Low stakes induce little effort in executing proper valuation, and in the reluctance of giving poor evaluations to avoid conflict and dissatisfaction, most employees are evaluated higher than average with little variance. This results in small bonuses and ineffective incentives. Higher stakes counter this, incentivizing organizations to invest more resources in evaluations and performance measurement (Medoff, 1980).

2.1.3 Incentives and Prosocial Behavior (Bénabou and Tirole, 2006)

To complement and bring into view another dimension of organizational behavior we introduce the theory about prosocial behavior and incentives extended by Bénabou and Tirole (2006). While Gibbons (1998) broadly discusses organizational incentivizing in an instrumental matter, Bénabou and Tirole supplement the theoretical framework by examining a more effective side of human incentivizing. The main property of their theoretical framework is that agents' prosocial or antisocial behavior reflects an endogenous and unobservable mix

of the three mentioned motivations: intrinsic, extrinsic, and reputational. This behavior should be deduced from the agents' choices and the context they operate in. Bénabou and Tirole obtain four main sets of results, but we will exclude the fourth due to its relevance.

2.1.3.1 Rewards and punishments

Firstly, they argue that: "the presence of extrinsic incentives spoils the reputational value of good deeds, creating doubt about the extent to which they were performed for the incentives rather than for themselves." This phenomenon has been called "overjustification effect" by psychologists (Mark Leppner et al, 1973). In essence, it implies that an external incentive decreases the agent's intrinsic motivation to perform a particular behavior or participate in an activity. For instance, imagine that the kids at a kindergarten are allowed to play with toys during their free time. In the alternate scenario where the caregivers are giving the children a reward for playing with the toys, they may actually start to feel less intrinsically motivated to continue to play with these toys. Formally, external motivators could act like a noise and create a signal-extraction problem. This could be explained through Frey and Jegen's (2010) informal explanation: "An intrinsically motivated person is deprived of the chance of displaying his or her own interest and involvement in an activity when someone else offers a reward or orders him/her to do it."

Furthermore, Bénabou and Tirole touch on the point that the eminence of contributions in groups strengthens an agents' signaling motive, bringing another nuance to organizational incentivizing. Meanwhile, when the agents are heterogeneous in their image concerns, actions firstly perceived as good could be viewed as actions motivated mainly by appearance. The intuition of this is that motivational rewards such as public praise (and shame) would have limited impact.

Thirdly, they highlight the importance of social and personal norms, arguing that: "the inferences that can be drawn from a person's actions depend on what others choose to do, creating powerful spillovers that allow multiple norms of behavior to emerge as equilibria". The general thought intuition is that individuals' decisions are set in a strategic context and work as strategic complements or substitutes. Their decisions are dependent on whether the individuals' reputational concerns are dominated by either the avoidance of stigma or the pursuit of distinction. Bénabou and Tirole argue that the first case appears when there are few types with low intrinsic consideration, as well as when valid excuses for not participating are

more rare than other events that make participation inevitable. While the second case relates to the opposite circumstances.

2.1.4 When and why incentives (don´t) work to modify behavior (Gneezy, 2011)

As viewed by Gibbons (1998) incentives are proven to have an effect on behavior, and that they matter. The basic "law of behavior" is that when introduced with higher incentives, individuals will put in more effort and higher performance (Gneezy, 2011). For many cases this law holds true, however, it is equally important to recognize certain instances where monetary incentives can have an additional effect on behavior, explored by Uri Gneezy, Meier and Pedro Rey-Biel. In their paper the authors explore how extrinsic incentives may come into conflict with other motivations, and thus reduce already existing intrinsic motivation. In this section we present the relevant topics from their paper; "when and why incentives (don´t) work to modify behavior". This paper looks particularly into the use of incentives in behavioral interventions, their effect on performance.

2.1.4.1 The potential crowding-out effect versus extrinsic incentives

Monetary incentives have two kinds of effects, the first one being the direct price effect (Gneezy, 2011). The direct prize effect is the direct effect the monetary incentive has on the receiving end, making the incentivized behavior more attractive. An example of this is when an employer pays an employee more per unit produced, making the quantity of production more attractive to the employee. The second effect is known as the indirect psychological effect (Gneezy, 2011). To put in other words, the monetary incentive is perceived by the incentivized individual. This effect can, in some cases, work against the price effect, and thus crowd out the initial incentivized behavior.

To better understand the physiological effect, it can be useful to use the Benabou and Tirole (2006) model, where individuals have a utility function including three components: They value extrinsic rewards, enjoy doing an activity and care about their image (Benabou, 2006). They care about their own image and reputation, and they care about how others perceive their image and motivation.

Information is one channel which affects agents´ decision about effort (Benabou, 2006). One example is when an incentive is introduced, it could signal that the principal views the task as difficult, or not well suited for the agent, and thus lower the intrinsic motivation the agent had

to undertake that specific task (Gneezy, 2011). Another example could be that the agent views the incentive as a signal of mistrust, and thus again reduces the intrinsic motivation.

Another channel for crowding out appears when the extrinsic rewards negatively affect the agents image motivation and reputation (Gneezy, 2011). Undertaking a task may be viewed as motivated by greediness, as opposed to the previous intrinsic motivation before the monetary incentive was introduced.

2.1.4.2 Crowding out in the short run and when incentives are removed

There is plenty of research in the field of crowding out effects on intrinsic motivation, starting in the 1970´s. One example given on how information provided through monetary incentives can be found through Frey and Oberholzer-Gee (1997). Members of a community were offered large monetary compensation for allowing a nuclear waste site presence in proximity to their community. The incentive was to work as compensation for the inconvenience but was received as a token on how risky this nuclear waste presence could be. Thus, community members were less inclined to accept the nuclear waste plant.

Another example is shown by Gneezy and Rustichini (2000). By offering high school students who collected donations for charity in a door-to-door fund-raiser a small compensation, the effort went down. This proves that the small compensation given crowded out the intrinsic motivation these students had in the charity work and led to lower effort in the short run.

As previously mentioned, incentives may alter how the agents view their respective tasks, and in some cases lower their motivation for undertaking certain tasks. This effect can be extended permanently in the long run, even after the incentives are removed (Gneezy, 2011).

One interesting example of this is provided by Gneezy and Rustichini (2000). In this experiment, a daycare in Israel began charging parents a small fine (about $3) for parents picking up their kids late. One would think this fine would help encourage parents to arrive on time, but the fine had the opposite effect. An explanation of this could be that previously, the parents didn't know the importance of arriving on time. This small fine would now put a price on the lateness, and with time being so small, it was viewed as a minor inconvenience. An interesting point in this experiment was also shown when the fine for late pick-ups was removed. The information provided by the small fine, that late pick-ups weren't important, had already been communicated, and parents in this experiment were more likely to pick up their kids later than the parents in the control group (Gneezy, 2000).

2.1.4.3 Incentives for prosocial behavior

The term prosocial behavior includes voluntary contribution to public goods, such as donating blood, protecting the environment and volunteering (Gneezy, 2011). Previously we´ve viewed examples of when monetary incentives have negatively affected contribution to public goods, but there exist also examples of when incentives do not have this negative effect. Going forward in their paper, Gneezy, Meier and Pedro Rey-Biel (2011) look at when incentives do and do not work.

In the field of prosocial behavior, trust is often an important factor (Gneezy, 2011). In principal-agent relationships, Ellingsen and Johannesson (2007) found that agents tend to put in higher effort than the enforceable levels of effort if the principals show trust towards the agent. Similar results are found in Fehr and List (2004) trust game, as well as Fehr and Gatcher (2002).

Together these findings conclude that control is often viewed as a signal of distrust, making agents react negatively to it. It is important to recognize whether the contribution to public goods is trust-related between the parties involved. If the incentive to encourage contribution to public goods shows a sign of distrust, the effectiveness of the incentive might be ineffective (Gneezy, 2011).

2.1.4.4 Incentives frame social interactions and affect social norms

To look upon the incentives and how they affect social interactions and social norms Gneezy, Meier and Pedro Rey-Biel (2011) provides a thought experiment aimed to facilitate how incentives can be perceived. In this thought experiment they imagine meeting an attractive person, telling him or her: “I like you very much and would like to have sex with you”. The results of this statement can be varied. Now they add an incentive to the statement: “I like you very much and would like to have sex with you, and, to sweeten the deal, I´m also willing to pay you $20!” (Gneezy, 2011). Even though the deal is in essence the same, with a monetary incentive, the statement will not likely be received as intended. However, if one changes the incentive of the $20 dollars to $20 dollars’ worth of flowers. The monetary value is the same, but the message communicated is quite differently received by the person offered the deal. This thought experiment shows how incentives can be viewed and presented in different, effective and ineffective ways.

Another important motivation to contributing public goods is image concern (Gneezy, 2011). Intrinsic motivation can be simply a desire to show people that you are a nice person. Introducing extrinsic incentives can directly crowd out this intrinsic motivation. It then becomes unclear to others whether someone contributes because they are "nice", or because they want the potential extrinsic reward offered.

Ariely, Bracha and Meier (2009) conducted an experiment where individuals could make donations to charitable organizations, either publicly or privately, incentivized or not. The experiment found that incentives work well when the individual decides to donate in private but crows out the prosocial behavior when the individual decides to donate publicly. This implies that paying incentives such as these should be done in private rather than in public, to not crowd out the intrinsic motivation and avoid having the reduced effect on image motivation (Gneezy, 2011).

Gneezy, Meier and Pedro Rey-Biel conclude their paper with the fact that incentives do matter, but in various and sometimes unexpected ways. The paper shows how monetary incentives can negatively affect effort by crowding out intrinsic motivation, be it image, reputation, trust, social norms, or the desire to "be nice". Some of these effects may last even after the monetary incentive is removed. Conclusively the authors point out that when considering monetary incentives as motivation, one must focus on broadening the focus (not just have an economical view), how they are designed, the form of which they are given (monetary or nonmonetary), how they interact with intrinsic motivation and social motivation and what happens when they are withdrawn (Gneezy, 2011).

As sustainability, and environmentally friendly solutions, become increasingly popular in the eyes of the public, public praise and meeting their expectations also becomes an important achievement for a company. This will reflect in how the company structures and operates. If the focus on sustainability comes from these expectations, and with the intention of being viewed as "green" and responsible, monetary incentives would risk minimal impact.

2.2 Circular Economy Theory

2.2.1 Circular Economy: The Concept and its Limitations (Korhonen et al, 2018)

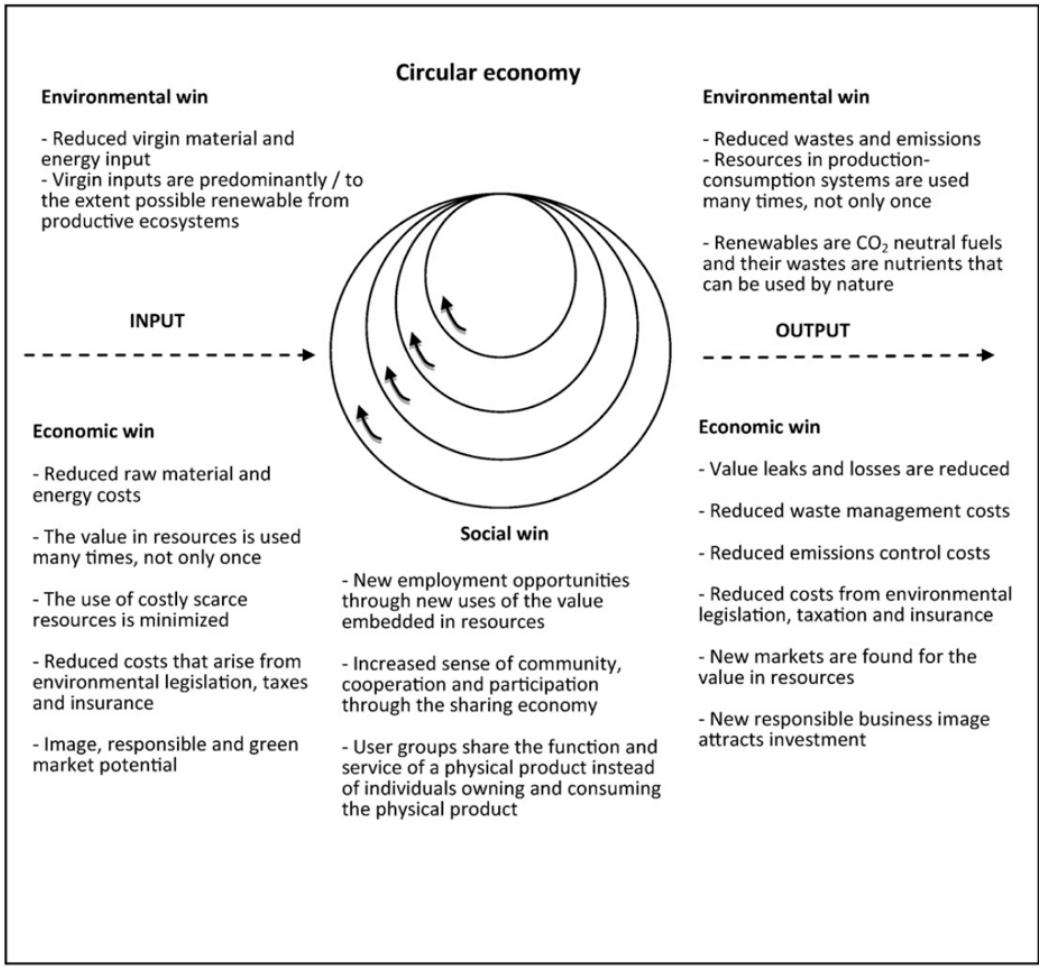
Despite the surging popularity in the research on circular economy (CE), and the fact that it is being promoted by key policy makers in the EU, several national governments (among others Norway) and businesses all over the world, the scientific content of the CE concept could seem unorganized and fragmented. Korhonen, Honkasalo & Seppälä (2018) argue that CE: "[…] seems to be a collection of vague and separate ideas from several fields and semi-scientific concepts." Furthermore, they argue that the concept of CE almost exclusively has emerged from practitioners rather than from the scientific community, from the likes of policymakers, businesses, business consultants, business associations etc. (see e.g., EMAF, 2013; COM, 2014; CIRAIG, 2015). The intent with their paper is thus to shed light on this and bring a scientific view on CE. Firstly, they give a scientific definition of the CE concept, before they highlight some practical and theoretical limitations of the CE concept.

2.2.1.1 Circular Economy for Sustainable Development: Toward a New Scientific Definition

Korhonen, Honkasalo & Seppälä (2018) list several scientific fields that have influenced the (fragmented) theoretical framework that has made up the CE concept, like industrial ecosystems, cleaner production, biomimicry, natural capitalism, and others, but underline that the most relevant background concepts probably stem from cradle-to-cradle concept of "eco-effectiveness" and industrial ecology. Combining these concepts, they suggest the following new definition for CE:

"Circular economy is an economy constructed from societal production-consumption systems that maximizes the service produced from the linear nature-society-nature material and energy throughput flow. This is done by using cyclical materials flows, renewable energy sources and cascading-type energy flows. Successful circular economy contributes to all the three dimensions of sustainable development. Circular economy limits the throughput flow to a level that nature tolerates and utilizes ecosystem cycles in economic cycles by respecting their natural reproduction rates."

Figure 1: *Conceptual theoretical framework of Circular Economy: input vs. output (Korhonen et al, 2018)*



2.2.1.2 Background

Cradle to Cradle: Remaking the Way We Make Things (Braungart & McDonough, 2002)

Braungart and McDonough (2002) discard the current production practices of "eco-efficiency" in favor of their own term of environmentalism; "eco-effectiveness". In the authors' view, industry (and its production) should be modeled after nature, meaning that all byproducts of the production processes, from the products they produce to the people they employ, should complement, and enhance the environment. Their main example involves the one with trees: "[…] everything they produce, every byproduct, is good for the organisms around them. With trees, there is no waste that goes to a landfill." According to the authors, the notion of the "eco-effective" model should follow the example of the trees. Moreover, the researchers debunk what they classify as misinformation surrounding "good" environmental practices (e.g.,

recycling) and dismiss popular beliefs about the interaction between the industry and the environment. Additionally, they introduce the term cradle-to-cradle, which refers to a systematic shift in production and consumption and an alignment of industrialist and environmentalist goals. Rather than "cradle-to-grave", the researchers maintain that producers should adopt a "cradle-to-cradle" life cycle. In other words, a product's life cycle should not end in a "grave", but rather design and produce with new uses already in mind.

2.2.2 On the Concept of Industrial Ecology (Graedel, 1996)

To accompany Korhonen, Honkasalo & Seppälä's definition of the CE concept they present the scientific research field of industrial ecology. Graedel (1996) untangles what lies beneath: "The term industrial ecology was conceived to suggest that industrial activity can be thought of and approached in much the same way as a biological ecosystem and that in its ideal form it would strive toward integration of activities and cyclization of resources, as do natural ecosystems". Graedel's purpose with this paper is to conceptualize the connection between ecology and ecosystems from a biological point of view, with the one of human industrialism. No biological ecosystem is without the influence of humans and vice versa. A constructive way of departing in the area of industrial ecology could be to graphically depict which kinds of ecosystems there are. He argues that there are three types of ecosystems: "Type I", "Type II" and "Type III".

A "Type I" system is characterized by the fact that biological systems have an unlimited supply of resources, and where the flow of materials necessarily was independent of any other flows. Such a system could be considered linear in fashion and could in theory produce unlimited waste. This system is considered to derive from the early stages in Earth's history. As early life forms developed and multiplied in number, it began setting natural constraints on the resources available. An alternative linear material flows arose, in types of resource cycling, in total limiting the inflows and outflows of the system. This is expressed as a "Type II" system (or a quasicyclic system).

The depictions of "Type I" and "Type II" systems refer to sequential ecosystems. A "Type I" system, also coined as an open system, serves as a contrary to the "Type II" system which is coined as a closed system, with respect to how the inflows and outflows of the system behave: A "Type I" system treat the inflows of resources as merely a mean of activities, while a "Type II" system treat the inflows as an integrated circuit and further treat the ecosystem as a whole

rather than something that acts in an isolated manner. To complicate it further, an ecosystem could consist of both open and closed resources. While a "Type II" system is more coherent than the one of a "Type I" system, one would not consider it to be an inherently sustainable one over a long term. In an effort to become fully sustainable, Graedel argues for a model that achieves full circularity, and introduces a "Type III" system.

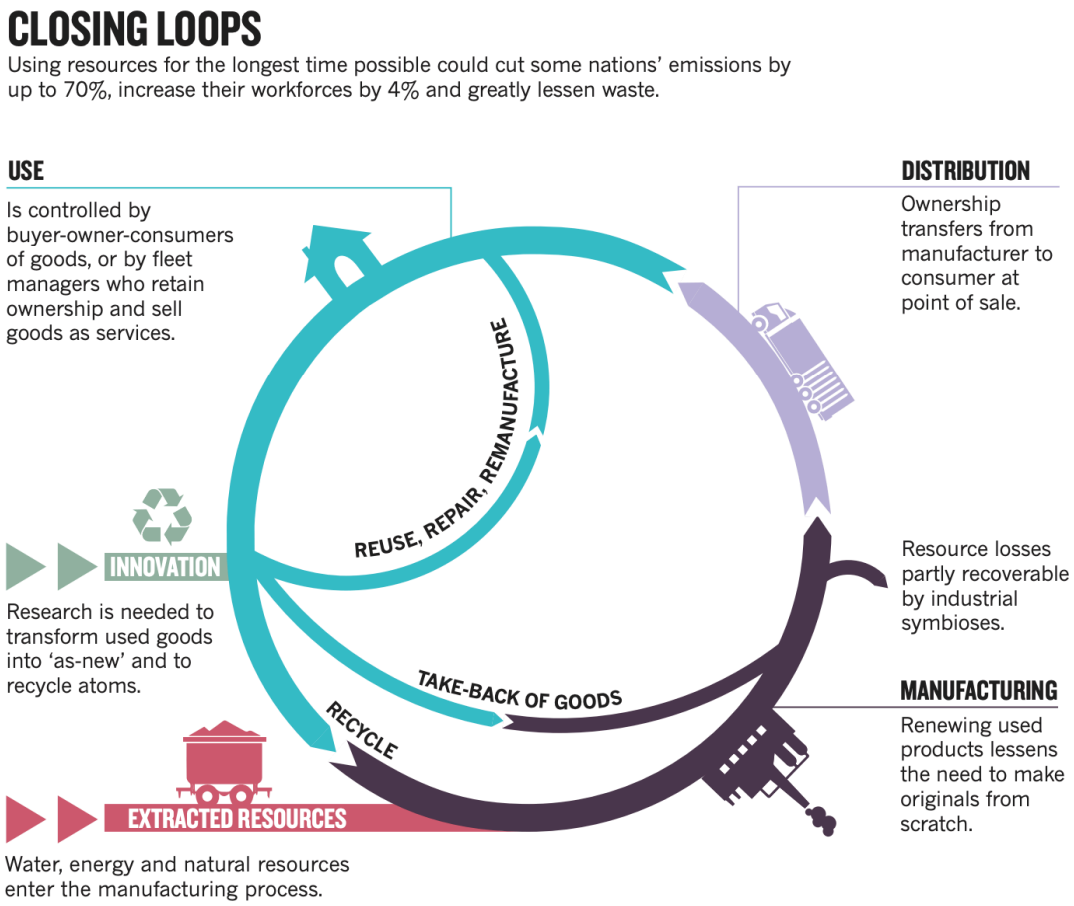
2.2.3 The Circular Economy (Stahel, 2006)

As discussed above, circular economy as a concept could be perceived as somewhat unclear due to it seemingly being a cross-section between several theoretical frameworks and subsequent subjects. That is why we will make an attempt to highlight what lies beneath the term and try to decipher the main messages to get a clearer image of what it really is. The concept derives from the idea of substituting manpower for energy, first presented in a report to the European Commission by Stahel and Genevieve Reday-Mulvey in the 1970s. Although the report does not necessarily cover everything Stahel is advocating for CE today, Stahel (2006) argues that behavioural economics is root for one of the most relevant points for departure and underlines the importance of CE as a societal trend in a "system thinking-perspective".

The backdrop for this theoretical thought brings him to explain that there are three kinds of (industrial) economy: linear, circular and performance. He underpins the fundamental difference between a linear approach to economics (and the resources related to it) and a circular approach, as well as to describe what characterizes a performance economy. A linear economy traditionally follows a "take-make-dispose" step-by-step plan. In this approach you collect resources (such as raw materials), transform them into products that are being used until they are finally discarded as waste. One of the main characteristics in this approach is that the actors in the economy (like producers and consumers) are treating resources as something inherently independent and one is to use these resources in isolation, not as a part of a bigger system. Value-creation is based upon producing and selling as many products as practically possible. Stahel uses an analogy to emphasize: "A linear economy flows like a river, turning resources into base materials and products for sales through a series of value-adding steps". He continues: "It is efficient at overcoming scarcity, but profligate at using resources in often-saturated markets". Hence, Stahel promotes an alternative approach trying to cope with the challenges in the linear approach-model and thus introducing a CE-approach. A CE treats the processes in conjunction with production of goods and services in the economy

as, quite literally, "circular", rather than linear. In this lies a precondition that the sum of all production-processes is a loop. Consequently, an essential principle in CE is to close these loops. Stahel (2006) elaborates: "This […] changes economic logic because it replaces production with sufficiency: reuse what you can, recycle what cannot be reused, repair what is broken, remanufacture what cannot be repaired". It has a regenerative outlook, calling for reprocessing goods and materials while reducing resource consumption and waste. In contrast to the linear approach, CE targets to maximize value at each point in a product's life and set each process into a broader picture emphasizing that resources and the processes where they are being used are a part of a system.

***Figure 2**: Conceptualization of Circular Economy in practice: closing loops (Stahel, 2006)*



A performance economy takes the main principles from the circular approach and goes a step further by selling goods as services through rent, lease and share business models. Instead of giving the consumer the property rights to the goods, the producers hold on to the ownership

of the product. This creates a different dynamic as it is now the producer that carries the responsibility for risks and costs related to wastage from the products. Service-related business models, as opposed to product-related business models, bring more flexibility because it free the users from maintaining the products and ownership-related challenges. There are numerous examples of such services: “power by the hour” for jet and gas turbines, bike and car rentals, laundromats, and others. In this situation the producers (the ones providing the products used in the services) have an incentive to maximize the lifetime-value for each product.

2.2.3.1 Achieving the circular economy

To create this, we need a shift in policy making - from solely focusing on protecting the environment to incentivizing and promoting sustainable business models that are based on full ownership and accountability and encourage businesses to create business models that are unlimited in time. This presupposes an attitude-change in the way producers and consumers think about the economy (and how goods relate to this ecosystem). In addition to producers and consumers, Stahel (2006) argues for policymakers’ role in this system thinking perspective. He asserts that policymakers have a certain responsibility regarding when setting which measurements are to be used when measuring value-creation in the economy, and subsequently incentivizing businesses and consumers. Stahel (2006) argues that instead of using ratios like GDP as a measurement on value-creation, policymakers should use “resource-miser” measurements such as value-per-weight and labour-per-weight.

2.2.4 The circular economy - A new sustainability paradigm? (Geissdorfer, Savaget, Bocken & Hultink, 2017)

The concept of the circular economy has recently gained a lot of attention as a tool to address sustainability issues in today's economy. Such advances towards a more circular economy can be seen in Europe with the European Circular economy package (European Commission, 2015) and in China with the Chinese Circular Economy Promotion (Lieder and Rashid, 2016). However, it can be difficult to distinguish the terms of circular economy and sustainability. The paper “circular economy – a new sustainability paradigm” by Geissdoerfer et al. explores the similarities, differences and relationship between the two terms. Their paper formulated two research questions to investigate the gap between the two terms, we will be focusing on the first one:

RQ 1: What are the main conceptual similarities and differences between sustainability and the Circular Economy? (Geissdoerfer, 2017)

2.2.4.1 Sustainability and the circular economy

The term sustainability has become an increasingly incorporated term in the strategy of companies and agendas for policymakers (Geissdoerfer, 2017). Johnston et al (2007) estimated around 300 different definitions of sustainability. Some definitions stem back to the early 18th century, describing how wood harvesting should not exceed the volume which prevents it from growing back again (Von Carlowitz, 1713). These all lead up to today's definition "able to be maintained at a certain rate or level" (Dictionary, 2010).

Sustainability has gotten increased attention as a result of increasing evidence of global environmental risk, climate change, biodiversity loss and ozone depletion to name a few (Geissdoerfer, 2017). A major step towards a global understanding of the concept came with the Brundtland Commission of 1987. This commission defined sustainability as "Development that meets the needs of the present without compromising the ability for future generations to meet their own needs" (Brundtland, 1987).

Even though the circular economy has gained momentum the last five to ten years, it's not an entirely new concept. In 1976 Stahel and Reday research on industrial economy introduced certain features that are common in the circular economy. Stahel and Reday conceptualized a loot economy in order to prevent waste generation, regional job creation and resource efficiency (Geissdoerfer, 2017). Later, in 1982, Stahel also proposed the idea of lending utilization instead of ownership as a sustainable business model, allowing companies to profit without risk associated with waste and externalizing costs (Stahel, 1982).

There are many definitions of the circular economy. Common among these are the focus on closing the loop on material flow, with an aim to keep products, components and materials at their highest utility av value (Geissdoerfer, 2017). Geissdoerfer et. al. combines many of these definitions, and define the circular economy: "... as a regenerative system in which resource input and waste, emission, and energy leakage are minimized by slowing, closing and narrowing material and energy loops. This can be achieved through long-lasting design, maintenance, repair, reuse, remanufacturing, refurbishing and recycling". If exemplified in the construction industry, new projects would be built with the ability to reuse materials to a high

degree as possible, enabling a simpler deconstruction process to reuse concrete and other materials for new projects.

Sustainability and the circular economy share quite a few similarities. They are global in their nature, focus on consumption without jeopardizing future needs, sharing concerns with the current state of technology and exploring potential competitive advantages (Geissdoerfer, 2017). Despite these similarities, sustainability is viewed as a more open-ended concept than the circular economy, which on the other hand is more of a concrete example of how a sustainable economy can look like. To emphasize the similarities, differences and relationship between the two terms Geissdoerfer et. al. aims to promote social inclusion, economic prosperity and environmental resilience (Geissdoerfer, 2017).

In order to analyze the research question: "What are the main conceptual similarities and differences between sustainability and the Circular Economy?" Geissdoerfer et al. conducted bibliometric research, a form of meta-analytical research of the literate (Kim and McMillan, 2008). This method analyzes published data, measuring its context, such as citations, affiliation and keywords (Geissdoerfer, 2017). The data collected was from English published articles, published after 1950 containing the words "Circular economy", "sustainability" and "circular economy AND sustainability".

2.2.4.2 Similarities and differences

There are several similarities between the circular economy and sustainability, making them difficult to distinguish. They have both a global perspective, focusing on global problems, shared responsibility and a need for coordination between agents in order to face these problems. Both focus on new system design and innovation in order to solve these problems and reach their ambitions (Geissdoerfer, 2017). Cooperation between stakeholders is imperative in order to succeed, therefore both concepts rely on regulation and deliberate design of incentive structure (Geissdoerfer, 2017). In order to face these problems both concepts have business model innovation as a key part to succeed.

As for differences, sustainability is a far older concept than circular economy. Furthermore, according to literature the two concepts have quite different goals associated with them (Geissdoerfer, 2017). While the circular economy focuses on closing the loop, drastically reducing resource input, eliminating waste and emission leakages, sustainability has a far more open-ended goal (Geissdoerfer, 2017). The circular economy focuses on how the standard

make-use-dispose system of today's economy could be altered into a circular model, where resources could be better used, waste reduced and reused to lighten the resource input required in production. Sustainability focuses more on concrete measures of how each business can be more sustainable. As for agency the concepts also differ, with sustainability agency being more diffused, the circular economy has a clear emphasis on companies and governments (Webster, 2015). The two concepts have quite a different time frame, with sustainability being more open-minded, where goals can be reframed over time and constantly adapted, while the circular economy includes theoretical limits to implementations in order to succeed in its implementation (Geissdoerfer, 2017).

2.2.5 The Circular Economy: What, Why, How and Where (Ekins et al, 2019)

2.2.5.1 Barriers to and drivers of a circular economy

It can be inferred from the previous sections that there are drivers for CE practices which are causing or warrant them to occur in particular conditions. At the same time, there are also barriers which restrict wider adoption of these CE practices. To gain traction, Ekins et al (2019) argue that we need to examine both drivers and barriers in conjunction with CE to obtain a coherent platform which suggests measures to enhance CE adoption, by removing barriers and better the drivers. A useful distinction when discussing barriers and drivers, is between those that are internal, and those that are external. In this distinction lies a presumption that internal barriers and drivers reflect relationships that are within individuals' and organizations' control, while external barriers and drivers are not. The authors argue that the internal ones include the strategies and decisions made by the individuals in an organization or the organization itself. While external drivers and barriers reflect the context in which organizations or its individuals operate, and as such has less direct influence over such factors.

Of the listed external barriers that companies might encounter, inconsistent policies and messages, and lack of clear pricing signals, are challenges that are best suited to be tackled by policy makers rather than producers (and to an extent consumers). While other barriers such as supply chain constraints, and thresholds in technologies and infrastructure capacity, may warrant more direct interactions from producers.

Further on, Ekins et al use the figure to draw the line towards barriers that are considered more internal and continue: “business and commercial model, knowledge and expertise, competing priorities, internal capacity and resources, habitual behavior, negative attitudes and cultures, are all things which it would be within the remit of a company to improve or resolve within its own organization”. They are implying that these matters are in the hands of each organization, but claim, however, that the motivation is determined by external factors. In the case of lack of consumer demand (i.e., designed for the purpose of being recycled or remanufactured) – or if barriers such as policies or pricing signals are missing, the organization would evidently have limited incentives to get rid of its internal CE barriers, apart from the event where these same barriers also happen to be barriers to profit.

To intensify the changeover from linear to circular economy, the authors consider behavioral economics. It is particularly interesting that the model calls attention to incentives to invest, underlining the importance that it has, due to it being in the crosshairs between external and internal barriers. Broadly used classical theories often assume fully rational and self-interested economic agents, not fully accounting for the complexity in human behavior and the mechanisms that lay behind why humans do what they do. Often do individuals deviate from this presumed self-interest and rationality, breaching a lot of these classical theories about behavioral economics. Ekins et al (2019) elaborate: “Behavioral economics have identified deviations with respect to preferences (time inconsistency, the effect of social preferences and altruism, reference dependence, incorrect probability weighting), beliefs (individuals project current preferences into the future) and decision making (the effect of framing, inertia, limited attention and use of heuristics)”. A holistic point of view between psychology and economics as in behavioral economics is necessary to gain a comprehensive understanding and can lead to better predictions of economic behaviour. The barriers are tied together – they don’t operate in isolation; barriers such as high upfront cost, low returns on investment and limited access to capital are all related to policy changes and lack of clear pricing signals for instance. Seemingly, a limited amount of the theory surrounding CE consider the human (and thus organizational) behavior that is necessary for CE practices to gain traction, emphasizing the need for more research in the field.

Diaz Lopez et al. (2019) examine relationships between resource efficiency measures, CE business model changes, and implementation barriers and adopt a categorization of implementation barriers (as shown in Table 2).

2.2.5.2 Main categories of implementation barriers for resource efficiency

Table 2: *Illustration of conceptual barriers for resource efficiency in a Circular Economy context (Ekins et al, 2019)*

Barrier type	Definition	Examples
Institutional	Barriers caused by (e.g. political) institutions framing the "rules of the game".	Regulations and laws, fiscal measures, conditions for investment
Market	Market conditions, economic climate, and value network conditions	Monopolies, lack of information, subsidies, supplier leverage, relative cost of labour, materials and energy, etc.
Organisational	Firms as social systems influenced by goals, routines, organisational structures, etc.	Company strategy or focus, lack of funds, lack of management systems, etc.
Behavioural	Individuals' values and attitudes within companies	Lack of attention, lack of perceived control, lack of information, risk averse nature of existing market actors, etc.
Technological	Availability or lack of knowledge, technical artifacts or knowhow.	Lack of equipment or other tools, undeveloped technology from the market, cost of technology, unable to support technology, etc.

These categories could be examined in view of the internal-external scale. Institutional barriers, like regulations and investment-conditions, and market barriers, like cost of labor and supplier leverage are barriers that, broadly speaking, companies or individuals have limited direct impact. In other words, these categories swing more towards the external level of the scale. Furthermore, organizational barriers, such as liquidity situation and organization strategy, as well as behavioural barriers, such as attitude, degree of information and risk tolerance are both more internal categories. There is, however, a connection to external barriers, which the willingness and capability of both companies and individuals to address external barriers, such as structural financial policies and framework, demonstrates. Lastly, technological barriers are characterized by both internal and external barriers; on one side technologies can arise internally inside organizations, but on the other side there exist government-backed R&D programs that also contribute to this technological innovation.

A significant stance to remember is that the categorizations of the barriers, such as the AMEC and BioIS and the Diaz Lopez et al categorizations, derive from the viewpoint of organizations. There is a comprehensive societal-level perspective, which isn't necessarily accounted for in the categorizations. Amongst other, they explore the motive behind CE and what challenges it is intended to approach on a broader level. For instance, the tightening of environmental pollution and making sure that we as a global society have sufficient resources are responsibilities on a societal level. These are equally important as concerns on an individual-level or on an organizational-level.

Govindan and Hasaganic (2018) provide additional insight with their clustered classification of drivers and barriers. For simplicity, they are split into two: a summary of clusters of drivers, which is shown in Table 2, and a summary of barriers to CE, that is illustrated in table 2. We will draw attention to the second table depicting the barriers. We consider two main takeaways. Firstly, considering we are discussing CE in view of an economic behavioural setting, we find it interesting that split incentives are mentioned as one of the barriers, yet again emphasizing that economic behaviour needs to be examined. The authors point out the complexity when several actors are dependent on each other to reach a common goal, which is increased CE activity in this instance. We are considering two actors and only two viable options: a CE related activity and an activity not related to CE. If one of the actors is not directly economically incentivized (i.e., risk of losing money if executing CE activity), and at the same time is responsible for a particular resource-efficient decision or CE related investment, there is a probability that the alternative activity is picked in favour of the CE activity. Govindan and Hasaganic's table exemplifies: "Examples include landlords not having the incentive to provide energy-efficient properties in cases where tenants pay the energy bills; or manufacturers not having the incentive to design products amenable to recycling or remanufacturing, because they are not exposed to the costs of waste disposal." It complements some of the previous literature, highlighting inter-personal incentivizing. Secondly, the authors provide some secondary barriers related to the practical transition to CE; the potential for "losers" as a result of the CE and the "rebound effect". The first effect refers to the fact that (potential) economic rewards are not evenly spread amongst actors. Certain countries, sectors and regions that are highly dependent upon elicit industries could turn out to be "losers" because they would need to pay a higher price due to their dependence on extractive industries. This creates an incentive for these sectors and the inhabitants of these regions and countries to not go through with a transition to CE. The second effect is deemed as the rebound effect, which refers to the fact that the transition to CE is a net-zero-game or even a negative-game: if CE measures result in savings in costs and direct materials, it is possible that the extra money and resources could be spent by actors on other resource- or energy-intensive products.

Korhonen, Honkasalo & Seppälä (2013) also acknowledge that there are several limitations to their view of the CE concept. There are several key questions still left unanswered. To complicate even further, CE systems are complex because they consist of social-ecological elements and operate in the crosshairs between humans and the environments surrounding us.

Thus, the authors have captured what they think are the main six challenges for the CE concept and its implementation. These supplements the theory surrounding potential barriers for CE brought by Ekins et al. They touch on concrete focal points, whereas Ekins et al discussed the barriers in a more general manner.

2.3 Research questions

After delving into the theoretical frameworks, and doing some research on the topics at hand, we have carefully tried to formulate some research questions, in order to generate a viable and holistic view on the thesis structure. These research questions are set to firstly make an introduction of today's situation, before trying to capture nuances attached to external and internal incentive factors, and the weighting of these, before we try to give some summary points on what could incentivize companies to behave sustainably. The questions should be seen in relation to each other, and not in isolation. We have developed a model of the research questions at the end of this section.

2.3.1 The building- and construction industry's stance concerning sustainability

The building industry in Norway is a large source for much of the country´s waste generation (Byggemiljø, 2019; Deloitte, 2020). This is something both the industry and the Norwegian government are aware of and taking actions against. One example of such an initiative is the National strategy for a green, circular economy, put forward by the Norwegian government in 2021. This report covers the circular economy through sustainable production and production design, sustainable consumption, circular circuits and circular value creation in different industries (Regjeringen, 2019). Another important initiative is the "Knowledge base for a national strategy for circular economy" report issued to Deloitte by the Norwegian Ministry of Climate and the Environment. In this report Deloitte finds the building industry to be an industry with a huge potential due to its massive material use and huge waste generation (Deloitte, 2020). Deloitte's report identifies several indicators for increased circularity, in particular better land usage, better maintenance and increased use of circular material. As a part of a structural shift towards solutions, this report highlights the need for awareness for businesses in the adjacent industry in relation to sustainability measures. Conclusively, the perception of the industry actors themselves are of utmost importance and a suitable place to

derive from, like Ahn et al (2013) showcase in a similar study about perception on green building sustainability in the American construction industry.

It could seem like the industry as a whole is aware of the sustainable and environmental issues which emerge from its current practices, and initiatives such as "Fra avfall til ressurs (from waste to resources)" by the Norwegian government shows initiatives in solving some of these issues. Though the governmental position seems clear, a big part of the responsibility lies with the businesses to take action to enable more sustainable and circular changes in the industry. Thus, it could be valuable to establish some fastening points with respect to awareness in general, which attitudes are applicable and the connecting degree of emphasis and the interlink between these inherent attitudes and eventual concrete measures from the business' point of view. For instance, a study by Merriman et al (2015) have researched the roles of incentives for employees in a sustainability context, and Adetunji et al (2003) try to gauge business' response to sustainability issues raised, underpinning the interrelatedness and a potential need to research this even further.

There are numerous international scientific examples where this is done, like the ones in South Korea, Cambodia, USA, Canada and Australia (Whang et al, 2015; Durdyev et al 2018; Chan et al, 2017), to mention some. To the authors' knowledge, there is limited mapping of the stance on sustainable and circular solutions on behalf of the actors in the industry in a Norwegian context. Hence, a study like this could complement this international research. In order to better understand fundamental stances and attitudes on this subject, we would like to raise the first research question:

RQ1: What stance do the business/industry have concerning sustainability/CE?

2.3.2 External incentive schemes

The thesis introduces some applicable incentive schemes in relation to the industry and breaks them up into externally infused and internally infused incentive schemes, which is a common way in research on these topics, exemplified by amongst others Olubunmi et al (2016) and Gurzawska et al (2017). To further contextualize and to make necessary rural measures concerning the succeeding research questions, we make distinctions between barriers and drivers of these incentive schemes, supported by studies made by Akadiri (2015) and Ahn et al (2013). An important general observation that arises when considering barriers and drivers

for sustainability and CE efforts for businesses, is that they often operate in a holistic context, rather than in isolation to each other. Barriers and drivers to CE also frequently work in combinations with one another, which is one of the main topics brought up by Durdyev et al (2018). Although there are several examples that bring up how external and internal incentives schemes affect businesses in the building- and construction industry, we deem it necessary to bridge the gap between general attitudes, relevant incentive schemes and how these could function in practice and gain a general understanding on how they function interconnectedly. Thus, we find it interesting to research this topic further.

To start off we recite some of the most prominent and influential stakeholders. First and foremost, regulators (i.e. supervisory organizations ("arbeidstilsynet", "statens forurensingstilsyn"), directorates (i.e. "direktoratet for byggkvalitet", "direktorat for brann- og eksplosjonsvern"), ministries (i.e "finansdepartementet", "nærings- og fiskeridepartementet", "klima- og miljødepartementet") and government agencies (i.e. "bygningsteknisk etat") are an inherent stakeholder to start with due to the fact that the industry in large is regulated; examples could be pricing signals, subsidy politics, tax policies, fiscal policy measures (i.e. documentation demands) and investment terms (Ekins et al, 2019; Deloitte, 2020; Circular Norway, 2020). All these regulations could well be factors that affect how businesses in the building industry are incentivized with regards to which degree they focus on sustainability/CE. Previous research on amongst others regulatory incentives on green building development (Qian et al, 2016), regulatory issues for investing in sustainability (Richardson, 2009) and inspecting regulatory incentive instruments for corporate sustainability (Möslein et al, 2017), are contributing to pave the way for further research on this topic.

Secondly, Ekins et al (2019) mention the influence of market factors in relation to business incentivizing. General market conditions (i.e., business cycles, macroeconomic conditions), relative cost of labour and commodity prices (i.e., cost of materials and energy) could attest as examples in this matter. Furthermore, Ekins et al actualize how business incentives could be impacted by other stakeholders like suppliers, customers and financial institutions/creditors, through their condensed frameworks of barriers and drivers. Another example of scientific research that touches upon aspects in this manner, is the one from Tong et al (2018), which argues that businesses could for instance be behaviourally affected by suppliers in terms of supply chain dynamics and the balance of power in the supply chain.

Customer demand and customer feedback and access to capital from creditors could also function as incentive schemes to incentivize businesses in their behaviour towards sustainability/CE in their operations (Ekins et al, 2019; Deloitte, 2020).

The intention of this section is not to make an exhaustive list of external factors that affect how businesses are incentivized with regards to the degree of focus on sustainability/CE, as this is by no means an exhaustive list, but to actualize the relationship between businesses and their surroundings. Because of this actualization we would like to seek more information on and raise the following research question:

> *RQ2: How do external factors affect how businesses are incentivized in the building industry, with regards to degree of focus on sustainability/CE?*

2.3.3 Internal incentive schemes

It is important to understand why businesses make the choices they make internally in a sustainability context. Apart from governmental direction and directives, becoming more sustainable is in principle a choice companies could make and choose to focus on. Several internal incentive schemes could help explain a movement towards sustainability, such as operational costs, business reputation, profitability and maintenance of strategic relationships (Presley et al, 2010). Furthermore, Durdyev et al (2018) call attention to incentive structures like the ones of innovation in projects, knowledge management and general commercial viability. As for reducing business costs, McKinsey conducted a survey in 2011, looking at business sustainability (McKinsey, 2011). They found that 33 % of businesses were improving operational efficiency and cut costs by integrating sustainable practices, which resulted in a 19 % increase from the previous year. These cost reductions, reduced energy use and waste directly improved returns on capital. Becoming more sustainable could also provide competitive advantages and ultimately increase the bottom line. A study conducted by the non-profit CDP found that corporations that are actively managing and planning for climate change gained an 18 % higher return on investment (ROI) compared to companies that didn´t. Similar thoughts are shared by researchers from Harvard business review, stating that: “We´ve been studying the sustainability initiatives of 30 large corporations for some time. Our research shows that sustainability is the mother lode of organizational and technological innovations that yield both bottom-line and top-line returns” (Nidumolu, 2009). These examples and their

implications could help explain some causal effects when researching internal business behaviour, like the study of Chan et al (2017) does. This could potentially strengthen the overall impression of the linkage between the thesis' parts.

One could also view this in another interesting perspective by contextualizing that an overall understanding of the "internal stakeholders" is befitting. For instance, Gan et al (2015) introduce the owner's perspective with respect to sustainable construction, but one could also consider the frame of minds of respective work groups on an individual level (e.g., associates, middle-management, top management) or in an organizational level (e.g., department-wise). In a more structural manner, Hallstedt et al (2010) contextualize how internal incentive schemes could affect and integrate internal incentive schemes, like product development, in a strategic decision approach, showcasing another layer of complexity in internal incentive schemes.

These incentive schemes illustrate a critical point, which have to do with the fact that they represent a key part of the total incentivizing context. Additionally, one could argue that internal incentive schemes are dependent upon externally infused incentive schemes, and if one analyzes the effects these have on each other, they could illustrate that they together could have some explanatory power. Although there are several studies and examples on the topic of internal incentive schemes in relation to sustainability, and why they choose to do so, there are not many studies contextualizing the viewpoints from a middle-management perspective. As well, we think that internal incentive schemes add a layer of complexity when partnered with external incentive schemes - viewing a bigger picture. Thus, we raise the fourth research question:

> *RQ3: How do internal factors affect how businesses are incentivized in the building industry, with regards to degree of focus on sustainability/CE?*

2.3.4 Weighting of the external and internal incentives on sustainability

To effectively assess factors that affect businesses when it comes to incentivizing with regards to the degree of focus on sustainability/CE, we would also need to research the degree of emphasis each factor has for the businesses. In other words, the relative importance of each factor. In such an assessment we consider the fact that the businesses value different incentive factors on a scale, rather than as a dichotomy in the lines of "this factor have an effect on how

the business is incentivized" versus "this factor does not have an effect on how the business is incentivized". This is important due to the fact that if businesses view different incentive factors as "more critical" or "less critical", one could assume that actual behaviour will tend to follow the subsequent pattern. Research provided by Durdyev et al (2018), Berawi et al (2020) and Akadiri (2015) highlight that this research topic is highly relevant. Presley et al (2010) emphasize for instance how incentive schemes could be measured and weighed in terms of creating and applying benchmarks to a sustainable construction industry.

In the context of organizational economic behaviour, there are traditionally several schools of thought, further highlighting the need to make these distinctions. On one hand, traditional economic behavioural theory, with Milton Friedman (2007) as one of the spokespersons, argue that: "[...] there is one and only one social responsibility of business—to use its resources and engage in activities designed to increase its profits so long as it stays within the rules of the game, which is to say, engages in open and free competition without deception or fraud". Friedman's logic emphasizes thus the business' considerations for profitability; companies that trace profits ultimately lead to social utility maximization. We consider it as an interesting task to see if such a hypothesis applies according to the respondents. On the other hand, there is an increasing number of studies trying to quantify the effects other aspects not traditionally considered of economic interest, such as cultural aspects like heritage value (Whang et al, 2015), social aspects like the degree of well-being (Presley et al, 2010), or moral considerations (e.g. considerations for forthcoming generations, CSR-considerations). By highlighting the width and complexity of external and internal incentive factors, we actualize the notion that businesses and their behaviour and consequent activities are skewed towards the "things that really matters". In this lies an assumption that, in fact, there is a connection between what businesses say they focus on and how they actually behave.

Following the two former research questions, which touch upon internal and external motivational factors and incentives that businesses address, we seek to elaborate on which of these motivational factors or incentives is deemed as more or less important. We emphasize that we do not seek to provide a fully holistic and exhaustive list of all possible incentive schemes, external or internal, but rather make suitable categorizations to gain a general understanding of the issues at hand. Other considerations like the degree of complexity of the research questions asked to respondents are also taken into account. In other words, we would like to gain a view of how the businesses weigh the incentives, to gain an understanding of if

certain motivational factors are weighed differently. Thus, we have formulated the following research question:

> *RQ4: Which incentives weigh more heavily in the consideration of the degree of efforts towards sustainability/CE?*

2.3.5 How to effectively incentivize businesses to become more sustainable

Taken from the literature review, studies on the topic of incentives found that intrinsic motivation can be reduced significantly by the introduction of monetary rewards, such as in Gneezy´s "when and why incentives (don´t) work to modify behaviour (Gneezy, 2011). On the other hand, monetary rewards are proven to have an effect on behaviour (Gibbons, 1998). By understanding the underlying incentives in corporate decision making towards sustainability and circular models, one can easier choose incentives that will work to modify behaviour. These are two lines of thought, traditionally viewed as an incentive scheme belonging to the economic theory, that conceptually could help with conceiving how businesses act as far as sustainability goes. By identifying what incentivizes sustainable business models, how businesses weigh the incentives one could more accurately make an informed assumption of how to effectively incentivize businesses to become more sustainable/more circular.

Existing research, like the ones of Spence et al (1995) and Gan et al (2015), tries to pinpoint concrete means to develop sustainability in the construction industry both in the role of businesses and regulators, and make some concluding remarks and recommendations to their studies. Reports from consultancy agencies, like the one from Deloitte (2020), and from NGOs, like Grønn byggallianse (Norwegian Green building council) (2021) do also stipulate recommendations, underpinning practical relevance from actors working in the interface between businesses and their surroundings. It could therefore constitute a suitable foundation for our thesis as well, because it cares for a more conclusive wrap-up. Thus, it will adopt the format given from the aforementioned studies, by discussing what recommendations could be applicable in the view of the results of the previous research questions. Identifying what motivation and incentives lies behind the decision making within each business and discussing potential recommendations is paramount in order to implement strategic measures towards sustainability. We believe that by answering the previous research questions one can ultimately find an effective answer to the fifth and last research question:

RQ5: How to effectively incentivize companies to become more sustainable/more circular?

2.3.6 Model of research questions

By asking and answering the research questions in this order, we've created a model in which we believe will help identify the motives of why corporations choose to become more sustainable and how to further incentivize this behaviour effectively. Conceptually, this derives from the relationship between the different topics of existing research.

Firstly, we would like to identify what general stance and perception employees in the construction industry (i.e., middle management) has concerning sustainability and the circular economy (RQ1), and complement research done by amongst others Mozes et al (2011), Spence (1973) and Turban et al (1997). Existing research highlight the connection between three topics: incentive structures (i.e., what incentivizes employees to behave the way they do with respect to sustainability), actual employee behaviour and sustainability itself (Huber et al, 2015). With the first research question we can capture some of the most pressing employee attitudes with respect to the relationship between general business and industry attitudes and actual behaviour with respect to sustainability. We believe it to be crucial to recognize how businesses and employees think about the subject. Amongst others practical and economic feasibility, drivers and barriers are some prominent topics that could serve as room for further discussion and points that could be subject to evaluation (Du Plessis, 2007; Shi et al, 2013, Bon et al, 2000). Even more, the model depicts a reciprocal relationship between employee attitudes and the surrounding incentive structures, illustrated by external and internal incentives structures, as actualized in recent studies by amongst others Durdyev et al (2018) and Hughes et al (2019). Thus, the model is trying to illustrate that employee attitudes are subdued to the external and internal incentive structure and vice versa, which is important because it illustrates one of the main points in the model, namely the interconnection between them.

Secondly, we would like to identify how external factors affect how businesses are incentivized in the construction industry with regards to degree of focus on sustainability/CE (RQ2), and complement existing research on the topic by, amongst others Olubunmi et al (2016), Durdyev et al (2018) and Hughes et al (2019). By actualizing the relationship between

the business and their surroundings, e.g., its suppliers, financial institutions, market factors, competitors and regulators, one can view the impact of how changing surroundings have an impact on decision-making within the business, conceptualizing the theoretical connection between employee behaviour and external incentive structures. These links could also serve as a base for evaluation when one in a later stage are trying to quantify the explanatory power between these links. For example, if one assumes that regulatory legislation affects negatively in terms of sustainable practice in businesses, this model could portray the relationship between the incentive structure (RQ2) (i.e., the regulatory legislation) and the business' behaviour (RQ5).

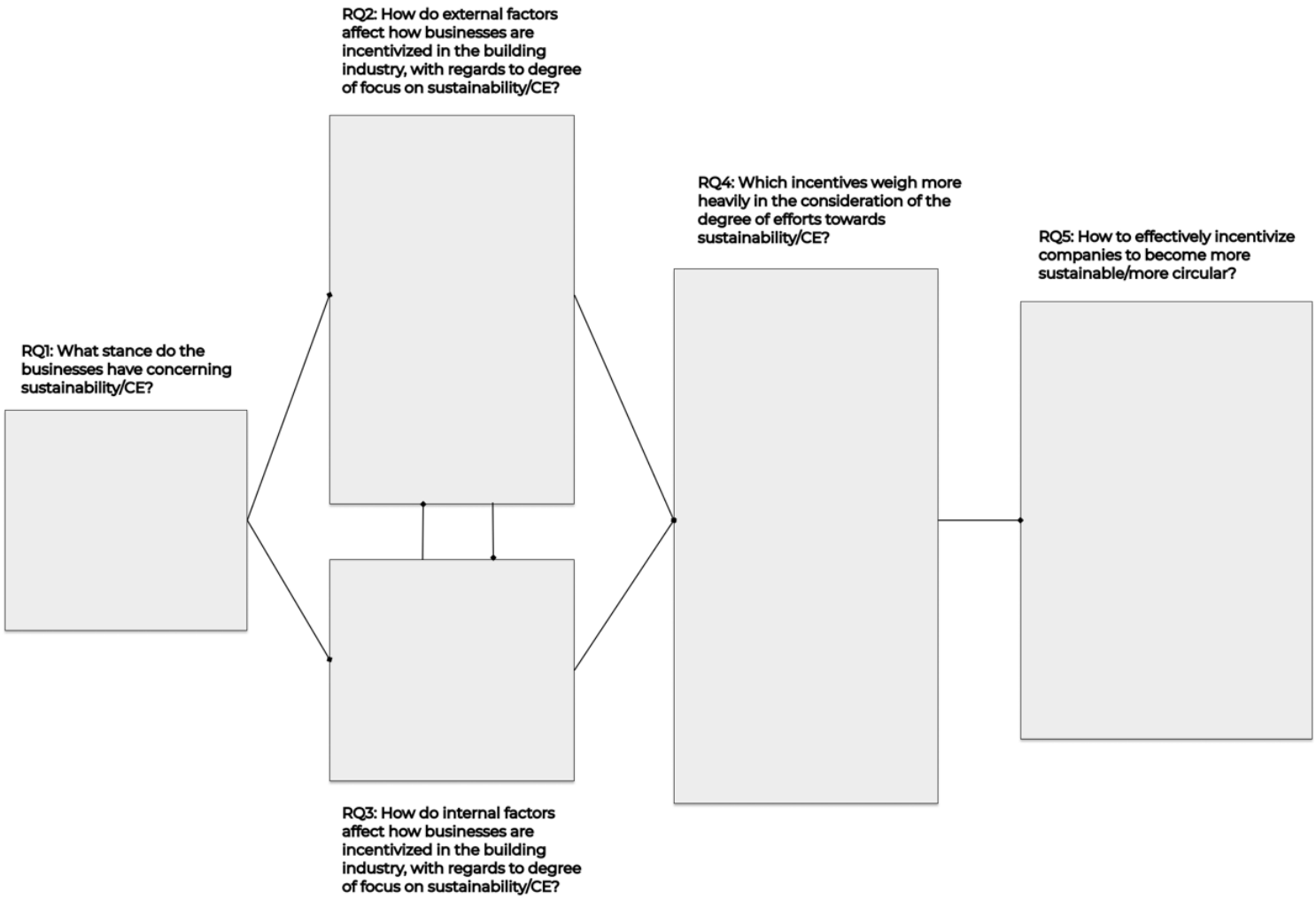
Furthermore, we believe that both businesses' perception of sustainability/CE and external incentive structures affect and incentivize business' internally towards sustainability and circular solutions (RQ3), and complement existing research, done by amongst others Hallstedt et al (2010) and Presley et al (2010). Thus, by identifying and answering RQ1 and RQ2, we believe one could get a more correct answer to RQ3 concerning internal incentive structures. The same for RQ2 applies for RQ3; employee and business perception affect the internal incentive structures, reciprocally. Although the model depicts a static approach, these relationships are more dynamic by nature. Even more, the connection between RQ2 and RQ3 is essential; while business/employee perception affects external and internal incentive structures respectively, the model also depicts a relationship between the external and internal incentive structures. For example, alignment of incentives between suppliers and clients could affect how business internally treat their client purchasing power for sustainable practices.

By thoroughly identifying what motives and incentivize businesses, it is also important to understand which incentives weigh more heavily and which weigh less heavily in consideration of the degree of efforts towards sustainability/CE (RQ4) and thus complement existing research by amongst others Augenbroe et al (1998), AlSanad (2015), Akadiri (2015) Berawi et al (2020) and Durdyev et al (2018). By doing this, one would get a better understanding of how different incentives would affect behaviour, and more importantly, illustrate a fundamental prerequisite for the model, namely that incentives carry different weight in relation to each other; the effectiveness of the incentive structures are inherently different (Huber et al, 2015). For instance, if businesses view public image as less important than profitability, heavy incentivizing regarding reputation could turn out to be less effective. This could further carry repercussions for the relationship between RQ4 and RQ5. Concisely,

if one is supposed to effectively incentivize businesses, there is no point in take action to empower the *weak* incentives. This highlight another systematic constructive of the model; that there are positive and negative incentive structures, that points to a distinction between *carrots*-incentives and *sticks*-incentives (Hilbe et al, 2010). Although the thesis does not cover this extensively, the model could benefit the system thinking approach to sustainable construction by emphasizing the point of RQ4 and the weighting of incentives. By identifying what incentivizes businesses and how these incentives are weighed, the model would find a suitable answer to how to effectively incentivize companies to become more sustainable/more circular (RQ5), and complement existing research done by amongst others Spence et al (1995), Gan et al (2015) and Du Plessis (2007). Lastly, a model like this could be used as a tool to assess existing hypotheses, like the study of Huber et al (2015).

Following the model, one carefully considers all the factors that come into play when it comes to incentives towards sustainability/CE, and step-by-step identifying incentives, how they are weighed and best what incentives are most efficient to introduce in order to modify behaviour towards a more sustainable and circular business model.

***Figure 3**: Thesis model depicting the relationship between the research questions*



3. Methodology

The purpose of this chapter is to clarify the methodological approach in the thesis. Initially, relevant theory and concepts with the method will be presented. Then a decision is made on the relevant thesis' choice of method, and we explain why a qualitative research design is appropriate for the thesis, and why a grounded theory study has been chosen to shed light on the topic in question. Further on, we will elaborate on the research design, data sampling- and collection, analytical methods, and what consequences these have for the study. The chosen method will be gradually evaluated for strengths and weaknesses, in order to assess the thesis' degree of reliability and validity. The purpose of the study is to investigate the motivational factors that underlie behavior and concrete acts in relation to businesses in the building- and construction industry, and how one could incentivize businesses to increase efforts in this particular area of business. Furthermore, we want to identify some factors to make it easier to comprehend how these businesses actually are incentivized and make an appropriate framework for future studies.

3.1 Research design

In research we divide between qualitative and quantitative methodology. Qualitative method is characterized by the fact that it emphasizes analysis and understanding of connections in individuals or individual cases. The method is less structured, and aims to gain deeper insight into, among other things, motivation and attitudes that can explain the phenomena being studied (Saunders et al, 2009). The method is therefore well suited when faced with a descriptive or exploratory design, which is the case for this study. While quantitative methods, on the other hand, are characterized by a large number being examined, where the purpose is to test a hypothesis that has been made in advance (Saunders et al, 2009). Here, it is tested whether reality agrees with the hypothesis and assumptions one has in advance, normally found through a qualitative study, using statistics. This method is used to find out whether the phenomenon is quantifiable in a larger group, i.e., whether a phenomenon that has been observed in one or a few samples can be observed in a larger population. The method is well suited when faced with a causal or descriptive research design. The thesis has an exploratory dimension to it, trying to identify nuances in attitude, rather than necessarily capture generalizable and statistically significant conclusions. Due to these properties, we find it suitable to pursue a qualitative research design, following a grounded theory strategy.

3.1.1 Grounded theory

Arguably, regardless of research design, one of the main turnouts for qualitative research is creating theories. Occasionally, the objective is to fundamentally develop an inherently new theory, while at other times the objective is to extend or broaden an existing theory (Eisenhardt et al., 2017). It is specifically useful when encountering "how" questions, notwithstanding if the question is normative or descriptive, nor if the process is focused on similarity or is variance based. The already formulated research questions hold to a certain degree a lot of descriptive treats, and thus the determination of research design needs to account for this. Therefore, we find grounded theory building suitable for this thesis. Amongst several others, Glaser et al (1967) and Walsh et al., 2015, states that grounded theory building is much like a "big tent" - depicting an image where grounded theory building is like building a theory from data. In a grounded theory strategy, data collection and theorization start with it being developed from data created by a series of observations, but will heavily rely on interviews due to its practicality. The data results in the creation of predictions which are then tested in observations that either confirm, or otherwise, the predictions. Although this seems inevitable, regardless of research design, this is an interesting focal point. This involves collecting data, breaking it up into what Gioia et al (2016) calls: "[...] first-order and second-order themes" and what Eisenhardt et al (2016) calls "[...] "measures" and "constructs". This has to do with the way data is gathered and structured. After you get to know the data, you are supposed to come to know the data and construct "codes" as you go through the data, to categorize certain aspects discussed in the text. Such codes are a specific "single idea associated with a segment of data and consist of pithy labels identifying what is of interest in the data" (Braun & Clarke, 2012). As practical examples in this thesis we have categorized some fundamental themes such as "external incentive structures" and "internal incentive structures" - which operate as basic labels that start breaking down the data, and as a means for departure in order to abstract the study further.

When we became satisfied with this step, the next step was to start developing "themes". Braun & Clarke (2012) characterize themes as "an idea or concept that captures and summarizes the core point of a coherent and meaningful pattern in the data" and "a common, recurring pattern across a dataset, clustered around a central organizing concept". In general, there are fewer themes, and in addition, they are distinguished in a more conceptual manner - that is, rather broad. This is also the case for our thesis. In principle, the themes are supposed to be close to

answering the mentioned research questions. For example, “profitability is the most important motivational factor for businesses” or “businesses weigh external and internal incentives differently”. Braun & Clarke describe themes as traditionally a short self-explanatory sentence, where codes are usually one word or term labels. First off, we ran an iteration by conceptualizing these themes, and attempted to verify if they were usable by cross-checking each interview to see if they recurred and seemed reasonable. We then ran several iterations until fully satisfied. Grounded theory is produced by displaying the dynamic relationships among the derived concepts. Done correctly, the conveying from data structure to grounded theory illustrates a good example of data-to-theory connections, a focal point for reviewers of research papers, which makes the grounded theory approach suitable for this kind of study.

Grounded theory originally stems from research made by Glaser and Strauss (1967) and is frequently considered an ideal example of an inductive approach to the research design, but such a conclusion is oversimplified. Conversely, it is more suitable to think of it as theory building combining an inductive and a deductive approach. Collis & Hussey (2013) further makes a note of the same point, and they emphasize the continual reference to the data. Applying a grounded theory strategy is, among other, according to Goulding (2002) notably useful for research to predict and interpret behavior, which is at the forefront of our research, combining incentive and motivational aspects, to try to give some explanatory power to why they behave the way they do with respect to sustainability. In this thesis grounded theory strategy can be utilized to explore a wide range of organizational aspects with respect to incentivizing and organizational behavior from a middle-management point of view.

3.1.2 Sampling

In a general sense, the exact number of participants needed for a study like ours is dependent upon several key aspects, like the scope of the study, the nature of the topic, the quality of the data (Morse, 2010) and time constraints. The scope of the study is rather broad, consisting of both the building- and construction industry and themes surrounding incentives with respect to sustainability in businesses. The nature of the topic could also be broad, as it consists of organizational behavior mechanisms. The higher number of respondents usually causes a higher degree of quality in the data, as it can capture more nuances in the data. All this calls for a “high number of respondents”. Common grounded theory studies often consist of sample sizes varying from 10 to 60 participants (Saunders et al., 2007). Time constraints are a participating factor in keeping the number of respondents at the low end of the scale. As a

general rule, one should continue to add participants until the sample reaches "theoretical saturation". This is deemed to be reached when the full extent of the theoretical framework is represented in the data; that is, most or all of the mentioned themes and concepts. We have chosen to conduct 10 interviews to comply with this, as we think we have reached a satisfactory level of nuances in the research, where the intuition is to instigate the complexity of different dimensions of the social processes that the researcher wants to examine. This point is strengthened by the fact that the professional backgrounds of the respondents are diverse covering most parts of the value chain in the construction industry: from subcontractors, component manufacturers and engineers, to architects, technical directors and entrepreneurs.

Generally, we reached out to medium sized and large companies due to logistical considerations, as we believed that these companies would have a middle-management structure that made it easier to conduct interviews. We constructed an idea of a trade-off, where "regular employees" could have limited knowledge of company strategy and the practical implications of sustainability, but are more available for interviews, while top management have more knowledge of strategy, but are less available for interviews. Middle management was thus deemed as a decent compromise. In addition, these companies have, to a greater extent, resources to handle their own staff with a mission to work with sustainability, and some even have their own sections and departments dedicated to the relevant topics. Since the public sector operates quite differently than the private sector with less of a focus on profit and the bottom line, which can be important motivations in sustainable decision making, we have exclusively sampled respondents from the private sector. This causes implications for the study's reliability and validity, in which we will discuss later in section xx. In sum, we believe that the sampling strategy is satisfactory in terms of the characterization of grounded theory data sampling.

The sampling strategy was strongly attached to knowledge of the topic of sustainability, as well as practicality considerations. We reached out to the foremost actors in the building- and construction industry in Norway. We have summarized an overview of the respondents in the following table.

Figure 4: *Illustration of sample respondents and adjacent businesses*

	Job title	Gender	Seniority
1.	Sales manager concrete products	Male	30 years
2.	Civil engineer/ consultant water and sewage department	Male	22 years
3.	Department manager for antiquarian advisory and cultural heritage	Female	17 years
4.	Regional manager for southern and western Norway	Male	23 years
5.	Head of enviroment and sustainability in building department	Female	5 years
6.	Team leader energy department	Female	8 years
7.	Manager external environment	Female	7 years
8.	Project- and market manager for environmental department	Female	11 years
9.	Division director for technical solutions	Female	6 years
10.	Department manager for architect department	Female	27 years

	Line of business	Size of business
1.	Concrete and concrete product producer	Medium-sized
2.	Consulting engineering, planning and architecture	Large
3.	Consulting engineering services	Large
4.	Supplier of load-bearing constructs	Medium-sized
5.	Entrepreneurial business within building and construction	Large
6.	Entrepreneurial business within building and construction	Large
7.	Entrepreneurial business within building and construction	Large
8.	Consulting engineering techniques, environment and social economy	Large
9.	Consulting engineering services and environment*	Large

*Note that respondent number 9 and 10 are from the same business

3.1.3 Data collection

In a grounded theory strategy, data collection can consist of a mixture of qualitative approaches, such as observations, interviews or differing literary reviews, but often practicalities call for collecting data through conducting interviews (Starks & Trinidad, 2007). Even though observations often add a richness to the data in the form of "real" data, body language and so on, the impracticalities such as setting it up and the potential for intrusiveness and logistics, outweighed the positive counts. We also considered and weighed how much value is added by conducting observational studies versus just conducting and structuring interviews. Conversely, our research relied on interviewing as the primary data collection strategy, with a semi-structured interview format. This consisted of predetermined questions on topics with direct links to our set research questions.

A semi-structured interview format functioned to ensure focal points were covered in all interviews, and that the interviews were relatively uniform in the way they were carried out.

A semi-structured interview is open in its approach, allowing new ideas and aspects to be discussed during the interview, depending on what the participant and the researcher talk through (Saunders et al., 2009). Certain topics and themes are covered through an interview guide. The list of prepared questions was deemed relevant for each interview, given the context of the interview (i.e., position of respondent, organizational context in relation to the topics etc.). There were additional questions that were brought up during each individual interview that tried to cover accessory subtopics. Our sample of interview objects differ in many ways (i.e., size, business model, degree of sustainability emphasis), raising expectations of response and views differ accordingly. To compensate for respondents' differences, we conducted each interview with follow-up questions and conversations directed at each respondent's answers, situations and views on sustainability and the circular economy. Given the nature of the data gathering (i.e., a conversation), we decided to record audio for each interview in order to be able to transcribe what was being said and capture relevant quotations. We did not include body language or other such "real" data during the interview in our data collection, as we thought our expertise in the area and the logistics in using this as primary data would offer little of weight to our research.

As a part of the interview, we also handed the respondents a short questionnaire, directly focusing on nuances of how external and internal factors affect motivation towards sustainable solutions within the business. This questionnaire is directly linked to our research questions, and its purpose is to identify how each respondent weighs these factors as more or less important in the consideration of degree of efforts towards sustainability. There are a lot of internal and external factors to consider in this regard (i.e., customers, suppliers, regulators, strategic considerations etc.), and we believed it to be easier to obtain more correct and thoughtful answers through a questionnaire rather than on the spot, where respondents would have to memorize all the internal and external factors, and most likely be under recency bias, where the previous discussed topics during the interview would immediately come to mind, overshadowing the others.

3.2 Data quality

Now, the question that is still unanswered: how are we able to determine the data quality and the measurement of potential data quality issues? There are several issues related to the use of

semi-structured interviews, both in terms of the study's reliability, its validity and generalisability of the study's findings.

3.2.1 Reliability

With respect to qualitative research, reliability involves whether other researchers would disclose similar information (Easterby-Smith et al. 2008; Silverman 2013). Even though the denomination of "reliability" has traditionally been used in quantitative research, it is most suitable also in qualitative research such as this. Intuitively, if we deem the idea of evaluating to verify and validate research, we need to consider its quality. Because quantitative and qualitative research have different purposes in their methodology, it makes less sense to introduce the concept of reliability in qualitative research (Stenbacka, 2001). In contrast, other researchers, like Patton (2002), argue that reliability (and validity) is totally necessary in qualitative research as well, in order to quality check the study. Reliability in qualitative research, put in other terms is described by: "How can an inquirer persuade his or her audiences that the research findings of an inquiry are worth paying attention to?" (Lincoln & Guba, 1985). It is thus the "trustworthiness" of the study that is to be evaluated.

3.2.1.1 How to measure reliability in the study

Although we have tried to cover that reliability and validity is broadly adopted in quantitative research, we will continue to discuss it in a qualitative context, such as our thesis, to grasp fundamental methodological aspects. Firstly, we will discuss reliability, then validity.

Just to reiterate: the concept of reliability should help us in our research by indicating how consistently our method is, especially in terms of measurement. If we were to apply the same method to the same sample under the same conditions, we should get the same results, and if not, this could indicate that the measurements may be unreliable. Generally, there are four types of reliability measures: test-retest, interrater, parallel forms and internal consistency. In the forthcoming section, we will discuss these. These types of reliability will lay the foundation for how we measure reliability. Tests like the four types of reliability are hard to execute in qualitative studies, as it is designed to fit quantitative-like research, with quantifiable measures such as correlation and variable ratings. Consequently, it is difficult for us to conduct a proper test of this reliability measure. The purpose of these measures is thus rather to create a framework for us to later problematize. Lastly, although we have a

questionnaire, this has limited statistical significance, so we have chosen to disregard this when assessing the methodological implications in this part of the thesis.

Test-retest reliability measures the consistency of results when you repeat the same test on the same sample at a different point in time, in cases when you expect the measurement to stay constant in the sample. There are numerous factors that could affect the results at various points in time: for instance, the respondents may have had separate frames of mind, or there could be other factors that influenced their capacity to answer precisely, such as time constraints or technical difficulties with the setup of the interview and wireless connection. Test-retest reliability is important because it could be applied to evaluate how completely a method can withstand the aforementioned factors over time. In practice, this means that a (relative) small deviation between the two sets of results, lead to a high test-retest reliability. Traditionally, to measure test-retest reliability, we evaluate the correlation between the sets of results. If we had sufficient data (i.e., a Likert-scale of RQs) we could for example have conducted a follow-up interview with the same respondent and have measured the correlation.

Interrater reliability concerns the degree of consensus between dissimilar researchers interpreting the same interview and is measured by allocating ratings to one or more variables. The reasoning for such a measure is to manage the subjectivity of us researchers, as we could perceive situations differently. To measure interrater reliability, we, as the researchers, could perform an individual analysis of the findings (for example, put the answer in a Likert scale that measures claim in relation to RQs, that goes from 1-7) from the interviews and compare this to each one. If the correlation is (relatively) high, we could argue that the study has high interrater reliability. If we were to do this, we should consider the criteria and its objectivity for the data collection, so each of us researchers would have had the same starting point for the analysis. If we use RQ2 as an example: How do external factors affect how businesses are incentivized in the building industry, with regards to degree of focus on sustainability/CE? Alternatively, we could make independent analyzes with a question along the lines of this one: “On a scale from 1-7, where 1 equal totally disagree, and 7 equals totally agree: customer demand is one of the most important drivers for sustainability in products/services”. If we would have had large deviations, this could indicate reliability strains, but it needs to be conducted on several questions and variables to have real effect.

Parallel form’s reliability is a means where the researchers compare different analyzes to each other. We could for instance create two different question sets, that we both use individually

in the interviews, and analyze questions and variables from both question sets. If the correlation between our analyzes are (relatively) high, this could indicate high parallel form's reliability. To exemplify, we could assess RQ3: What motivates/incentivizes businesses in the building industry to increase efforts towards sustainability/CE? In the interview, we could divide it into two question sets, where the following two questions could participate: "Which internal organizational incentives (such as profitability, attract talent, reputation etc.) are the most important in terms of focus on sustainability/CE?" and "Which internal moral incentives (such as CSR-considerations and concerns for future generations) are the most important in terms of focus on sustainability/CE?".

Internal consistency reliability is a means to evaluate the correlation between several objects in an analysis that is intended to measure the same object. There are two frequently used methods of measurement: the average inter-item correlation and the split-half reliability. Average inter-item correlation is assessed by evaluating the correlation between all possible pairs of questions and compute the average. While, if we were to use split-half reliability in our study, we could arbitrarily split a set of measures into several sets and compute the correlation between the two sets of responses. We exemplify with RQ4: Which incentives weigh more heavily, and which incentives weigh less heavily in the consideration of the degree of efforts towards sustainability/CE?". Let us consider four different measurements within internal incentivizing: profitability, organization culture, CSR-considerations and lessened scarcity of resources. These variables are assessed on a Likert-scale from 1-7, where the question is: "How much weight is given to the following internal incentives, where 1 is "very little" and 7 equals "very much". Consequently, we could divide the measurements arbitrarily into two question sets and compare.

3.2.2 Validity

To properly assess whether the findings of the research is valid (i.e., what they appear to be about) we need to evaluate its validity. Like the term "reliability", the concept of validity is broadly discussed - whether it is a useful connotation, or in fact not applicable in the context of qualitative research. Validity in qualitative research could not be described as a single, fixed or universal concept, but "rather a contingent construct inescapably grounded in the processes and intentions of particular research methodologies and projects" (Winter, 2000). Creswell & Miller (2000) have, for instance, proposed that the validity in a study is to a great extent influenced by the researcher's attitude towards validity and the following assumptions made

by him or her in their research methodology. If we take the example of rigor, as a redefining of the term "reliability" in qualitative research (which was introduced in the last chapter); Davies & Dodd (2002) further goes on to argue that rigor in qualitative research should differ from those in quantitative research because rigor in qualitative research is characterized by "[...] exploring subjectivity, reflexivity, and the social interaction of interviewing". Arguably, these are some of the foremost subjects of topic in terms of reliability in qualitative research.

The researchers consider discussion and measurement of reliability and validity to be of high interest in this study, despite a difference in opinion in the scientific fields. We find that the measuring of reliability and validity is of utmost importance, and we believe that if we are able to define criterions with respect to the study's reliability and validity and are able to discuss the implications of these measures on the study, that it is a necessary part included in the study. If done correctly, this could increase the chances of securing scientific quality in the study. Concerning the specific measures, we find it suitable to address these topics in terms of cognitive biases. There are numerous biases that are necessary to address. The implications of these biases will be discussed under section of methodological implications.

3.2.2.1 How to measure validity in the study

There are four types of validity that is to be reflected upon, in the context of measuring the validity of the study: construct validity, content validity, face validity and criterion validity (Sim, 1993).

Construct validity refers to if the study measures the concept it is supposed to measure. Constructs in this context relates mainly to broader concepts like sustainability and CE, as these are the topical main points throughout the thesis. Methodologically, given the fact that it is based on semi-structured interviews, it is somewhat difficult to assess the full extent of which implications this could have on the study's validity, but we could reflect on two specific data points: the interview guide and the questionnaire. One thing that points in the direction of proper construct validity for this thesis, is the naturality in the research questions, and the use of the interview guide. All of the respondents were aware of the contextual setting, given that they were invited as representatives for their respective businesses, to speak about sustainability and CE. They were also provided with the research questions at hand before the interview, so it is fair to say that this helped strengthen the construct validity. On the other hand, challenges posed to the exact questions given in each interview. The interview is illustrated in appendix A. To further achieve construct validity, we tried to ensure that we

made sound categorizations based on relevant existing knowledge, by first examining existing theoretical frameworks (for example from the line of study of incentive study, such as the one of Ekins et al (2019), and the one of Deloitte (2020)). Then we cross-checked which categorizations were able to "measure" to an extent through a simple interview with the respondents, and indeed if the respondents could have any relevant viewpoints in relation to these. For instance, we did choose to ignore the categorization of "technological incentives", because we did not think that it was easy enough to view structurally how technology and technological solutions could be incentives themselves. In hindsight, we probably could assess this once more, to see whether the categorization of "technological incentives" could be incorporated, to make the thesis more holistic. Although the categorizations made in relation to research question 2 and 3 were the ones of our own construct, and that was deemed well founded, we need to acknowledge that we do not know the full extent of the relationship between the different categorizations and if the respondents thought the division of incentive structures into "barriers" and "drivers" were suitable. Or indeed, if the interconnection between the categorizations and if the respondents thought the division of incentive structures into "barriers" and "drivers" were suitable.

Content validity assesses whether the study is representative of all aspects of the construct. This is of high relevance for this study, as one of the main delimitations we have made making this thesis, has to do with the fact that we do not provide an exhaustive list of incentives, but rather provide a list containing categorizations that make up the focus points. Accordingly, some aspects could be missing from the measurement of the incentives, and thus the validity could be somewhat threatened. On the other hand, by conducting the data collection from a semi structured interview, we enabled a situation where respondents could add information to the set focus points, by bringing up whatever they deemed most important of each categorization. By enabling respondents to bring up topics they deemed important, the interview would include the focus points in the initial categorization and potentially other important categories brought up during the interview by the respondents. The semi structured interview form of data collection would strengthen the content validity.

Face validity, much like content validity, looks at how suitable the content of the interview seems to be on the surface. It is a subjective measure, therefore considered a weak form of validity. It can, however, be useful in the early stages of developing a method. The purpose of the interview was to map and get an understanding of the research question of the thesis. We

deemed an interview as an effective way of approaching respondents and acquiring information regarding the research questions. We recognized that in our initial categorization within the research questions that we might miss some important factors that would have been left out of the thesis if we for instance only relied on a questionnaire as the only data collection. A semi structured interview would ensure that we went through the interview, covering the focal points in our categorization, while simultaneously enabling respondents to add information and important topics we might have left out during the categorization. By conducting the interview with the structure made with the research questions in mind, we considered the method to have high face validity.

The criterion validity considers whether a test can predict a certain outcome, or how well the test and its results approximate the results of other tests on the subject. The first problem of measuring the criterion validity in this thesis is the lack of similar studies on the construction industry. This lack of similar studies makes it difficult to compare the results found in this thesis with previous studies. Additionally, due to time constraint, this thesis could conduct an interview on ten different respondents. This is a rather small sample of actors in a relatively large industry. A small sample leaves room for varied results and certainly unrepresented opinions and viewpoints. A similar test (interview) with ten new and different respondents would be expected to yield some variation in answers given, and with a high probability of difference in opinions and experience. Since the respondents showed similar experience and shared opinions on many of the focus points, we believe strengthens the criterion validity of this thesis. On the other hand, the lack of previous research to compare with, and the small number of respondents in the data collection threatens the criterion validity in this thesis.

3.2.3 Generalisability

There is also likely to be an issue about the generalizability of the findings from qualitatively based interview studies, although the validity of such studies is not raised as an issue (Saunders et al. 2009). If we review the validity aspect first, this refers to the extent the respondent gets a hold of their respondents' understanding and experience, and to which degree they can gather a meaning that the respondent intended with their own language. We think that we can achieve a satisfactory level of validity when conducting semi-structured (qualitative) interviews by making and evaluating an interview guide, carefully clarifying the questions at hand for the respondents, probing the meaning of the responses and discussing them from a variety of angles. Yet, such studies do not provide us with statistical generalizations about an entire

population due to the fact that the sample is comparatively small and hence unrepresentative (Saunders et al. 2009). This is also often the case when using a grounded theory study strategy. For example, if we assume that there are around 260.000 employees (BNL, 2021) in the building- and construction industry, we are not able to make sound statistical conclusions based on interviews with 10 respondents. Additionally, just to emphasize the last point, the sampling strategy used does not necessarily lead to a satisfactory representative basis for statistical significance, due to gender issues (interviewed more females, even though there are far more males in the industry), geographical issues (sampled predominantly from larger cities like Bergen and Oslo, making companies in more rural municipalities underrepresented), company size (sampled predominantly from medium- and large sized companies, even though there are far more small sized companies). Although the point on generalizability could seem self-explanatory when presented with such examples, this is fundamental when interpreting the findings and the subsequent discussion from the study.

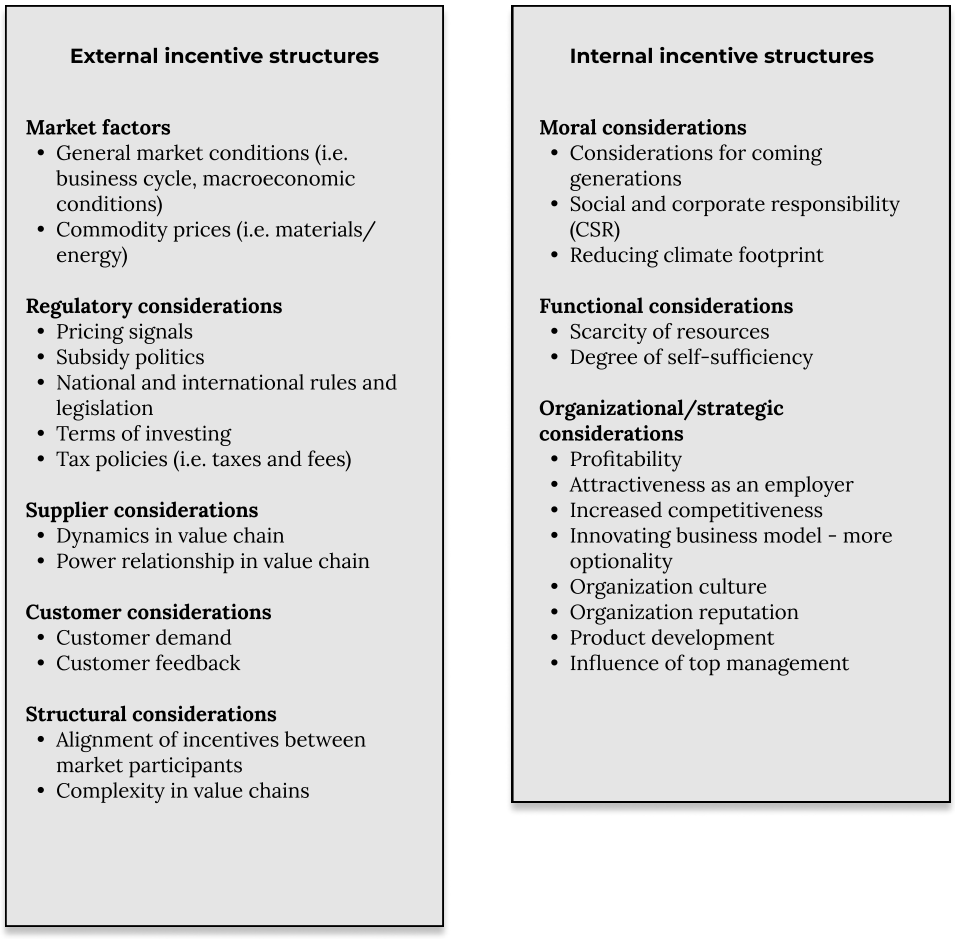
3.2.4 Analytical methods for results and discussion

In terms of analytical methodology, grounded theory relies heavily on three sets of processes: open coding, axial coding and selective coding (Wolfswinkel et al., 2013). The methodological process further on, that is largely used in the section about results and discussion, is based on these three processes. These processes are often not performed in a particular order but are rather used intertwined with each other at different stages of the research analysis. Open coding is in large part about capturing said "concepts" as mentioned in the sub-topic of research design, as well as articulating the concepts in a scientific fashion. In summary, open coding is thus to identify, label and/or build a set of concepts. These sets of "concepts" should ideally be mutually exclusive and well-defined, to make the analysis easier and more comprehensible for a potential reader. This will be discussed in the section containing methodological implications. The process of creating an interrelation between concepts and their sub-categories is called axial coding. A subsequent step was to integrate and refine the concepts that are identified, which was the process of selective coding. This step is much about theorizing the concepts in a manner that is appropriate for the research at hand. We have tried to verify that the concepts that are identified are useful for the research topic, through implementing it in the interview guide used in all the interviews.

In this thesis we recognized the need to make certain categorizations. In terms of particular research questions, we identified the need to make particular categorizations regarding

research question 2 and 3, following the external and internal incentive structures. We do not deem it appropriate to make categorizations surrounding general attitudes and stances. Because of this, we choose to disregard categorization for research question 1.

Figure 5: *Illustration of external and internal incentive schemes*



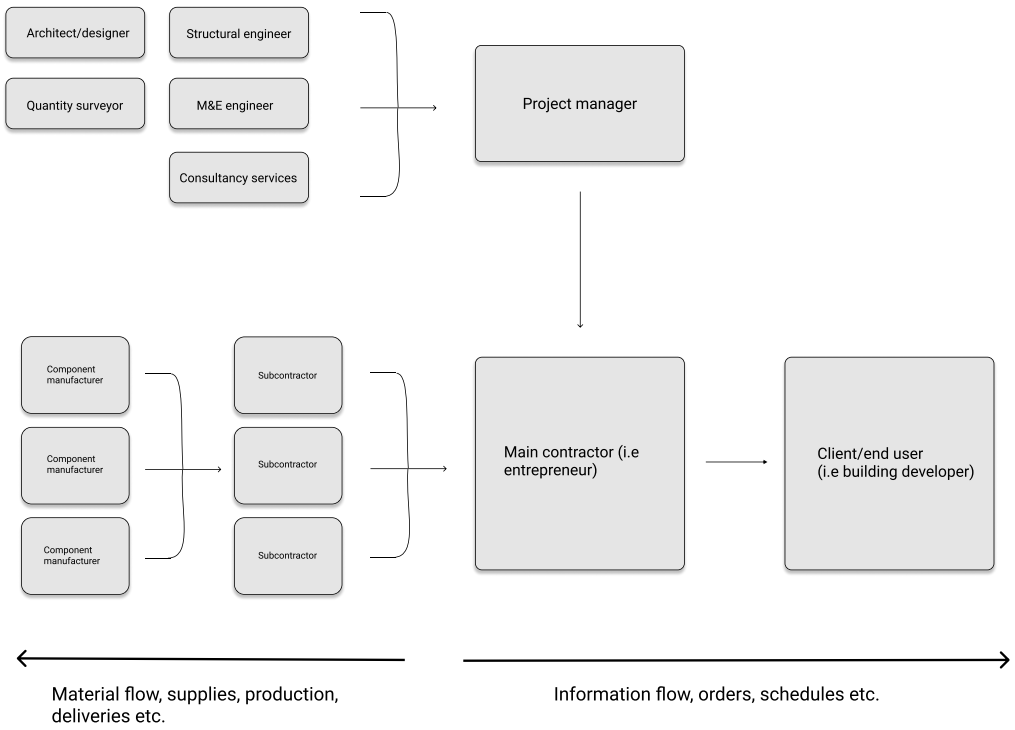
As previously stated, we are not looking to provide an exhaustive list, but rather present it as a means of structuring the thesis and provide a general list covering the main topics at hand. The categorizations will be sliced up into "barriers" and "drivers", to make it more comprehensible when interpreting the main findings. Also, in the forthcoming section about main findings, we have deliberately not followed the sequencing illustrated in the model, simply because all of the sub-categorizations are not mutually contradictory. For example, if we consider general market considerations in the external factors, these are in some ways incorporated in the other incentive points. In the same fashion, we have largely neglected functional considerations in internal factors since it was not really regarded by the respondents

at all throughout the interviews. We have nonetheless chosen to leave the entire model because it serves a good purpose, in our view, in illustrating the full extent of the thesis' contents.

3.3 Supply chain in the construction industry

To get a general understanding of the relationships between the market participants in the construction industry, and to be able to get a proper comprehension of the study findings and subsequent discussion, we will shortly introduce a simplified interpretation of the supply chain in the construction industry. It is illustrated in Figure 6. This figure does not account for the different project phases and further dynamics in these phases, but rather serves a purpose as to make a potential reader aware of how the connections work in a project. These phases and processes work intertwined, and they rarely follow a pure sequential manner like the model depicts.

Figure 6: *Illustration of the supply chain in the construction industry*



To start off with, usually there is a client (which we will refer to as a building developer) that makes an order of a building or construction. Oftentimes, there is a public client, in the likes of Statsbygg or municipalities, that are the owners and end users of the building or construct, but there are also private building developers. In this scenario, where Statsbygg is the client,

they will often hire a main contractor. This main contractor (we will refer to this as an entrepreneur) is responsible for the project overall, simply put, making general orders, making sure that the information flow is sufficient in the interactions between the actors and scheduling the project phases. They will oftentimes hire subcontractors, that is in charge of a respective area (i.e., concrete, steel, facade etc.), and in turn, will these subcontractors hire products or services from component manufacturers. The main contractor also often hires products or services from the likes of architects, quantity surveyors, engineers and consultancy agencies. These are not always mutually exclusive as some could consist of several service areas. For instance, although subcontractors often buy products from component manufacturers, sometimes they themselves do it in-house. This also applies to the main contractor. Sometimes, the main contractor has engineer services and/or architect and design services available in-house, or in fact be the end user itself, to mention a few examples.

4. Results

4.1 Main findings from data collection and analysis

The purpose of this chapter is to give the reader a clear overview of the data that constitute the basis for the discussion of our findings in chapter 5. As such, throughout this chapter, we will put emphasis on the most noteworthy findings, be it instances with great variation, similarities, or disparities. The aggregate findings from the interviews are presented in Appendix B. From the survey, we received ten responses from interviewed companies, whereof two of the responses came from the same company. The latter is not sufficient to infer any significant statistics and are therefore excluded from the thesis. The ten responses from interviewed companies corresponded to a large extent with our interpretation of the data from the interviews, and are synthesized in figure 4.

The following chapters are quite comprehensive. For the sake of clarity, we have included an illustration of the components that constitute the foundation of our thesis, and how they interrelate throughout the rest of the thesis (see Figure 8).

Chapter 4 presents the findings from the study conducted from our interviews and the questionnaire. From our initial correspondence we received 10 subjects willing to participate in the interview and questionnaire, which forms the data which this chapter will present. The chapter will present the findings of the interview and questionnaire directly related to the research questions, following the research question model. It is divided into xx parts. The first part contains findings related to research question 1, conceptualizing the business' general attitudes, knowledge, and competence on the subjects. The second and third part contains findings related to research question 2 and 3, that are external and internal incentive structures, respectively. As we think it is more structurally sound and natural to divide them into barriers and drivers, we will do this for these sections. The fourth part contains findings related to research question 4, attempting to weigh the incentive structures. Research question 5, concerning effective incentivizing tools for businesses, will be regarded in the "discussion" section.

4.1.1 Stances and attitudes in the industry (RQ 1)

To evaluate how the different factors, affect actors in the industry to work towards sustainability and a more circular economy, it would be helpful to map what stances the different companies have towards sustainability as a concept. By initially getting an understanding of how sustainability is approached and viewed one could subsequently look more specifically into how internal and external factors have shaped companies' view on the importance of sustainability. This section is directly related to research question 1.

4.1.1.1 Sustainability as a concept has increasingly become a priority, although to varying degree, for all businesses, and they must deal with it to stay competitive

A common theme emerged from the interviews and was shared among all respondents; sustainability is becoming increasingly popular and important, demanding both attention and resources, and is crucial to survive and be competitive in the industry. In line with public opinion, the companies seem to value the importance of sustainability. There are, however, some variance in both how sustainability is viewed, why it's important and to what degree it's prioritized.

First and foremost, all respondents shared the opinion that a solid stance and measures towards sustainability is crucial to stay competitive. Being able to offer sustainable buildings, reporting CO2 emission accounting/greenhouse gas calculations is becoming increasingly important among customers. As one respondent stated:

> *It is, at this point, quite simply bad business to not have a clear voice towards sustainability. [...] We would not be attractive for our target group, which consists of public and private building developers. We would probably lose quite a few projects had we not had a good sustainability department that could respond to the customers' wants and needs. [...] It has indeed been more and more focus on the topic as of late.*
>
> **– Team leader for an energy department in a large entrepreneurial business**

This statement somehow sums up the collective opinions by the respondents; A stance and opportunity to offer sustainable solutions to customers is paramount to compete and stand as a relevant option to potential clients. Even amongst manufacturers of materials, like the one of concrete, where it perhaps traditionally has been less emphasis and a lessened rate of adoption, it would seem like sustainability in everyday operations is of importance, to stay competitive:

> *It has become more of a focus area as of late, especially in 2021. […] You could say that we have to do these things to be able to show results. You have to measure it, as a supplier in a competitive situation. […] You have to have focus on this from start to finish; both in terms of procurement and other aspects. There is no way out of it - there is an agenda on all this.*
>
> **– Sales manager concrete products in a concrete and concrete product manufacturer**

4.1.1.2 Moral considerations carry some weight as far as incentivizing goes, but they are not considered main drivers

Secondly, as for a more moral standpoint, all respondents had recognized the fact that the building industry is the largest waste generation sector in Norway. Following this, some additional responsibility is put on the actors in the industry´s shoulders when it comes to the environment and social responsibilities. Though this moral standpoint is shared, it does not appear to be viewed as a critical part of why companies decide to act sustainable and gets outweighed by the desire to be competitive in the market. As one of the respondents put it, to make up an answer to the question about which incentive schemes are the most pressing:

> *It is simple: we need a market to operate in. It is from a business economics point of view. […] We want […] to deliver to customers so we could get a bottom line. […]. It does not help if a business that is super on sustainability and social engagement, if they have four deaths a year and have a deficit of 10 million.*
>
> **– Regional manager in a supplier of load-bearing constructs**

Even though all respondents considered the environmental and social responsibilities to be important, they were not as much the driving factor towards their choices. The same results

appear in the questionnaire, where organizational and strategic factors where organizational and strategic factors ranked higher than the morality factor for how the organizations viewed the importance of sustainability.

4.1.1.3 Limited knowledge of the concept of CE, but this is outweighed by the understanding of sustainability

As part of the initial mapping of how the respondents weighed and viewed sustainability they also were asked if they had any knowledge of the term circular economy, and if yes, how the company included circular measures in its practices. While every respondent had a strong sense of knowledge about sustainability, the more concrete concept of circular economy was a bit more lacking. Seven out of ten respondents had a strong sense of understanding of the concept of CE, with four out of the ten practicing some sort of CE. Just under half of the respondents had actual CE measures practices.

4.1.1.4 Relational cooperation between market participants has great influence on the degree of emphasis on sustainability, creating repercussion externally and internally for businesses

Even though all of the respondents expressed a feeling of sustainability gaining attention throughout the market, the lack of focus on sustainability is still present by some customers or suppliers for certain projects.

> *There are certain suppliers that have good sustainability strategies, which we take notice of, and there are ones with less good [strategies], where we try to challenge them. [...] It is rare that I have experienced resistance, but it has happened a few times. [...] There are instances where we have decided to drop a framework agreement, because they expressed that sustainability measures were not necessary.*
>
> **– Head of environment and sustainability in a large entrepreneur business**

When a customer is certain of a decision and is not interested in focusing more on sustainability beyond any minimum requirements, there's little to nothing the contractor can do if they still want to keep the contract. Even though all respondents expressed a high understanding and motivation towards sustainability, a lack of this focus from customers can

itself be a barrier. With that being said, all respondents shared a common understanding that sustainability focus had had an exponential increase in recent years. A sustainable focus and a clear voice towards sustainable solutions among customers will be a driver to a similar focus among the contractors.

4.1.1.5 Summary of stance and general attitudes with respect to sustainability

As sustainability grows in popularity, so does the construction industry´s focus on sustainability. As a key contributor to the waste generation, additional responsibility is placed on actors in the industry, making sustainability an increasing priority. However, the moral incentives are not a main driver, and the sustainability focus is mainly driven by the need to stay competitive. Although the knowledge on circular economy as a concept seems limited, the increasing popularity of sustainability can be shown by the increase in knowledge of sustainability as a concept among all actors. This knowledge and focus on sustainability is reflected throughout most of the parts in the organizations, mainly driven by customers and an external pressure for a clear voice and stance on sustainability as mandatory for competitiveness

4.1.2 Knowledge and competence (RQ 1)

4.1.2.1 Businesses expect public building developers to carry responsibility for increased competence on the subjects and to make demands to business suppliers

Furthermore, the interviewers wanted to look closer into whether knowledge or competence had any impact on whether a business had a strong stance on sustainability or not. Though personally mapping and categorizing each respondent based on their knowledge and competence would be nearly impossible, the respondents enabled a discussion where middle level management could share their experience on the subject. Through these respondents, the respondents communicated a shared view of there being a connection between knowledge and competence on sustainability as a subject and the degree of focus on sustainability within the company. For instance, businesses with their own departments focusing on sustainability showed a broad knowledge and understanding of the term sustainability in the building industry, as well as the nuances within the circular economy. Examples of sustainability being linked with knowledge and competence can be found when looking at industrial flagships,

often public actors, like AVINOR and Statsbygg. These huge companies have the knowledge and financial strength to incorporate sustainability as part of the organizational culture.

> *You have got big "flagships" that make the drive - big public actors - that you expect to be the drivers, like AVINOR, Statsbygg and others. The same with municipalities like Trondheim municipality and Oslo municipality. They make proclamations regarding these issues. They are big organizations with a lot of resources and a lot of employees, and they have the opportunity to hire specialists within this area and they could make demands to us as suppliers.*
>
> **– Project and market manager in a consulting agency**

These findings are true also on an individual level. Most respondents had experienced that the degree of knowledge on sustainability reflected the degree of which sustainability was prioritized. Especially younger generations, where sustainability was incorporated on an educational level, held sustainability in high regard. The older generation, which may have been working in the construction industry for quite a while longer, were more focused on meeting minimum levels and quotas. However, as sustainability becomes more important on the customer side, through seminars and knowledge sharing, this gap reduces.

Especially businesses within big and developed municipalities, where sustainability had a stronger focus, shared the stronger focus on sustainability and its importance. Businesses which operated in more rural areas, where competition was less, the importance of sustainability in each project seemed less important. This train of experience also affected the suppliers for each business. A strong stance on sustainability from builders forced each building and construction business to answer this request, which again forced a similar demand towards suppliers. Suppliers are then being forced to offer sustainable material, or risk being replaced if they are not willing or capable of providing.

4.1.2.2 Lack of cohesion between market participants' level of knowledge, competence and ambition could operate as barriers

As one civil engineer put it, the lack of knowledge "can be a barrier in itself, when clients don't have sufficient knowledge on sustainable solutions". Another respondent emphasizes the lack of systematic work and structurality of this topic in the industry value chain:

> *There is no systematic work on this yet in the value chain. [...] I think it comes down to doing things on your own initiative. In terms of new projects, we are supposed to address sustainability issues. [...] There is no consequence if one does not put any emphasis on it.*
>
> **– Regional manager in a supplier of load-bearing constructs**

In the given context a builder wants a project to result in a sustainable building but does not possess the required knowledge in how to achieve this goal. Another leader of the environment and sustainability in an entrepreneur business adds to this: "We experience more and more customers that have a more active relationship to this when they make orders on building projects, but sometimes they lack the sufficient knowledge". If also the contractor does not have this knowledge, the lack of it would be a barrier to sustainability. On the other hand, if the contractor has sufficient knowledge and competence to achieve this goal, the knowledge of sustainability would be a driver towards an increased focus and a clearer stance towards sustainability.

4.1.2.3 Summary of knowledge and competence

The interviews indicated a not unexpected link between knowledge and competence and the degree of sustainability in businesses. One prominent example was made by industrial flagships, with competent sustainability departments with required knowledge and resources to set examples and demands towards suppliers. There also seems to be a link between the two on an individual level, where younger generations with sustainability more incorporated on an educational level seemed to be more sustainability focused. The lack of knowledge on sustainability can also function as a barrier, for instance when both contractor and customer lack the knowledge to properly achieve sustainable goals in projects, the sustainability result of projects would be limited.

4.2 External factors (RQ 2)

4.2.1 Regulatory considerations

Despite us not defining specific laws and regulations in this thesis, we asked the respondents about the conceptuality of frameworks that revolve around national and international laws and regulations, because the industry is heavily impacted by it. This section is directly related to research question 2. Firstly, we will look at the barriers and drivers for national and international rules and legislation, followed by documentation and certification-demands, and lastly subsidy politics and financing.

Barriers

4.2.1.1 Businesses are dissatisfied with certain national and international rules and legislation, and question its effectiveness; some deem them "too strict", others as "too lenient"

One of the main observations was related to mutual contradictions surrounding the conceived impact these laws and regulations had. Some of the respondents accentuate the fact that national laws and regulations, like TEK ("teknisk byggeforskrift"), have not served its purpose. The Norwegian authorities intended, in part, with this regulation, to make it easier to reuse building materials, and strengthen the regulatory view and facilitate the structure surrounding reusing parts from the building process of buildings and constructions. The respondents we spoke to highlighted fundamental challenges with TEK, but the interesting thing is that, of the respondents that revealed their dissatisfaction, they were dissatisfied on different grounds. They were on two sides of the spectrum: some were dissatisfied due to the regulations being "too soft", which could limit the development to sustainable solutions to incremental ones, at the expense of radical ones, while others underlined that they were "too stringent". The former ones argue that, for businesses to draw their acts to sustainable ones, they need to be challenged - more than what this and other regulations permits today.

> *For example, we would like it to be regulated so that climate emission accounting and reuse mapping [of building materials] is a requirement by law for each project.*
>
> **– Team leader at a large entrepreneur business**

On the other hand, some respondents called for a loosening of regulations, on the basis of the regulations being too strict and too difficult to interpret, and they claimed that they had backing from several industry participants on this point. They admit that the authorities have tried and are still trying to iterate on the demands and some of the wording, to meet the challenges, but emphasize that this is not enough. One of the respondents mentioned that there are some examples of big entrepreneurs in Norway that have had projects where most of the building materials were reused, but without an economic incentive, they argued that they doubted that these entrepreneurs would make this a routine in their future projects.

> *One thing is to run a pilot and test on a smaller scale, but it is whole other thing to do it in scale and properly make it a routine at the large entrepreneurs. You could test how it functions with a pilot to get experience and PR, and that is fine. But for it to become a method human use regularly, it can't be a big barrier. For example, [a big entrepreneur business] is doing a project on building using reused materials, and that is great, but I doubt that they will make this a standard for all their future buildings because it simply is too difficult.*
>
> **– Leader environment and sustainability at building department at a large entrepreneur within building and construction**

Although we do not have statistically significant conclusions that support it, there could be indications that there are distinctions between sub-industries, with regard to their views on national regulations. For instance, one distinction could be on whether they participate in the construction of new buildings or participate in rehabilitation of buildings. It could seem like the respondents that participated in rehabilitation of buildings indicated dissatisfaction, while the respondents that participated in the construction of new buildings were more split in their views.

4.2.1.2 The interpretation of international laws and regulations by Norwegian authorities could serve as a barrier

In addition to national laws and regulations, Norwegian businesses are prone to international laws and regulations, and one of the most pressing ones is the forthcoming EU taxonomy, which will, amongst others, regulate financial aspects, such as investments from creditors and

"green lending". This will be ratified in 2022. Although Norway is not part of the EU, Norwegian businesses would be affected through the EØS-deal. By this stage, sustainable solutions would be rewarded, but at later stages, there could be regulations that set absolute demands for sustainability measurements on projects, and for businesses. This would indeed impact the building and construction industry. In an incentivizing context, there is a point made: EU taxonomy and other international regulations could function as a barrier because national authorities could interpret the regulations from the EU in a too stringent manner. This especially applies to the point on reusability of building materials. It remains to be seen whether the same challenges, that have been mentioned, will apply for the regulations that are to be set in place in the forthcoming years.

4.2.1.3 Summary of barriers in relation to national and international rules and legislation

The respondents underline that some national (such as "TEK") and international regulations (such as EU taxonomy) do not serve their purposes, which is partly to make it easier to incorporate sustainable solutions and to create and align effective incentives for businesses to speed up a transition. There was emphasis that this is not necessarily the case per today, and the interesting observation is that some view the regulations as "too loose", while others think they are "too strict", but both viewpoints serve the same conclusive thought, which marks that these mechanisms could function as barriers. Furthermore, one remark relates to the fact that national authorities and regulators interpret international regulations too strictly, which could weaken this outlook even more. Moreover, some respondents call attention to the fact that regulations make it more expensive, partly due to documentation demands and extensive testing of materials. As a last remark, there are some signs that there are sectoral differences in terms of viewpoints, for example differences between businesses/departments participating in building new buildings and constructions and businesses/departments participating in rehabilitation.

Drivers

On the flipside, there are numerous factors that expedite as drivers for sustainable solutions.

4.2.1.4 Regulations could be effective as businesses need to adapt, creating structural predictability and potential enhancement of system thinking

International laws and regulations, such as EU taxonomy, as briefly mentioned earlier, could function as a driver, because regulators have regulatory power, and the businesses do not have a choice - they need to adapt. In addition, some argue that it makes it easier for businesses to choose sustainable solutions. Furthermore, the fact that some departments (that traditionally have had limited emphasis on sustainability, like economic departments in some businesses) are forced to be more involved, according to some respondents. This could be an enforcing driver that has several effects: firstly, this could lead to a strengthening in terms of financial enabling, potentially causing predictability for all stakeholders in the business. Secondly, in itself, this could induce a stronger affection in the organizational culture and structure of each business, increasing "corporate accountability" and a social conscience surrounding which choices each employee should take. For example, one of the respondents addressed the fact that EU taxonomy has brought in "climate adaptation" as a concept into projects. Climate adaptation is a means to plan and execute actions to deal with natural hazards and other challenges posed by climate change. In practice, this means for example that businesses would need to do scenario analysis for different climate scenarios, and possibly iterate their existing solutions.

> *Our customers point to EU taxonomy when we are setting up a building. We need to make scenario analysis for climate adaptation in the future. When you simulate for different energy mixes and so on, you could have one scenario where it is 3 degrees hotter outside, and dimension accordingly. So, that is exciting.*
>
> **– Team leader in a large entrepreneur business**

4.2.1.5 A "carrot-and-sticks" approach from national regulators could be effective, partly due to its signaling effects and monetary incentivizing

Growing demands from regulators, be it national or international, is warranted, as stated by some respondents. Several respondents point to the effectiveness of a "carrot-and-sticks" incentivizing approach from regulators, emphasizing that punishment in itself and the signal effect that follows, could function as drivers. This is a fascinating observation, given the simple intuition behind this type of incentivizing, remarking some of the dynamics in these

topics. The most pressing argument, as stated by these respondents, involves those monetary incentives are given less weight, because it is oftentimes far cheaper to buy new materials and demolish, rather than the alternative of reusing materials and rehabilitating buildings and constructions. Some respondents listed examples of difference in costs, where one of the most extreme examples showcased that it was 6x more expensive to buy reused materials, than it was to buy new ones. Because of this, these respondents think that regulators would need to use their regulatory tools (such as iterating "teknisk byggeforskrift"), to drive businesses in the direction of sustainable solutions, pinpointing regulations surrounding reusability of building materials (which is heavily tied to the documentation demands and the effects of this), and to incentivize green transportation and building sites in general. This is, of course, complex and has to do with a series of interconnected and progressive grounds, which is one of the objectives with this thesis, to showcase. Thus, the incentives and the systems surrounding them that we are displaying can not necessarily count for the entire web of factors that are supposed to make up for these causal effects.

4.2.1.6 Independent regulators could reinforce pressure to clients by notifying them about their suppliers' sustainability measures

Another interesting observation we made from the interviews were mentions of independent regulators, and their (potential) impact on businesses. One respondent pointed out that his department in the business was subdued to scrutiny from an independent regulator, that, in part, follow up environmental regulations made by the authorities. Though, this independent had no direct ways to sanction breaches, other than alerting building developers if there was one or several serious breaches. Which brings to light that regulators, apart from their isolated influence as a regulator, could use their regulatory power to reinforce the relationship between actors in the value chain to put pressure on one another. Nonetheless, this could also be a means to drive businesses to sustainable solutions.

4.2.1.7 Summary of drivers in relation to national and international rules and legislation

Regulators, national and international, could, largely because of the dynamics of this industry, use their regulatory power to enforce changes. This could have several effects:

organizationally this could enforce economic departments in businesses to have a proactive relationship to sustainability, and economically this could lead to a strengthening of certain departments internally and on sustainability measures in general. As well, the respondents emphasized the effectiveness of "carrots-and-sticks" incentivizing from regulators, and the fact that independent regulators could put pressure on market participants by reporting to their adjacent customers, if businesses breach sustainability regulations.

Barriers

4.2.1.8 Documentation demands often lead to costly sustainability, hindering and disincentivizing businesses to choose sustainable solutions

As a continuation of the points that made out the barriers of national and international laws and regulations, most of the respondents touched upon challenges with documentation demands. One of the points that was made, was related to the fact that the respondents concluded that costs related to documenting which materials are used and its traits. If we take the example of bricks as a material used in the building process.

> *I don't know the regulations surrounding reuse of materials in detail [...], but I have attended some breakfast seminars and talked a bit about it, and repeatedly hear that the regulations surrounding using existing products are too strict. It becomes too difficult. For example, some use bricks that cost 6 times that of new ones, because they need to be cleansed and tested extensively afterwards.*
>
> **– Leader environment and sustainability in a large entrepreneur business**

4.2.1.9 The structure of BREEAM-certifications causes for challenges for businesses due to "environmental" criterions are not required

Another concrete example that some of the respondents mentioned was related to climate certification, where BREEAM-certification is the most prominent one. This is a tool to certify and document environmental performance on buildings based on nine categories - management, health and indoor environment, energy, transport, water, materials, waste, land use and ecology, as well as pollution. They are graded on points that make up five levels, from "pass" to "outstanding". Of these categories, each entrepreneur chooses which sub-points he

or she wants to focus on, and one concern that could function as a barrier is exactly this. If the entrepreneur wants to aim for a lot of "material points", for instance, he or she could do what is in their power to reach these goals and score the point. But that is not necessarily the case. Because the demands on documenting are so high, many choose not to "go for" these points, which could pose a regulatory challenge - the entrepreneurs do not have enough incentives in the certification-process to follow through with the full potential of sustainable and environmentally friendly solutions. To mitigate this challenge, some of the respondents introduced that all points in the BREEAM-certification should be a requirement, rather than a choice, and thus increase the threshold of the highest results that the certification could give and bring an incentive to the businesses to have even higher ambitions regarding specific measures.

> *Regulators are trying with new certifications and new demands. They are coming. But in reality, in a circular perspective, this is difficult, because the demands are too high. So, they are trying to adjust on rules and legislation, but it is demanding.*
>
> **– Division director at a consultant agency**

4.2.1.10 Summary of barriers in relation to documentation demands and certification

One of the most prominent points made is that documentation demands in relation to sustainability measures serve as a costly means, amongst others because of additional costs related to cleansing, testing and documenting, according to the majority of the respondents. Moreover, several mentioned that, in the certification process with BREEAM-certification, businesses lack incentives to "go for" sustainability goals, partly because the demands are optional, and the businesses could get a decent overall certification without emphasizing on all regions of the certification.

Drivers

4.2.1.11 Standardization of documentation demands create valuable predictability, as well as other positive side effects as inactively focusing on sustainability in daily operations

At the same time, the respondents revealed that documentation demands could function as a driver for sustainable solutions. A specific example that was frequently mentioned associated with EPD's (Environmental Product Declaration), which are environmental declarations that summarize the entire "environmental profile" of a component or a finished product. Amongst others, public customers, who have tenders to assess the different entrepreneurs and contractors, require this. Consequently, entrepreneurs and contractors would need to address this when dealing with their own and sub-contractors' materials. In this way, according to some of the respondents, the regulators have sped up the transition to sustainable solutions by incentivizing businesses to have internationally renowned and standardized, to meet customer demand. This does also apply for private customers, but it could seem like it is not as incorporated as in the public sub-sector.

> *Climate certification [...] has come a long way. In 2019 we went from truly understanding the value of this. We are now trained in this and have developed a more thorough understanding and implemented it in our operations, with EPD's, for instance.*
>
> **– Sales manager in a concrete and concrete product producer**

This could also bring with it other positive side effects, like the one of life cycle assessment, because the EPD's are based on life cycle assessment of components and finished products. This could in itself function as a facilitator, because it could integrate a fundamental understanding of life cycle assessment, which in turn could shape the intuition and stance surrounding how components and finished products are to be treated and be a self-enforcing mechanism that drives more sustainable choices. One of the respondents underlined that regulators have eased some of the considerations by standardizing for instance climate certifications, which ISO-standards is a testament to.

4.2.1.11 Tools like "digital twins" could be a helpful driver; some businesses call for regulatory frameworks to speed the transition

In addition, to cope with the challenges related to documentation demands, some respondents presented "digital twins" as a possible solution. Put simply, "digital twins" are digital reconstructions of things that exist in real life, and in this context, we are mainly speaking about reconstructions of buildings. Although we could not find any evidence where the

authorities have addressed "digital twins" in relation to concrete regulations, these respondents pointed out that if or when this gets regulated, this could function as a driver, because it is an increasing demand and consequently embodiment in the market.

4.2.1.12 Summary of drivers in relation to documentation demands and certification

Regulators have simplified documentation demands in terms of creating and adopting standards of material handling by implementing for instance EPD's. By standardizing the requirements, this has led to them being internationally renowned, and in turn this could have a network effect. If one supplier implements EPD's, this makes it easier for the next supplier to implement it as well. Another effect EPD's could have, relates to organizational attitude: by assessing business operations in a life cycle perspective, this could function as a further driver. In addition, the introduction (and soon to be the strategic definition by the authorities) of "digital twins" serve as another example of an enabler of sustainable solutions.

Drivers

4.2.1.13 Monetary incentives, through public subsidies and loans, are of utmost importance. They could create direct financial support, as well as setting concrete demands to businesses

Additionally, a large portion of the respondents underlined the importance of subsidy politics from national and international regulators as a potential enabler, because they are closely linked with monetary incentivizing. Nationally, the contributions of ENOVA (a public entity that, amongst others, facilitates financial contributions to measures in relation to lower carbon emissions), have functioned as a transitionary. ENOVA does this by both making contributions by subsidies and loans, which could make investments more attractive for entrepreneurs and sub-contractors. Several of the respondents touched upon the fact that ENOVA not only provides favorable (new) loans, but also makes better existing financing, with better loan conditions (e.g., size of loan and/or lower interest).

> *For example, ENOVA has introduced potential subsidies to concepts like "emission free building sites". There are quite a few building developers that are emphasizing sustainability more due to financial support. [...] that is a good thing.*

Internationally, EU taxonomy, brings with it "green loans". There were two main points of this: firstly, the respondents remarked on the fact that the EU will make the criteria of environmentally friendly buildings standardized. Thus, regulators would set a standard, where eventually there would be "market thresholds" of what is defined "good" and "bad" in terms of sustainability of buildings and building processes. This could incentivize businesses in a market context, because it is attractive to be perceived as a business beholding a leading place when it comes to sustainability. In addition, by providing better and more predictable terms for disposable equity and debt, suppliers could cut costs in their operations, and in turn incentivize customers, by offering lower prices.

4.2.1.14 Summary of drivers in relation to subsidy politics and financing

It seems like monetary incentives, like subsidies and terms of debt financing both serve as drivers. Respondents for instance highlight that businesses could apply for larger investments and subsequent financing, as well as the fact that businesses could get better existing financing. Organizations like ENOVA are important in these processes. In addition, by standardizing the definition of environmentally friendly buildings in the process of applying for financing, regulators have created an incentive for businesses, because implicitly this creates thresholds for different buildings and projects for what is perceived as environmentally friendly. If there are tiers that state that businesses are best in class in terms of sustainability, there is reason to believe that more businesses will make a stretch for sustainable solutions.

4.2.2 Supplier considerations

As a vital part of the value chain, suppliers have notable influence on adjacent businesses, both as a hurdle and an enabler.

Barriers

4.2.2.1 Traditional supply-and-demand mechanisms could function as barriers when there is a symmetric information stream, challenging the need for same-level sustainability aspirations for client and supplier

Possibly the most obvious rationale that could function as a hurdle has its origin in "supply and demand" mechanisms. "Suppliers actually need to offer environmentally friendly products and services", was a common phrase from the respondents, which makes intuitive sense. From the perspective of entrepreneurs and other contractors: if end-customers, like building developers, demand such solutions (and the entrepreneurs need to hire sub-contractors), it could be difficult to offer such solutions if the sub-contractors (i.e., suppliers) do not offer them. Also, in the context of this challenge, another challenge could arise. The question is: as entrepreneurs and contractors (i.e., customers of sub-contractors), who is supposed to take the first step? Is it the sub-contractor and suppliers, or end-customers? If we take a simple prerequisite and assume that the market participant that is the first mover has to take an economic hit (based on the assumption that states that sustainable solutions per today are more costly than the alternative), this could pose a barrier. If all the market participants are aware of the same negative consequences this could be a deterrent.

Furthermore, several respondents reported that some suppliers do not have the same set of competence, attitude and ambitions, in terms of sustainability measures on projects. This, in turn, could lead to slowing of the transition of sustainable solutions, because entrepreneurs and contractors could for instance be tied contractually in certain projects, and have limited influence on these specific projects. Communication between the parts could, at the utmost consequence, worsen the development. We acknowledge that oftentimes the situation is more nuanced than the one pictured, but still want to outline some contextual incentives in this manner. Although they emphasized that such suppliers are few in numbers, just the observation that environmentally friendly could be an absolute criterion for suppliers, is an interesting one.

> *Suppliers' level of knowledge could vary extremely. It is almost to the point where we have to address "do you know what you are talking about?". [...] It is important to us, at least in relationships with building developers, to realize what they actually want. When they say, "we want something TEK10, just throw in some windows, whatever", it is simply not enough.*
>
> **– Team leader energy at a large entrepreneur business**

4.2.2.2 The participants of the first stages of setting up buildings, designers, and architects of the building, have traditionally had less emphasis on sustainability

Suppliers, like architects and designers, could also pose a threat and function as a barrier, if we are to believe some of the respondents. Because of their line of work, they often have their involvement in the introductory phases of building projects, creating and sketching before the actual construction is set in motion. Thus, they have a distinct area of control when it comes to how solutions are designed and utilized in the later stages of the project management phases. This especially applies for the final life cycle stage of buildings, that relates to demolition. For example, today, it is still somewhat challenging for entrepreneur businesses to reuse materials, partly because the current solutions do not facilitate it. Architects and designers could therefore function as a barrier because of the lack of systematic work, according to some respondents. A part of this could have something to do with the fact that the majority of entrepreneurs and contractors have historically demanded solutions, making it yet another self-enforcing hurdling mechanism. Lastly, several respondents pointed out that some suppliers also participate in the market mechanism mentioned earlier, characterized by a self-enforcing apparatus, where it ends up being too cheap to choose non-sustainable solutions. This applies especially in terms of the recurring theme of reusability of materials, where the monetary incentives simply are weighted in the direction of utilizing new materials, rather than to reuse. To illustrate, one respondent discussed this concept in more depth, using the "fast, cheap, good" principle, which relies on a trade-off between the three depths when making (sustainable) business decisions. In practice, she claims that initially on projects, more often than not, both parties are more or less in tune surrounding the level of ambition, but as the projects go on and the parties get pressed on budget, the level of ambition often gets less priority. She refers to the fact that, in the case of budget and time constraints, suppliers tend to prioritize "fast" and "cheap", at the expense of "good".

> *You got "fast, cheap, good" - you could only choose two [options]. This means, that in order to reduce the use of resources to the business actors, you have to say "if the use of materials is supposed to go down, and you want fewer overall costs", this will demand more working hours internally. [...] It is incredibly important to evaluate the connection between time, costs and use of resources.*
>
> **– Department manager for architects at a consultant agency**

4.2.2.3 Time constraints for suppliers could in some instances be a hurdle to overcome

Another point made was related to the fact that in the largest entrepreneurs, there are thousands of suppliers, so in practice it is difficult to follow-up this in every sub-project and every offer, but to partially mitigate this problem some have introduced and implemented status-meetings with the biggest suppliers (e.g., suppliers of steel and concrete) - that buy in large volumes. Although they have done this with respect to standard operational focus points for some time already, some have also implemented the aspect of sustainability in these status-meetings; several respondents mention that sustainability has become a larger portion of the substance in these meetings.

4.2.2.4 Summary of barriers related to supplier considerations

Supply and demand market mechanisms could function as a self-enforcing apparatus, where, in the case of customers not demanding sustainable solutions, suppliers do not offer sustainable solutions, their customers won't offer it. If one also assumes that the parties are under the same assumption of that sustainable solutions are more expensive than alternatives, there could be a barrier in the crosshairs of the question regarding who is going to take the economic hit. There could also be a significant difference in competence, attitude and ambitions surrounding sustainable solutions on each project, which could slow the transition between customers and their suppliers. Structurally, could there also be difficulties. Some respondents underline that some suppliers, in the likes of architects and designers, and other suppliers that work in the early stages of projects, traditionally have not had a systematic approach to setting up sustainable solutions when drawing and designing systems attached to products and services used in the building process. This could have to do with a prioritization of considerations that products and services should be "cheap" and "fast", oftentimes at the expense of "good".

Drivers

4.2.2.5 Customer purchasing power and inter-relational cooperation could act as enablers when on the same page

While, at the same time, customer purchasing power and inter-relational cooperation could act as enablers of the transition towards choosing sustainable solutions. For example, to an increasing degree, some respondents point out that suppliers are aware of the use and are

utilizing EPD's more, due to leveraging from customers. This could in turn influence incentivizing and promoting sustainable solutions. Another typical example relates to BREEAM-certification. Suppliers and customers must cooperate to finalize target points in the certification process. Consequently, if the customer has high ambitions for environmental impact on the project, this could function as a driver.

> *When we are setting up buildings that are about to be BREEAM-certified, we wish to choose suppliers that are familiar with BREEAM [...]. If we got a project with high ambitions on sustainability, we wish to work with other actors with the same level of ambitions.*
>
> **– Leader environment and sustainability in a large entrepreneur business**

Oftentimes, large public building developers make a stretch for good certifications. Accordingly, entrepreneurial and contracting suppliers get pressed on these kinds of issues. The majority of the respondents we spoke to underlined that they had a desire to, not only meet certain criteria and targets for sustainability, but surpass them (on at least some of the criteria and targets). Specifically, one of the respondents emphasized that their business department proactively asks questions regarding environmental goals for each project. By thinking in a life cycle perspective, they defined at least three sub-processes where this became evident: firstly, there was the project start-up phase, where the parties agree on the size of the building and how much is going to be built. In these early discussions, they have notable relative customer purchasing power. Secondly, there is the delivery phase, where the customer could leverage their purchasing power by demanding sufficient documentation in the examples of FDV-documentation and/or "digital twins". By doing this, the customer facilitates the ease of replacing single elements in the buildings, in order for them to broaden the elements' user-cases, even in the last phase of the building life cycle.

> *The construction industry tends to view the building itself with respect to environmental measures. When the building lets out carbon emissions, this is what applies. At the same time, what we as architects work with, is about processes where we can teach people to use the same areas for several purposes.*
>
> **– Department manager for architects at a consultant agency**

Finally, there is the liquidation/demolition phase, where the customer could influence the supplier to take into account recycling and reusability considerations. By thinking strategically and having a systematic approach to these processes, this could, in isolation, further accelerate the process.

4.2.2.6 Less dependence on global supply chains and more predictability in supply lines could work as incentives for local production; clients could be more willing to pay a premium for this and act as another self-enforcing mechanism

Moreover, as a direct consequence of the COVID-19 crisis, there has been clear indications of supply chain issues, which has influenced incentivizing participants in the value chains, also in the building and construction industry. Some suppliers (as well as their customers) have experienced repercussions of being a part of an increasingly global entangled supply chain, which is dependent on each other. If and when one of the participants in the value chain, for some reason, does not have the opportunity to deliver products and services to their adjacent customers or partners, these customers and partners get affected. This is one of the main points attached to suppliers from the interviews. This in itself (i.e., the symbol effect and the actual strategic and economic ramifications this causes), could be a driver for sustainable solutions, if one assumes that the alternative is local production. This could cut the dependability of global transport, and to some degree, change the mix of energy resources used to produce elements and finished products - from fossil fuels to renewable energy sources. One respondent also mentioned that this could lead to more predictability for supply lines (i.e. better planning: potentially less energy usage/less transport internally etc.). A mechanism that further could function as a self-enforcing one in the value chain is that of the willingness to pay; it might be that local production could lead to a higher willingness to pay for customers from a strategic point of view.

4.2.2.7 Summary of drivers related to supplier considerations

By using customer leverage, suppliers are pressured to choose sustainable solutions. Inter-relational cooperation, and the fact that customers and suppliers need to work together at each stage of each project, could in turn make it easier. If customers also use their influence at suppliers by providing a system thinking in the context of business operations, this could further speed up this process. Additionally, characteristics with respect to the supply chain

could in itself be a driver. To highlight the dependability of Norwegian businesses of global production, this could function as an enabler, because businesses could realize that it is more advantageous to produce locally. This way, these businesses could argue to their suppliers and customers that it is more environmentally friendly by cutting the need for global transportation lines and to a certain degree a better energy mix in production. In the end, this could also lead to a higher willingness to pay for customers, because of strategic considerations.

4.2.3 Customer considerations

Barriers

4.2.3.1 Less willingness to pay for sustainable solutions from clients could function as a barrier

As a vital part of the value chain, customers correspondingly have potential significant influence on the choices of adjacent stakeholders, such as suppliers and partners. Several of the respondents highlighted that customers, as well, would need monetary incentives for choosing sustainable products and services. In the cases where these are absent, it could constitute a barrier. This refers to a point made earlier; this could amplify the problem - customers do not have the willingness to pay for such solutions, and thus suppliers have less monetary incentives to offer such products and services, and it becomes a self-enforcing movement in circles.

4.2.3.2 Procurement processes could pose as a threat as they often are structured in a way to incentivize less emphasis on sustainability

In the case where public entities are the customers, in the likes of “Statsbygg”, “AVINOR”, municipalities and county municipalities, three other challenges occur, which was identified during the interviews. Public entities (as well as a lot of private ones) operate with tenders when reaching conclusions for who is going to be picked for each project, for example. These tenders are based on different criteria’s, along the lines of “quality”, “price” and “environmentalism”. The first problem that was identified was related to the fact that these criteria are weighted skewed, where “environmentalism” currently often is given little to no

weight in practice. Three of the respondents either emphasized that these criteria are given no weight at all in practice, or a limited weight, to the degree that it has no practical meaning.

> *In a competition situation, and there are costs related to sustainability measures that one wishes to implement, "sustainability" can't compete as a procurement criteria. Price weighs 70-80 % of the overall assessment.*
>
> **– Civil engineer/consultant at a consultancy agency**

As a continuation of this problem, in the cases where "environmentalism" actually does get properly weight in the assessment of the tenders, it does not seem to have a real effect, because there are no sanctions set in place if you (as a supplier) do not meet the criteria you stated you would meet. It is still, oftentimes, trust-based, and in the hands of the supplier. The symbol effect is very limited, according to some of the respondents.

> *I feel like [suppliers] could make promises, and after all, they don't necessarily use electric machines. They promise to use it [...], but they don't really have it available. And there are no sanctions in relation to it anyways. At this point, you know that you could simply lie to get the job, [...] and one has come just as far.*
>
> **– Leader external environment in a large entrepreneur business**

The third challenge also arises in the case where "environtalism" does get given weight in the assessment. Although, this problem relates to the fact that suppliers oftentimes are able to offer the same solutions under the "environmentalism" criteria, nulling out the effect this has on the overall evaluation of the offers.

> *One of the most important things is that customers use it as a procurement criteria. [...] But if the building developers score each procurement offer the same on the procurement criteria, [...] it won't be of practical use.*
>
> **– Leader external environment in a large entrepreneur business**

4.2.3.3 Budget constraints, although perhaps obvious, could serve as a barrier, especially for for-profit businesses partly due to viewing sustainability as less a priority than non-profit organizations

Additionally, as touched upon previously, if the customer does not have the sufficient budget

or financial strengths to implement or create sustainable solutions in their offers and operations, this could function as a hurdle. A common phrase, from the customer to the supplier is “we hear what you want, but because of your budget, maybe we could suggest these solutions instead”. Yet again, there could seem like there sometimes is a distinction between private and public customers. More often than not, private customers seem to not have the willingness to pay, while public entities to an increasing degree, have more purchasing power. This could have something to do with the fundamentals that make up the incentives stirring in public entities and the domain they operate in. Put in simple terms, private businesses are incentivized by capital. For instance, a joint project with a large entrepreneur had 30 % extra costs because of sustainability measures, which makes a valid argument for this. To quote one of the respondents, who is a department manager for architects at a large consulting service business: “The private ones don’t consider it as a choice, but as a means to survive”. To exemplify, there is reason to believe that few renters of office buildings would like to rent offices without BREEAM-certification or other sustainability measures. On the other hand, public entities have several purposes. Amongst others, these are often subdued by political influence, with purposes surpassing monetary ones, such as the consideration for the climate.

4.2.3.4 Summary of barriers related to customer considerations

As a continuation of the problems arising on the supplier side, much of the same ones apply for the customer side. In essence, if customers do not have the willingness to pay for sustainable solutions, suppliers have less monetary incentives, and this could in turn be a self-enforcing circling of challenges. Another significant observation deriving from the respondents have to do with how customers and suppliers are chosen, which oftentimes are through tenders. There are some weaknesses in these processes, if we are to believe some of the respondents. Firstly, in practice, sustainability measures are given less weight in the tenders, and secondly there are seldom any sanctions set in place, if the promises regarding sustainability are not upheld.

Drivers

4.2.3.5 Public clients have a relatively high willingness to pay for sustainable solutions and require competence from suppliers, speeding up a transition

At the same time public entities could in certain instances act as a barrier, at large, they also act as enablers. Almost all of the respondents identified that customers are one of the main drivers. The majority of the respondents underscore that public building developers, especially Statsbygg because of its sheer size, play a big part in pushing for sustainable solutions. Although there are possible flaws with, for instance, the tender processes and criteria, there are positives. Some of the building developers require competence and makes it easier to be more ambitious with climate goals, and they utilize their purchasing power. For example, there was a potential customer in one of the largest towns in Norway that demanded that the process of setting up each building should have no carbon emissions in the operational phase. These respondents continually emphasize the difference between public and private customers. "Private companies are more "laggards", but they will eventually also incorporate this in their operations as well". One of the main points made about private customers was that they do not consider it as a choice, but as a means to survive. Consequently, this could function as a separate incentive. One of the respondents put it this way:

> *Public clients are characterized more by alternate missions, such as political demands and national responsibility etc.*
>
> **– Civil engineer/consultant water and sewage at a large consultant firm within engineering, planning and architecture**

Furthermore, to an increasing degree, several respondents mention that a large number of these public building developers have a willingness to pay a premium for sustainable solutions, even though it is not necessarily at the wanted scale yet, according to some of the respondents. As well, municipalities and county municipalities are supposedly some of the main drivers for real change in using such solutions. A common phrase was that "we experience that more and more customers have a more active relationship to this when they make orders on building projects [...].

4.2.3.6 Pressure in the value chain could act as an enabler, potentially strengthened by business' need to be viewed as "sustainable"

In turn, pressure in the value chain is a self-enforcing driver. One of the respondents said "if our customers demand it, we will need to turn to our suppliers and demand the same". One example that was mentioned was the course of action towards fossil free transport on the

building site. The suppliers increasingly offer suitable solutions. This could also have something to do with the customers' reputation themselves. Some respondents pointed out that it gets expensive to ignore sustainable solutions. As mentioned earlier, for example, a commercial building without climate-certification is a lot harder to rent out, and the potential brand and reputation backlash could be of utmost negative consequence. In addition, one respondent specified that by introducing a more sustainable recipe for their concrete production, they have received less complaints from customers, which in itself also could function as a driver. Customers could also use sustainable solutions as a means to differentiate themselves and create a competitive advantage in their markets. To illustrate this, one of the respondents said:

> *We would like to demand these solutions in the market before they become regulations. There is a tough competitive landscape for consultancy agencies. We have a lot of competitors which are quite similar to us, so we have to differentiate.*
>
> **– Manager for projects and markets for the climate department in a large consulting firm within engineering technique, sustainability and social economics.**

4.2.3.7 Summary of drivers related to customer considerations

Customers also function largely as enablers of sustainable solutions. Firstly, there are numerous effects of public entities being clients. They could have ulterior motives than private ones, oftentimes pondered in moral incentives as they are socioeconomic inclined to. This could lead to them having the necessary purchasing power, and a willingness to pay a premium in the instances where sustainable solutions constitute this. Secondly, pressure in the value chain and customer leverage could be an additional driver, as customers could use their influence in all operational processes alongside suppliers, finally aligning the incentives for suppliers and customers altogether.

4.3 Internal factors (RQ 3)

The internal factors are categorized in two different categories: moral and organizational/strategic. Believing the internal motivations was a combination of the two, the interview and questionnaire wanted to identify if this was the case, and in what way moral and organizational/strategic factors affected work towards sustainability. This section is directly related to research question 3.

4.3.1 Moral considerations

The internal moral motivation was categorized as an internal desire to be good. Examples would be to act in sustainable manners with future generations in mind, taking care of the environment and social responsibility to name some. That being said, it can be difficult to differentiate moral and strategic incentives, given the fact that these often co-exist and strengthen each other. For example, taking social responsibility as a business, and preserving the environment will send a signal to the public, potentially increasing public image in a positive way, and therefore be considered to have a strategic incentive in doing so. The interview tried to distinguish the two by questioning the respondent on both angles, as well as using the questionnaire to differentiate and receive ratings on both topics.

As a common theme all respondents expressed the fact that morality was important, but the opinions on whether it functioned as a factor to act sustainable was much lower.

> *To work sustainably can lead to us winning jobs, so it is absolutely a motivation. However, if sustainability focuses solely for the sake of reputation, I don't think it's good enough. It is important, but not important enough as a motivation.*
>
> **– Leader external environment at a large entrepreneur business**

Two of the respondents brought up how much of the internal motivation was directed in the business from the company owners, with one regional manager ranking the owner's direction on sustainability as the main incentive to act sustainability in that company. A strong direction of the owners enabled a culture in which sustainable measures were prioritized. The owner's stance created a culture in which created sustainable staff functions and sustainability

managers which put pressure on the topic throughout the company. It can, however, be discussed whether this pressure from above created a culture for internal motivations or a guideline in which employees had to follow. The same regional manager would rank strategic and organizational motivation as second, moral considerations third and social responsibility as a "sour fourth place, unfortunately".

4.3.2 Organizational and strategic considerations

Unlike the moral incentives, the organizational and strategic internal incentives were considered strong motivations towards sustainable work on each business.

4.3.2.1 Competitiveness

The undisputed most important internal factor among the respondents was the ability to be competitive, which was mentioned by all respondents. As with the external factor customer, the ability to meet market demands and stay relevant in the industry was considered paramount, and the main driver of internal incentives. As the market became increasingly focused on sustainability, lacking the option to offer sustainable solutions compared to the competition could mean the difference between gaining jobs or losing them. It simply became a necessity to at the bare minimum be able to meet the average sustainability demands set by the industry, with focus on sustainability growing exponentially.

Additionally, an increase in building projects that exceeded the bare minimum of sustainability demands put an extra incentive to increase focus on sustainability to stay competitive. Being able to take on these more sustainable projects enabled competitiveness on a broader scale, giving the opportunity to partake in a wide range of projects with different focus on sustainability. Also, with the increasing focus on sustainability in the industry as a whole, staying on curve with this evolution secured a higher chance of securing competitiveness in the years to come.

4.3.2.2 Attractiveness as an employee

One other driver that weighed heavily towards sustainability was the possibility of attracting new employees. Attracting talent and capable employees could also be a factor in staying

competitive. This was brought up as an incentive by 4 of the respondents, which also came across as the once more focused on sustainability out of the respondents.

> *Why our company thinks it is important with sustainability among our employees is because we are to attract graduates, and we are to attract those who have been working a few years. There is not any doubt about the fact that for the generations to come, it is extremely important to work, at least for most, with a company labeled as sustainable, and has a clear statement in relation to it.*
>
> **– Market and project director, environment and waste**

As discussed in the knowledge and competence section of the analysis, the increased awareness and focus on sustainability by younger generations is also taken into consideration as a factor to be an attractive employee. As the market and project director said, graduates appreciate and seek work in businesses with the same amount of sustainability focus as themselves.

4.3.2.3 Credibility among customers

In combination with the internal incentive of being competitive, credibility is one incentive brought up by one of the respondents:

> *In regard to the customers, we can't meet customers with credibility that we should be the ones to advise them on sustainability, if we do not comply with it ourselves. We need to sweep at our own door.*
>
> **– Market and project director, environment and waste**

With sustainability gaining ground, also among competitors, being able to show self-compliance as the once one advice seems intuitive, showcasing a possession of competence and credibility on the subject, consequently going hand in hand with the incentive of achieving competitiveness.

4.3.2.4 Internal measures for cutting cost

One motivation to increase focus on sustainability emerged during the interviews as economic gains from organizational structure focusing on sustainability. Reusing and repairing office supplies, repairing instead of buying to pc equipment and less travel were examples given as more sustainable solutions that cut cost within the company. Especially less travel and a substantial increase of digital communication internally and between company and client was one measure that had a significant impact on both costs and environment. It is worth mentioning however that only two out of the ten respondents mentioned internal financial savings as an internal incentive, with this incentive not being an important driver in itself. Additionally, both respondents would credit COVID-19 as the main reason for less travel. Despite COVID-19 being the main reason for increased digital meetings and less travel, the respondents explained how the pandemic had opened the company's eyes on how digital meetings as a substitute for travelling could be just as effective in addition to cutting cost and being environmentally friendly.

4.3.2.5 Summary of internal factors

Shortly after the interview as part of the questionnaire the respondents were asked to rate the importance of factors within moral and organizational/strategic internal motivations. Following table shows the results of these ratings on a scale from 1-5.

Table 3: Illustration of questionnaire answers by respondents on internal incentive structures

#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	Empathy for forthcoming generations	2.00	5.00	3.20	0.87	0.76	10
2	CSR-considerations (Corporate social responsibility)	2.00	5.00	3.70	1.10	1.21	10
3	Reducing climate footprint	1.00	5.00	3.90	1.22	1.49	10

#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	Profitability	2.00	5.00	4.10	0.83	0.69	10
2	Attracting talent	3.00	5.00	4.00	0.63	0.40	10
3	Increased competitiveness	2.00	5.00	4.70	0.90	0.81	10
4	Innovating business model	3.00	5.00	4.10	0.70	0.49	10
5	Organizational culture	4.00	5.00	4.30	0.46	0.21	10
6	Organizational reputation	3.00	5.00	4.30	0.64	0.41	10
7	Product development	2.00	5.00	3.90	0.83	0.69	10
8	Top management motivation	3.00	5.00	4.70	0.64	0.41	10

As seen in table 3 the organizational/strategic (second half) incentives were ranked higher than the moral incentives. Product development, the least important strategic incentive being as important as reducing climate footprint, the most important moral incentive. The moral incentives averaged on a mean of 3,6, while the strategic and organizational incentives averaged on a mean of 4,26, which complies with how the respondents viewed the internal incentives during the interview.

Even though all respondents expressed internal moral motivations to be a part of the drivers towards sustainable work, all respondents ranked organizational and strategic motivations as more important and a bigger driver towards sustainability. Though taking care of the environment and future generations was nice in itself, making money and profits are paramount in order to survive as a business, and moral factors could not be achieved at the expense of profit. In some instances, these drivers are intertwined and connected, with a sustainable focus to increase competitiveness. When they are not, the bottom line is the driving factor, while moral motivations, like taking care of future generations for instance, was not a big enough driver in itself.

4.4 Weighting of the incentive factors (RQ 4)

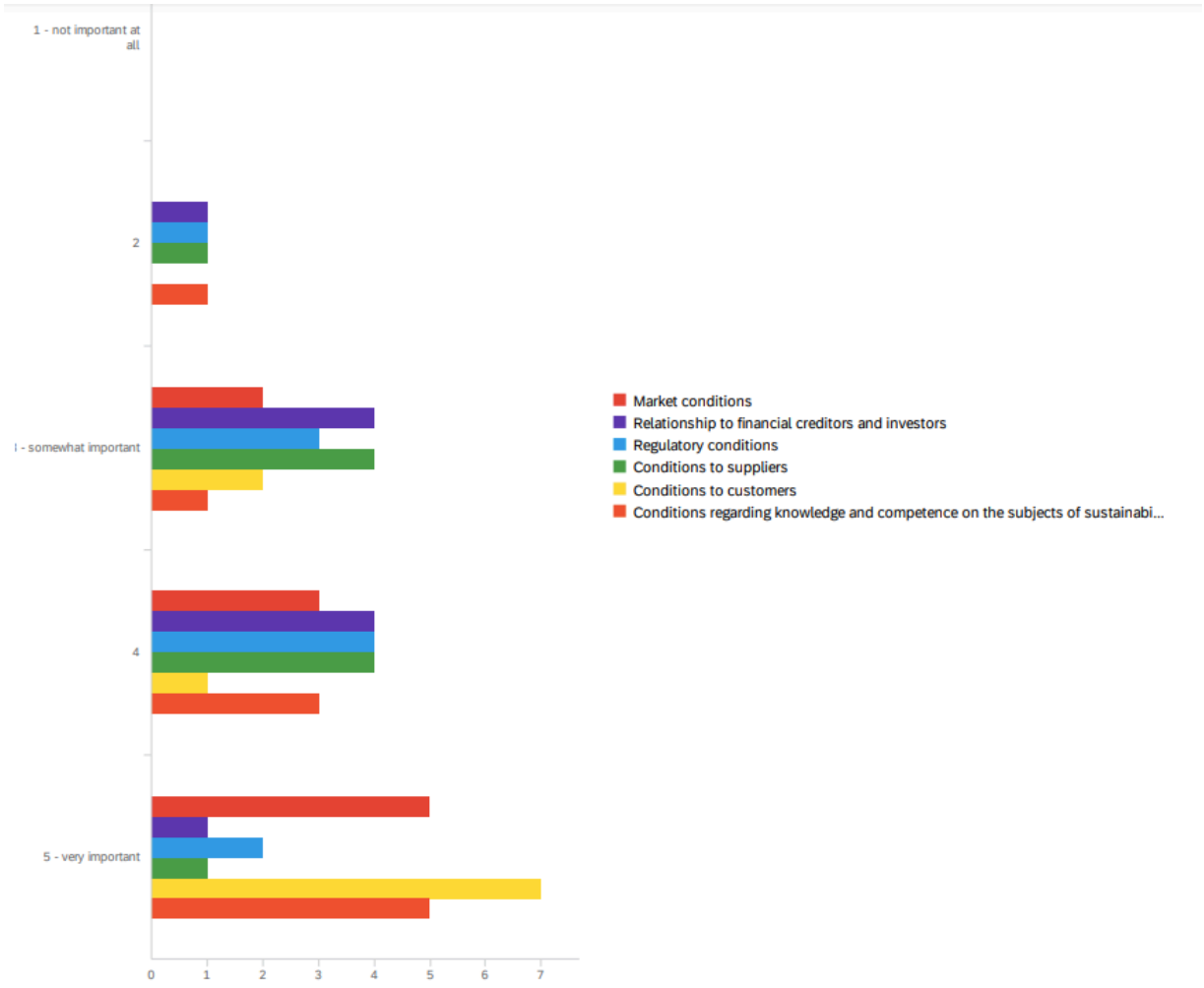
Moving on, the thesis also considers the weighting of the incentive factors. This section is directly related to research question 4.

4.4.1 External incentives

4.4.1.1 Incentive schemes related to customer considerations seem to be the most pressing incentives, while knowledge and competence surrounding sustainability and regulatory conditions are prioritized as second and third, respectively

With respect to external factors, it is evident that the majority of the respondents perceive that relationship to their customer base and more specifically customer demand is one of the most important factors. Despite these numbers having limited practical usability in terms of drawing sound statistical conclusions, they provide us with indications and, in a sense, point in a general direction of what the respondents emphasized. 7 out of 10 respondents thought that the relationship with customers was "very important". A common phrase from one of the respondents, that in some way summed up a lot of the viewpoints of the other respondents was: "The one thing that weighs the heaviest, is the fact that customers demand these products and services". This could derive from the fact that sustainability in certain situations is somewhat synonymous with quality and could lead to a higher degree of customer satisfaction. The respondents especially emphasized incentive structures such as 1) customer demand, 2) customer purchasing power, 3) customers' time- and budget constraints and 4) customers' willingness to pay for sustainable solutions.

Figure 7: *Illustration of questionnaire answers by respondents on external incentive structures*



Similarly, knowledge and competence surrounding sustainability, concepts and measures, seem to be a factor of significant importance, where 8 respondents either gave a score of 4 or 5. In a structural matter, a few of the respondents zero in on the fact that in large building projects, customers and their suppliers are working closely in every part of the process, and thus lays the groundwork for a co-ordinational stance of tackling questions and making choices surrounding sustainable solutions. Accordingly, inter-relational forces could be perceived as a crucial part of incentivizing, often in terms of the different parties' competence, attitude, and ambitions. The respondents emphasized especially incentive structures such as 1) the alignment of incentives between market participants, 2) coordination between market participants and 3) information flow; symmetry vs. asymmetry between the market participants.

Despite being given less weight than the two previous points, regulatory conditions are another important focal point and could serve as the root cause for a lot of incentives and disincentives for businesses. The respondents especially emphasized 1) the influence of national/international rules and legislation with respect to operational costs, predictability and pricing power, 2) terms of investments, 3) documentation- and certification demands, 4) regulators' role as system thinkers and 5) a subsequent influence by creating pressure in the value chain. In terms of rules and legislative measures, the main points are to a great extent related to how rules and legislative frameworks are interpreted, monetary incentives with respect to additional costs for businesses, and predictability in relation to standardization of documentation demands and certifications. While disposable debt and disposable equity constitute two main points for the subtopic of terms of investment. By having public institutions with a mandate to better the terms of investment, this has sped up the transition towards choosing sustainable solutions. To exemplify, subsidy schemes, with broader credit lines, and "better-than-alternative" interest rates, as well as the bettering of existing financial loan terms, could all be important factors to consider from businesses point of view. It could also give customers incentive, if the financial terms of suppliers lead to them lowering their operational costs, and thus could offer more competitive prices for their customers.

4.4.2 Internal factors

4.4.2.1 Increased competitiveness, influence of top management, organizational culture considerations and organizational reputation considerations seem to be the most pressing internal incentive schemes

With reference to internal factors, organizational and strategic considerations seem to be the most influential, with 5 out of 10 respondents indicating that they think it is "somewhat important" and 3 out of 10 respondents insinuating that they think it is "very important". Hereinafter, the respondents emphasize the stature of factors like increased competitiveness, influence of top management, organizational culture considerations and organizational reputation considerations. Increased competitiveness is complex, and it would be nearly impossible to try to decipher every aspect in relation to the phenomena, but the thesis has touched upon two main points: operational price mechanisms could attract customers and put businesses in a better position in tenders, as well as the point of strategic perception perspective from the market. The respondents also emphasize the effect of top management.

One point being that the top management have necessary influence on stating a common ground in the business surrounding sustainability in the organizational culture, and put in place system thinking, and shape the perception, attitude, and general stance on decision-makers in the business. They could also have influence on financial capability and delegation of financial assets to necessary projects and measures, by amongst others effectively introducing and implementing a "carrots-and-sticks" incentivizing scheme in the business. In a market perspective, top management could also leverage focus on sustainable solutions potentially towards suppliers, to further increase the adoption, and create a demand, to incentivize suppliers, and aligning the incentives between the market participants. There is also reason to believe that profitability is one of the factors that is deemed of significant importance. It is worth noting that in this thesis, profitability is an implicit acknowledgement of other factors, such as customer demand. Lastly, it could seem that EHS considerations are a totally necessary consideration. Most of the respondents insinuated that choosing sustainability solutions goes at the expense of health and safety, they would neglect the sustainable solutions in the cases where these are mutually contradictory. One respondent stated that: "it does not help if a business is a pioneer within sustainability and social engagement, if they have 4 deaths each year [...]", which is a fitting statement in this regard.

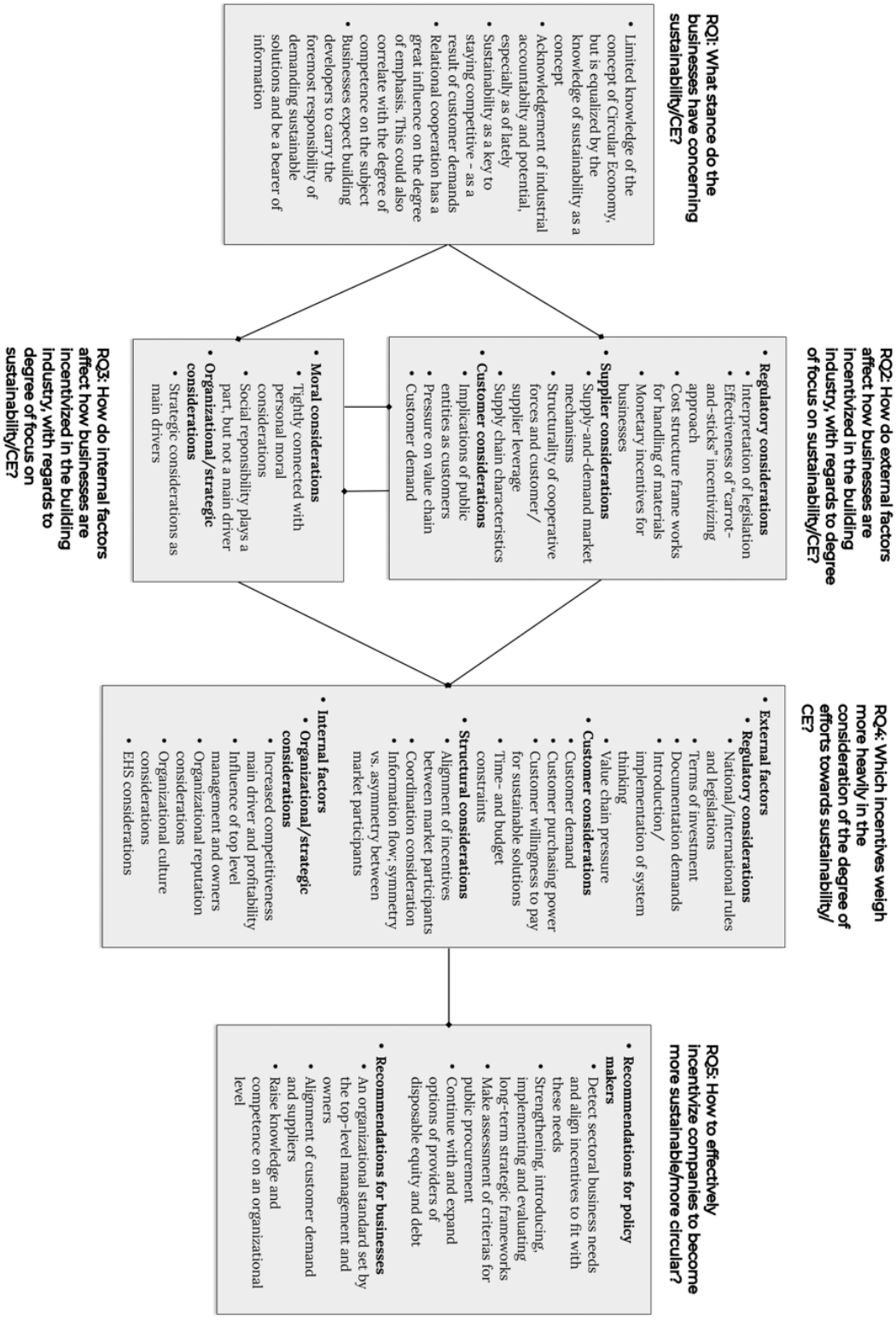
4.4.2.2 Summary of weighting of incentive factors

For the external incentive schemes customer considerations seems to be the most pressing incentive amongst the respondents. Meeting market demand is the most important, followed by knowledge and competence as second priority. Thirdly, the regulatory conditions are considered the least important of the internal factors, however it is still considered an important factor legal and mandatory nature. For the internal incentives, increased competitiveness, organizational culture considerations, influence of top management and organizational reputation considerations seems to be the most important internal incentive schemes. Due to the increasing demand on focus on sustainability a certain level of sustainability focus is mandatory in order to stay competitive. A strong stance from top management, which again creates and organizational culture which holds sustainability in high regard are also strong incentive schemes.

4.5 Thesis model

The idea behind the creation of the research questions model was to build a framework in which each research question builds up and leads to an informed answer to research question 5; How to effectively incentivize companies to become more sustainable/more circular? The layout of the interview and the additional questionnaire were created in a way that followed the research question model. After reviewing responses in the discussion and analysis part of this study we could fill in the answers to the research questions in the model. These findings are implemented in the model and can be viewed below. Implications of the model is discussed in the next section.

Figure 8: *Illustration of thesis model containing main finding and recommendations*



The interviews conducted in this study supported several aspects with the model we proposed previously. The external and internal incentive structures were very much related to the respondents' perception. This could perhaps have to do with the fact that these incentive structures, posed as drivers and barriers, directly had some explanatory power in explaining the respondents' perception. Admittedly with limited significance, this participated in confirming that the general structure of the model was applicable in a scientific research sense like the one of this study. Employee perception and attitudes, like sustainability as a key to staying competitive, also fulfilled a task of the model, by serving as a room for further discussion, even portraying the reciprocal connection between RQ1 and RQ3. Furthermore, the data from the respondents pointed to the connection between the three topics of incentive structures, sustainability and employee behavior, exemplified by for instance highlighting that public building developer purchasing power function as a strong incentive. Perhaps even more important in this manner is the fact that the data from the interviews supported theoretical connections between employee behavior and external and internal incentive structures, which is pivotal for the model. It contributes to conceptualize the connections and make the connections explicit. Moreover, several of the respondents emphasized how external incentive structures like customer demand could lead to internal turnaround for sustainable practices, conceptualizing the interrelation also between the different incentive structures. This could also function the other way around with self-enforcing drivers being put in place for each side. A prerequisite in the model is that different incentive structures are weighted differently, causing different effectiveness of incentivizing actions. This was emphasized by the respondents by some highlighting business reputation as one of the most pressing ones, while others stressed the attractiveness towards recruiting and sustaining qualified employees. This could also be linked to incentive theories previously introduced: the crowding out effect and performance evaluations (Gneezy, 2011; Medoff, 1980). The model could also function as a tool for assessing existing hypotheses. For example, we believed that the respondents were aware of and had knowledge on the topic of CE. By utilizing the model, we made this explicitly, and could assess when reviewing the findings during the results section.

The model does also have some implications for the thesis in terms of its relation to existing research and methodology. Firstly, the model is very simple in its form. This could have both positive and negative repercussions. On one side the model is easy to understand and interpret, including for non-researchers, and it serves as a basis point to understand the subtopics of this thesis. Furthermore, it could be versatile, as it could potentially be utilized for similar research

in this particular topic, but also in other industries and phenomena. On the other side, methodologically it could serve to be somewhat *too simplistic*, possibly omitting certain aspects. It could possibly lack direct connections between some of the research questions, like RQ1 and RQ4/RQ5.

In conjunction with this, the model could specifically lack a process focus. Similar existing research emphasize this (Matar et al, 2008). The model has some flaws in not accounting for project phases and stages for example, making it more difficult for business decision makers to interpret the main findings because it is hard to see what connections the findings have with its subsequent departments and divisions; the model lacks a system approach like the one of Hill et al (1997). To our knowledge, there is limited existing research methodology using a model like this one. The closest models are depicting process-related methods for system thinking and general definition of the topics at hand (Shi et al, 2012; Hill et al, 1997).

Furthermore, it is important to notice that the model accounts for the perceived reality of the stakeholders interviewed in this study. This is of significance (Onnis, 2019), because this study aims at capturing nuances, not quantitatively state whether the nuances are applicable to practice (Saunders et al, 2009). Conclusively, a benefit of such a model is the versatility outside our study. It could be used to validate statistically the findings in this study, for examples the ones of the most pressing external and internal incentive structures, such as customer demand, incentive alignment between market participants and value chain pressure. It could also serve as a basis point to other research fields to make up business and employee incentivizing and other phenomena, conceptualizing the topic at stake and making things explicit. By working with it, we argue that the model could enhance the chances of systematically think of the relations between business/employee behaviour, incentive structures and a potential third phenomenon, like Stahel (2006) argue in conjunction with his previous model.

The model is not properly designed to consider the dynamics in the action patterns between the stakeholders. For example, there are extensive information flows both alongside the external stakeholders and the business, but there could also be across and interchangeable crossings that the boxes and lines in the existing model is not aware of. This could also be applicable to other factors like complexity in value chains. Put simple, there are patterns that the model does not consider. Additionally, the model has not properly implemented the aspect of risk for the business participants and employees, as previously discussed by Gibbons

(1998). Lastly, models are a supposed to be a simplification of reality, and while the model has somewhat been validated by the data from the interviews, it remains to be seen whether the theoretical ground in this model accounts for the reality in the construction industry (Saunders et al, 2009).

5. Discussion

5.1 Theoretical implications

Sustainability is an increasingly popular topic and said to become critical for businesses to embrace sustainable business practices (Rafi, 2021). However, we believe existing research has some gaps in the area of how to address the increasing focus in sustainability for specific industries and how to create opportunities where actors in the said industry chooses sustainable options and business models. With a standpoint from incentive theory, we wanted to explore an avenue in which the growing focus on sustainability in a specific industry could be explored and understood and lay the groundwork for how to act upon acquired knowledge and data.

5.1.1 This qualitative-like study could supplement international research, strongly influenced by quantitative-like research, on the topic of incentivizing business with respect to sustainability

Although there exist several international studies combining the research areas of incentive theory and sustainability theory (Merriman et al, 2015; Durdyev et al, 2018; Olubunmi et al, 2016; Gan et al, 2015), this study could fill the gap in a Norwegian research context. As well, it could work as a supplement to international research, since this is heavily influenced by quantitative-like research. This could be further evident considering that Norway has got different regulatory frameworks and policy making than the ones of Cambodia, UK and the US, which are some examples of comparable research like this has been conducted. In addition to potentially other infrastructural compositions, making the general findings in these studies potentially non-applicable for Norwegian conditions. Additionally, most of the existing research is quantitative in nature, with different aims than this study (AlSanad, 2015; Huber et al, 2015). With this study being qualitative-like, trying to capture amongst others general opinions, nuances and attitudes, this study could serve as a starting point for other quantitative-like studies, to quantify these opinions, nuances and attitudes, and potentially postulating sound significant conclusions (Saunders et al, 2009).

5.1.2 One of the study's main contributions is perhaps its holistic view through the build-up in the research questions, and the depiction of the model

The model presented in this thesis could work as a point to derive from and have a general setup that potentially could be used in most industries. By following the research questions step by step this creates a process in which a user of the model maps and categorizes the different stances in the industry towards sustainability, the internal and external factors that affect their choices and how they weigh these factors. With acquiring this knowledge, we believe the model creates an opportunity in which a decision of how to best incentivize businesses to make sustainable practices and decisions. We believe it to be essential to fully acknowledge the different factors that play a part in the degree of sustainability of a company. The main potential usage of this model for scientific research is perhaps its general rule of thought and its structural build-up. This could potentially serve as a supplement to existing research, as a considerable amount of it does not follow such a contextual build-up. The model could function as a sketch for future research scrutinizing other industries. In this way, it could help conceptualize the connection between incentive theory and theory on sustainability. For example, Durdyev et al (2018) and Ahn et al (2013) do emphasize creating a scientific basis in their studies by mapping business' perception and awareness concerning the topic of sustainability, and hereinafter use this common ground to help explain which incentives are ruling, in order to assess which incentive structures that should be addressed by adjacent stakeholders. Although we deem the main findings themselves to be valuable in this study, we conceptually make a distinction between the findings and the model, as we think these must be evaluated individually. While we think that the findings could be evaluated with comparable existing studies and their findings in other countries, we don't necessarily think this is the direct case for the model itself, because a lot of the existing research doesn't have a setup like the one depicted in the model.

5.1.3 The study's categorizations could have some theoretical implications for international research in the topic, such as creating a common ground for comparing relevant research

Furthermore, the study's categorizations could have some implications. Firstly, we have chosen to make categorizations that concern research question 2, 3, 4 and 5, by dividing into

external and internal incentive structures, and thereafter into barriers and drivers. Categorizations could somewhat be viewed as arbitrary; the purpose of the study should set the general direction of the categorizations, as is the thought with this particular study. Thus, the thesis' categorizations could have some implications for existing research, and vice versa. For example, researchers like Gurzawska et al (2017) and Olubunmi et al (2016) have made explicit choices by categorizing onto external and internal incentive structures, like this study, to an extent illustrating the thesis' coherence with existing research. Other existing research, like the one made by Gan et al (2015) implicitly states a distinction between external and internal incentives by having categories like "policy and regulations" and "competition" on one side, and "intangible benefits" and "project organization structure" on the other. In essence, all the existing research containing the combination of incentive theory and sustainability in the construction industry, do have parts on external and/or internal incentive factors. The difference lies in the fact that researchers could explicitly state that "these incentive schemes are viewed as external", or not. Altogether, we believe that this is a game about explicitly stating what categorizations are made, and why. We believe that research, where it is due, that explicitly differs between external and internal incentives have an advantage, because it creates a common ground to assess potential recommendations from all relevant research on this topic, as well as it could give necessary structure. Moreover, these external and internal incentive structures are divided into barriers and drivers. Studies done by amongst others Serpell et al (2013), Ahn et al (2013) and Durdyev et al (2018) have all explicitly stated the need for categorizing into drivers and barriers. Because the context of this thesis concerns human behavior in an organizational context, one should account for what incentives and motivational structures draw in the direction of incentivizing and disincentivizing. This study therefore stands in line with existing research, utilizing relevant organizational incentive theory to get a grasp of for-profit business behavior.

5.1.4 The study's main findings actualize the need to combine the research areas of organizational incentive theory to try to explain organizational and employee behavior, as well as the benefits of addressing several stakeholders in the same context

In terms of the specific findings made from this study, this study emphasizes a further need to combine the subject of motivational theory to understand behavior by some explanatory power, and underlines the importance of addressing several stakeholders, as well as the

relational incentive structures between them. For instance, the influence of regulators are stressed by Durdyev et al (2018), Olubunmi et al (2017) and Gan et al (2015), while Gurzawska et al (2017), Merriman et al (2015) and Hallstedt et al (2010) emphasize the importance of internal governance, the top management's role and an internal business structure for sustainability-related information and decision processes; all pointing to the need of addressing businesses directly as well as their surroundings, such as regulators, but also other stakeholders like suppliers and NGOs.

5.2 Practical implications

5.2.1 Recommendations and implications for main findings

This accounts for the main findings and interpretations in relation to research question 5, surrounding how one effectively could incentivize businesses to increase sustainability efforts.

5.2.1.1 Recommendations and implications for regulatory bodies

First and foremost, it is evident that, due to the structurality of the industry, regulatory forces and policy makers influence the aggregate leeway of the operability of businesses in the industry. It is thus integral to acknowledge the incentives that make up the combination of these bodies, because they largely will affect one another. They function in an interplay, and to facilitate the practical feasibility of sustainable solutions, regulatory bodies hold a role that can enable this transition, due to its position in the power relationship. Consequently, we have identified four main focus points that could function as a baseline for further work.

5.2.1.2 Detect sectoral business needs and align incentives to fit with these needs

Although it could seem somewhat self-explanatory, detecting business needs and creating legislation that fits these needs could be a highly effective measure. Visibly, at least some business groupings illustrate that this is not necessarily the case for particular legislation and regulations: reusability of building materials, documentation demands and interpretability of international regulations being some of the main "pain points" deriving from the respondents. Regulatory bodies should continue to emphasize how they communicate regulations and legislation, especially in terms of those that make up these barriers, to the affected businesses. As well, they could benefit by identifying and including the viewpoints of all businesses in the

relevant subsectors in the policy making processes, as some of the respondents call attention to the fact that some subsectors feel they have had less influence on certain regulations, and this have in some cases lead to disincentivizing for these businesses with respect to choosing sustainable solutions. This is supported by studies made by Olubunmi et al (2016) and Gan et al (2015). In these individual regulatory and legislative processes, the respondents emphasize that policy makers should determine whether businesses think if the regulations and legislation is too tight or too loose, as it could seem like there is not necessarily cohesion in all areas considering the overall terms as it is now. In relation to this, one specific measure could be the one addressing the costs of documentation demands: review, weigh alternative measures and put the most appropriate ones into action. Specifically, additional costs related to cleaning, testing and documenting building materials should be addressed. International studies, like the one of Qian et al (2016) also point on the effects and increased operational costs, highlighting the need to address this even further. In this regard, Häkkinen et al (2011) refer to challenges of current legislation concerning underemphasizing the existing building stock, which could also be of regulatory importance, when designing regulations.

To help with these processes, regulatory bodies could reap benefits from facilitating arenas of information exchanges. Seminars and conferences have traditionally been of good use according to some of the respondents, and could be a point of departure, also in line with existing research from Hallstedt et al (2010) and Pothbare et al (2009). There are also apparent advantages by utilizing such a principle in an evaluation manner after regulations and legislation is put in place. These measures could help mitigate problems with "limited interaction with businesses", steer the room of maneuverability and make possible systematic thinking and forming of a general attitude, supported by Olubunmi et al (2016).

5.2.1.3 Strengthening, introducing, implementing and evaluating long-term strategic frameworks

In conjunction with this, businesses point out the importance of predictability for businesses, and emphasize the use and significance of long-term strategic frameworks. Möslein et al (2017) regard this of utmost importance - calling for a coherent and long-termism regulatory strategy, scrutinizing the conditions in the EU. One such example, that is defined and communicated in Norway, is "Eiendomssektorens veikart mot 2050" ("The real estate sector's

roadmap") which constitutes recommendations ("immediate actions") for relevant stakeholders, like regulatory bodies, building developers and building developers. By introducing more of these long-term strategic frameworks this could help strengthen to align market participants. For example, the respondents have touched upon the significance of evaluating concrete measures in relation to the "National strategy for circular economy" or introducing a long-term strategy for "digital twins", because market conditions will most likely change in the coming years. In addition, regulatory bodies could benefit from evaluating to what degree the different frameworks interact with each other, even allocating resources to task forces with this sole purpose. In this case, as well, one could create a structure for evaluating the measures, focusing on measuring the effects and facilitating arenas for new measures to adapt and iterate the frameworks.

5.2.1.4 Make assessment of criteria for public procurement

Another significant "pain point" that a lot of the respondents brought up was related to public procurement, and the potential for improvements. Existing research from Durdyev et al (2018) emphasizes the need, studying primarily Cambodian conditions, as lack of statutory requirements that cover sustainable procurement is identified as one of the five most pressing barriers for sustainable construction practices. Furthermore, Rwelamila et al (2000) point to indications that traditional procurement models are one of the main challenges for the incapacity for project management to deal with sustainable parameters, in South African countries. Although the regulatory frameworks in these countries are not necessarily directly comparable with the ones in Norway, we think the studies bring sound conceptual arguments and some train of thoughts applicable also to Norwegian conditions.

Because public entities often act as the building developers, making the orders of entrepreneurs and contractors, a large portion of the total projects is done by public entities. One of the challenges that arose from the respondents is associated with sub-criteria for sustainability and environmentalism, and could be mitigated by differentiating the sub-criteria, so the procurement offers from suppliers are able to be evaluated and measured separately, in order for the public building developers to make distinction between them. Secondly, one could assess in each project whether it is viable to increase the weight of the sustainability and environmental criteria, and in the cases where these criteria are non-existent, assess whether

they could be implemented and eventually implement them. Thirdly, policy makers could introduce sanctions if suppliers do not uphold their promises of sustainable measures, as stated in their offers. This could create a signaling effect, and potentially increase the likelihood of creating mental accountability in a preventive manner. This is in line with research made by Sourani et al (2015).

In addition to the main challenges the respondents identified in the interviews, Ruparathna et al (2015) point to unavailability of standard methods for procurement could serve as a barrier that should be met by regulatory bodies. Even though there are existing structures surrounding sustainability in procurement processes we propose a holistic review of the structure of these processes. Creating a framework following a process where 1) introduction of application of Environmental Assessment (EA) during the planning and design stage clearly defining what sustainable construction means, and 2) implementation of an Environmental Management System (EMS) for each project, during construction, operation and where appropriate, even decommissioning (Rwelamila et al, 2000), could serve as a suitable foundation to derive from.

5.2.1.5 Continue with (and potentially expand) options of providers of disposable equity and debt

Moreover, the respondents have emphasized the importance of disposable equity and debt provided by public entities. To partially cope with the challenge where sustainable solutions are more expensive than the alternatives, and to increase the monetary incentives for business, these measures could be crucial. These findings are in line with Gan et al (2015). They point out that regulators could help by having a greater focus on fiscal incentive measurements, amongst others improving subsidies funding and streamlining the entire process of funding allocation. Durdyev et al (2018) takes it even a step further, arguing that financial incentives are crucial for businesses to adopt sustainable practices in their projects.

Policy makers could specifically evaluate subsidy schemes, like the ones provided by ENOVA and Innovation Norway; what types of projects get the most applications, and why? Are the framework conditions suitable for each subsidy scheme? By doing this, they could assess the need for additional funding for the existing providers, or even further, assess the need for additional providers. Although, Qian et al (2016) question the effectiveness of such subsidy policies, pointing to the fact that the comparable situation of that in China lead to subsidy

funding being provided some time after completion of projects, causing cash flow issues for owners, and potentially disincentivizing internal stakeholders. Thus, regulatory bodies need to make sure to design subsidy schemes to address issues of this matter. Furthermore, policy makers could evaluate the need for disposable debt. For instance, evaluating what are the effects of providing better financing for existing debt, and are the debt conditions suitable for the business' needs? As a continuation of the challenges connected with the additional costs of documentation demands, policy makers could for instance review opportunities within subsidizing or issue debt to address costs related to cleaning, testing and documenting, as businesses have little financial incentive to reuse building materials, or allocate resources towards acquiring reused materials from other suppliers. In this way, these could be two general measures to help tackle this issue.

5.2.2 Recommendations and implications for businesses

This section will use the findings of the analysis to point out their implications for businesses in the industry. Subsequently, we identify three recommendations based on the analysis which can incentivize businesses to increase the degree of sustainability within the business.

5.2.2.1 An organizational standard set by the top-level management and owners

A clear stance by the owners and the top-level management in a business will at a minimum set up the grounds for sustainable guidelines in which employees will follow to be in line with company policy. This is coherent with existing research made by amongst others Merriman et al (2015) and Hallstedt et al (2010). Whether or not this top-level attitude is based on organizational and strategic incentives, or by moral incentives, it will drip down in the organization's employees, signaling a clear voice in the context of sustainability. Subsequently, this top-level stance paves the way and enable the rise of a business culture more catered towards sustainability and sustainable solutions within the business. To exemplify, the top-management could need to address status quo stance internally (Merriman et al, 2015). A culture in which sustainability plays an important factor can be a massive factor in the importance of sustainability in organizational practices. Furthermore, Merriman et al (2015) address additional perspectives on employee incentivizing by raising questions

surrounding the potential benefits of top-level management introducing employee rewards for sustainability-related measures. This point is also provided by Hallstedt et al (2010). While this thesis does not provide such a perspective, it could have some implications in real life. Shelbourn et al (2015) challenge to some degree *how* top management should function as the main driver in this work, suggesting that knowledge is an object that can be embedded and distributed rather as a change in the perceptions of individual actors. Structurally, although general emphasis from top-level management could seem necessary, recent research suggests a psychological backlash among employees against corporate environmental messages (Westervelt, 2014). This could require top-level and management and owners to define and communicate a clear strategy for corporate sustainability in general to employees, to effectively create real incentives for employees.

Often seen in these companies are their own departments focused on sustainable work, being involved and assisting other departments during the initial design and implementation processes. As brought up during the analysis of this study an organizational culture which holds sustainability in high regard can have important indirect effects, such as attracting new employees. This is also supported by Gan et al (2015), emphasizing the structural weight of education and training as an incentive. Being able to have a business culture in which places the business as an attractive employee, thus attracting new talent can be an invaluable asset for the organization. With an ever-growing increase in sustainability, recruiting and securing talent could build a strong foundation in staying competitive, capable and ahead of the curve. This is also in line with the findings from Durdyev et al (2018), which claim that retention of skilled labor is one of the most sought-after incentives for businesses in this regard, and Qian et al (2016) that sustainability emphasis creates job opportunities.

5.2.2.2 Alignment of customer demand and suppliers

With the increase of sustainability as a factor by customers, it falls on the business to ensure it has a supplier on the same page, with the ability to provide supplies that complies with the demands set by customers. Even though the sustainability focus eventually will be expected to drip down to supplier and mirror the customer demands, where supply equals demand, this effect might take time, and vary depending on the supplier's situations and location. For example, Presley et al (2010) argue that maintaining long term relationships carry substantial

weight to create and retain stakeholder participation, which supports this. Durdyev et al (2018) challenge this view, as the study's respondents rated partnership working as an incentive structure given far less weight than other incentive structures. Being able to comply with customer demand on a supplier level is necessary, and the business should consider whether its current suppliers share and match the business degree of focus on sustainability, or if a change in suppliers is a better option. Gan et al (2015), on the other side, argue that for instance cooperation between project stakeholders have less explanatory power in terms of incentivizing businesses. At the same time, their study shows that incentive structures like market demand, information/knowledge and industrial culture, were weighted relatively high, showcasing some of the complexity in relational cooperation, and structurally induced challenges. The study of Durdyev et al (2018) also states that sustainable construction functions as an economic driver by creating value for money in project deliveries, potentially signaling a willingness to pay for sustainable solutions. In sum, we think it is reasonable to believe that an alignment of customer demand and supplier demand, combined with a same-level of knowledge and competence, could induce effective incentives for businesses.

5.2.2.3 Raise knowledge and competence on an organizational level

Our analysis finds indications that the degree of sustainability focus is linked with the degree of knowledge and competence on the subject. We believe raising this bar on an organizational level will help incentivize the degree of sustainability in the business. The study of Durdyev et al (2018) makes the argument that this is not necessarily the case, where knowledge management is deemed to be of less importance, which makes a compelling discussion. We argue that it is beneficiary but acknowledge just in the correct context. For example, Pitt et al (2009) criticize the construction industry to be reactive thus only completing things that need/must be done, while we argue that this is more nuanced. At minimum, the data from the interviews showcase that at least fragments of the industry are at the forefront of proactive changes by for instance leveraging their customer purchasing power, contribute to structural knowledge sharing and sustaining through project collaborations and individual efforts.

As well as building an organizational culture involving sustainability, a knowledge boost will create a common understanding and competence in each part of the business, creating a culture in which departments collaborate and communicate based on their expertise, unlike a common

situation where sustainability and environment departments push their ideas and recommendations on other departments. Hallstedt et al (2010) argue that for businesses at all organizational levels, one should have a standardized "toolbox" for sustainability-related information, that is to be used in business decision processes. We believe that this could serve as a suitable place to derive from, if one as a business would like to increase and retain the knowledge and competence on sustainability. An organizational boost in knowledge will also very likely increase competitiveness in the market, enabling undertaking projects with a higher degree of sustainability than before. Also, worth mentioning, is the fact that by internally creating a culture in which sustainability is an important factor signals outward towards customers how sustainability is considered important internally, and the business lives by what they preach to customers, and complies with their ideas, signaling outwards as a sustainable and environmentally aware business. In this regard, Olubunmi et al (2016) emphasize that internal stakeholders like owners are discouraged by accompanying costs of meeting the conditions for benefiting from incentives. A high degree of sustainable focus internally could then have the potential to save costs, which again is being made easier to implement with a common organizational knowledge base.

5.3 Limitations

5.3.1 General limitations concerning the contents of the thesis

A central delimitation in this thesis is that it is not necessarily interested in the "actual" state, as it is perceived per today, but rather the underlying incentive mechanisms and the motives from a business perspective. Hence, the thesis does not consider how the respondents think and say but try to strain them into reflecting on their principal procedures, thought processes and systems of belief.

Moreover, the concept of sustainability is interpreted narrowly in the thesis: it is viewed in a climate and gas emission context, and thus neglecting sustainability in other contexts, such as social sustainability (i.e., racial and gender equality, poverty etc.), economic growth or in a structural matter, to mention some examples.

Furthermore, this study does not constitute exhaustive lists of subjects surrounding the research questions but serve rather to highlight some of the exchanges of views of market participants and their adjacent nuances that could emerge in the industry. Because of this, there

could be several key aspects not accounted for in this thesis, in which some could represent ideas and perspectives surrounding future research. In addition, the categorizations we have made that we methodically have used a roadmap, have some limitations. For instance, some of the categorizations could be perceived as not mutually exclusive, creating some incoherent interpretations, as some findings and conclusions slide into each other, and not fully accounting for an explicit review of these findings and conclusions.

Furthermore, this study is limited to portray findings from a business perspective, and to some degree neglecting the perspective from other stakeholders, such as regulators, business owners and NGOs. The thesis accounts for perspectives from a middle-management point of view and thus does not provide findings and observations from the perspective of top management and associates in the aforementioned businesses.

5.3.2 Methodological implications

As researchers and interviewers, we need to acknowledge the effect cognitive biases have on the study's reliability and validity. Here we will review these biases´ implications and potential mitigations, generalizability and theoretical saturation.

5.3.2.1 We as interviewers need to assess the potential implications of interviewer- and observer bias on the study's findings. We have tried to mitigate the potential effects by carefully iterating the categorizations, cross-checking the findings with each individual interview and design alternate hypotheses

We need to develop a general grasp of potential effects of interviewer bias, because the respondents may respond to the questions in another manner, rather than ideally (as unbiased as possible) and firstly intended, which again can lead to a false base of data, and the ultimate consequence could be that this data draws false findings and conclusions. This accounts for biases related to how we as interviewers and how the respondent conducts the interview, in terms of interview questions, comments, tone of other non-verbal behavior. We as interviewers may, as a result of our own beliefs, biases and prejudices, influence the way the respondents answer the questions. As well, is it possible that we might demonstrate bias in the way we interpret the responses (Easterby-Smith et al. 2008). This could all be participating factors in reducing the study's reliability. For example, we need to account for instances such as the one where respondents emphasize incentive drivers, that they could in fact carry less weight and have less effect on the total incentivizing process for business in practice. By carefully iterating

on the thesis' categorizations, cross-checking the findings in one interview with the other interviews, we have tried to mitigate the extent of these effects.

Observer bias is based on when an individual's interpretation of another person is influenced by their own cognitive biases, and in this case refers to when observers (respondents) give inaccurate responses to skew the results of the interview. For example, we as interviewers, could lead the respondents to speak in topical subtopics, for instance the topic of reusability of building materials, which in itself could lead to somewhat "skewed" results, as it potentially could leave out relevant nuances on other subtopics. In addition, we could have asked questions in such a manner (tone of question, face expression, mimics etc.) that the respondents answered their questions skewed. We believe the effects of the latter are limited; however, the effects of the former are somewhat more applicable. Nonetheless, by speaking about the most pressing subtopics and themes under the main topic of "sustainability", we deem the potential effects to be of satisfactory extent. We have also tried to mitigate these potential data quality issues by having alternative and competing hypotheses, while also "playing devil's advocate" when discussing the findings from the interviews.

5.3.2.2 The interviews could bear effects of response biases, such as the withholding of information or answers that should fit a desirable business image. We have attempted to mitigate the effects by explicitly stating the study's purpose, playing "devil's advocate" and undergoing several data analysis processes

Associated with the previous point is response bias, which is biases that may be caused by perceptions about the interviewer, as referred to above, or in relation to perceived interviewer bias (Saunders et al, 2009). Participating in interviews could be perceived as an interfering process, especially in the case of semi-structured interviews, because the goal is to develop a broad understanding and nuances in particular topics of discussion, and to seek explanations that sometimes could be unpleasant for a respondent. Our respondents were also part of middle-management in medium-sized and large companies, in a position where they are reporting to their superiors, and do not necessarily want to disclose every aspect, both in terms of accountability, but also strategic considerations. In relation to this, the respondents may provide a partial "picture" of the situation that perceives the one concerned in a "socially

desirable" role. Because of this, respondents may choose not to reveal the full story related to the question at hand.

During the interview process we did not explicitly experience that the respondents withheld any information, however, this is not necessarily expected either, as this is a part of the bias challenge. The most influential aspects that the respondents possibly could assess, in our opinion, are nonetheless:

- They felt like the interview was an assessment of the company's focus on sustainability and CE, and skewed some or all of the answers, in order to "fit" a desirable role and/or felt guilt for not focusing enough on it.

We have tried to mitigate this by explicitly stating that the intention with the interview is not an assessment of today's practices, but rather to unveil what lay behind and the reasoning behind today's practices; the motivational and incentivizing factors connected with the actual behavior. We did this in the introductory phase of each interview.

- As an extension of the previous point: the need to fit in an "organizational narrative". Whether it is to fit with the strategic overall goals for the company or simply to comply with his/her boss' desires as a company representative, this could lead to a methodological fallacy.

We have tried to lessen the extent of potential bias by providing a nuanced view of the respondents' answers in the discussion part, as well as trying to play "devil's advocate" in the main findings section of the thesis. In addition, we have been through processes undergoing the data several times: first by conducting the interview, secondly by writing notes during the interview, thirdly by listening to videotape of the interview and lastly by transcribing the interview. We believe that this makes a better base for a thorough understanding and interpretation when studying the findings.

5.3.2.3 Selection biases, such as anchoring effect and availability/recency bias, could potentially lead to false conclusions. We have attempted to mitigate the effects by triangulating with other sources of data and asking follow-up questions

Selection biases are biases caused by a flaw in the sample selection process; some information is unconsciously chosen or overlooked, causing wrong or false conclusions. In this study we will regard selection biases as a collective name for some more specific biases, such as anchoring effect and availability bias. This is not to provide an exhaustive list of biases, but rather the most influential ones for our study, in our opinion.

Anchoring effect bias refers to the respondents relying too heavily on certain pieces of information when answering questions, and oftentimes the first piece of information that is presented by the researchers. For example, when answering questions, the respondents could rely on pre-existing information on the topic of sustainability and CE, in the light of their own experiences with the topics, omitting potentially important aspects. The respondents' perception of CE and its conceptual value could be influenced by their initial preconception of it. We have tried to mitigate this potential data quality issue by assessing the reliability of the source itself, i.e., the respondents, and triangulating with other sources of data, such as existing theory and own notes during the interviews. We could also view this as a natural positive effect, as it is fair to assume that the first piece of information could be the most pressing one, potentially increasing the findings' validity.

Availability bias refers to the fact that weighting recent events disproportionately higher than previous events. Oftentimes, respondents will only provide recent and available information and input on questions; information they can quickly recall. When applying this potential mental shortcut, we consider the information the respondents can most easily recall as valid and ignore alternative solutions or opinions. For example, when presented with the research questions, the respondents did not have any prerequisites if asked a question and they have only talked about particular nuances with their colleagues, and thus are not aware of anything else. Potential implications of this bias are somewhat hard to mitigate as we can't directly influence what the respondents answer in each question. However, one potential mitigation has been performed by asking the respondents follow-up questions, trying to scrutinize the full extent of familiarity the respondent has to each topic.

5.3.2.4 The limited industry specific knowledge of interviewers could potentially pose a challenge for the study's validity. We have attempted to mitigate the extent of these

potential effects by having interpretable research questions as well as designing suitable categorizations

Another factor that could affect the responses is the level of knowledge of the interviewers. Although the interview was mostly targeted at questions related to the thesis, we could not help that some interviews and respondents in particular commented on some technical aspects with their line of profession. Potentially relevant aspects that we took notice of concerned specific regulatory frameworks (like TEK), technical solutions (like BREEAM certification and BIM (building information modelling)) and concrete construction projects. The interviewers had little or no knowledge about these aspects. Nevertheless, we deem that this is not crucial for the overall validity of the thesis, as we feel we have the necessary knowledge related to the research questions; we are searching for information on a more conceptual level, rather than in a detailed level. In addition, with our theoretical framework and categorizations connected with the interview, we have tried to mitigate this to a reasonable extent.

Overall, we have tried to overcome these biases by a holistic sampling strategy, developing an interview template, having a consistent overall interview structure for all interviews with an interview guide and cross-checking the respondents' answers with a questionnaire. Nonetheless, we acknowledge that, partly due to the nature of qualitative studies, the study has some concerns in relation to its reliability and validity.

5.3.2.5 Generalizability

There is also likely to be an issue about the generalizability of the findings from qualitatively based interview studies, although the validity of such studies is not raised as an issue (Saunders et al. 2009). If we review the validity aspect first, this refers to the extent the respondent gets a hold of their respondents' understanding and experience, and to which degree they are able to gather a meaning that the respondent intended with their own language. We think that we are able to achieve a satisfactory level of validity when conducting semi-structured (qualitative) interviews by making and evaluating an interview guide, carefully clarifying the questions at hand for the respondents, probing the meaning of the responses and discussing them from a variety of angles. Yet, such studies do not provide us with statistical generalizations about an entire population since the sample is comparatively small and hence unrepresentative (Saunders et al. 2009). This is also often the case when using a grounded theory study strategy. For example, if we assume that there are around 260.000 employees (BNL, 2021) in the building- and construction industry, we are not able to make sound

statistical conclusions based on interviews with 10 respondents. Additionally, just to emphasize the last point, the sampling strategy used does not necessarily lead to a satisfactory representative basis for statistical significance, due to gender issues (interviewed more females, even though there are far more males in the industry), geographical issues, (our sample predominantly are from larger cities like Bergen and Oslo, thus generally underrepresenting companies in more rural part of Norway and company size (sampled predominantly from medium- and large sized companies, even though there are far more small sized companies). Although the point on generalizability could seem self-explanatory when presented with such examples, this is fundamental when interpreting the findings and the subsequent discussion from the study.

5.3.2.6 Theoretical saturation

Data sampling should ideally go on until the researcher reaches "theoretical saturation", which rely on the notion that the concepts (its relations and the phenomena in which the research is supposed to highlight) needs to be developed, redefined and adjusted until no new concepts, properties or interesting links arise (Strauss & Corbin, 1997). This is principally a strength with the grounded theory methodology; such "theoretical sampling" optimizes the chances of gathering a holistic view of the research topics at hand. Because of time constraints, we had to limit the number of interviews, and thus the total amount of data gathered. Consequently, we do not know the full extent and implication of the study's theoretical saturation. Further on, this could potentially put the study's reliability and validity at risk.

5.4 Ideas surrounding future research

With the analytic method of acquiring information being based on conducting interviews with ten middle level managers in the construction industry, this research will not find statistically significant results for the industry as a whole. It did, however, find some interesting points that we consider having strong potential of being important considerations in potential future research. Following we will list some of the interesting information we acquired and view as interesting finds in the construction industry, potentially paving the path for future research and experiments to better understand the characteristics of the construction industry.

5.4.1 Further test hypotheses gained after reviewing the main findings from this study: potential effects of young employees vs. old, employees in cities vs. rural areas

From our interviews with middle level managers there seems to be a shared opinion by most that the younger part of the workforce has a higher degree of focus on sustainability. This is also in line with their perception of younger generations possessing a higher knowledge on the subject and its practical elements, such as specifically circular economy and how it differs from sustainability on a conceptual level. Multiple respondents place this gap of focus and knowledge at the 40-year mark. We think this could be an interesting and important subject for future research in order to understand why and how companies differ in their focus on sustainable work. We would be interested in seeing if an age gap provides a statistically significant difference in focus on sustainability and its importance. Furthermore, it would be interesting to see if there is a specific age gap (i.e., 40-45) where the differences in focus on sustainability becomes true. These indications somehow contradict previous research done by Roasi et al. (2018), that found no significant difference in younger and older employees, while looking at Italian bank employees. Additionally, the meta-analysis by Wiernik et al. (2013) concluded in the opposite of our thesis, in which older individuals were more inclined to engage in Nature, avoid environmental harm and conserve raw materials and natural resources (Wiernik, 2013). Interesting future research could confirm or deny the indications shown in this thesis construction industry and in Norway.

Additionally, it would be interesting to research why this difference in focus exists. Could this be a result of more recent focus on sustainability from an educational level, providing knowledge on the subject and its importance? If so, is knowledge the main reason for the difference in focus on sustainable work? If that is the case, research on this topic could provide an interesting solution of how to increase focus on sustainability, by providing sustainability courses and seminars to raise knowledge on the importance of sustainability in the construction industry.

Two out of our ten respondents worked in more rural areas away from the big cities in Norway. These two respondents also had next to zero knowledge of circular economy, and a lesser weight on sustainability in projects than their counterparts in the cities. One of the respondents, a regional manager in Oslo, also credited the big public customers to be a part of the sustainability focus in the city and thought that this focus drippled to its surrounding areas, like Lillestrøm.

The higher sustainability focus in big cities is also on line with higher competition and how a clear sustainability stance plays a part as an important factor in staying competitive. An interesting idea for future research could be to see if companies in the bigger cities like Oslo and Trondheim are indeed statistically ahead in sustainability in comparison to their more rural counterparts. Additionally, we think it would be interesting to see if this difference can be explained by public companies and their focus or the lower competition to acquire jobs.

5.4.2 Supplement with data from other stakeholders

It would also be interesting to examine the views of other stakeholders, in the likes of business owners, top management and associates internally, and regulatory bodies and NGOs externally. This thesis also does not cover the part of the relationship between departments internally, or the relationship between internal departments and top- and middle management. Alternatively, one could examine the relationship between personal views and perceived views as a business employee. The study of Jang et al. (2017) confirmed a significant role of the values and leadership of top management in advancing environmental commitment (Jang, 2017) in the restaurant business. We think a similar experiment in top level management in the construction industry in Norway can yield both interesting and useful results to this thesis.

Externally, it would have been interesting to study the viewpoints of different regulatory bodies, NGOs or other groups. One could further examine the relationship between these viewpoints and compare it to those of the internal groupings and gain a more holistic understanding of the different incentive mechanisms. With this in mind, it would also be interesting to attempt to assess some of the hypotheses that implicitly have been formed throughout working with this study. For example, check whether big public entities that often figurate as building developers are more inclined to have more focus on sustainability than their private counterparts, and if they have more willingness to pay for sustainable solutions. With two of the respondents crediting big public companies like Statsbygg to make an example of high sustainable focus, and interesting research would be to look at how private and public sector differs and how the public sector affects the private companies in work towards sustainability.

5.4.3 "Sustainability isn't really used as a measure in "tenders", becoming irrelevant"

Four out of the ten respondents expressed an opinion on the fact that sustainability in practice was not as important as in theory while competing for projects, even for customers with a high sustainability focus. This problem was brought up by two of the respondents during our interview. These two respondents explained the problem emerging because the customer didn't have the necessary knowledge and competence to specifically understand, measure and follow-up the degree of sustainable solutions that was offered during tenders for projects. Lacking this knowledge to differentiate the contributions towards sustainability, the customer would categorize the propositions as "good enough" or "not good enough", and not really differentiate them, in essence making sustainability obsolete, with price being the real competition for businesses categorized as "good enough". It would have been interesting to attempt to confirm or refute the hypothesis that revolves around tenders and procurement processes

Additionally, as mentioned, these two respondents also pointed at the lack of follow-up functions as a tool to ensure that the proposed sustainability solutions were indeed implemented and complied with. No real scrutiny or real sanctions, thus no symbol effect. Together these issues create an important problem in the way of implementing necessary competition in tenders. We think this problem is extremely important and interesting and would like to see future research look into how sustainability is being measured by customers to ensure fair and correct competition on sustainability in tenders and procurement processes. Compellingly, a combination between a qualitative focused and quantitative focused research could strengthen the conclusions, by drawing sound statistical conclusions on the data provided and the hypotheses that are made. Even though, or perhaps especially because our own research didn´t find any research on this particular topic, we think this could be an extremely interesting avenue to explore further.

5.4.4 A deeper dive into why factors are weighed as they are

Furthermore, research question 4 in our study is limited to just consider and illustrate the weights the respondents gave to the different factors, and thus does not address why the respondents give the weights they did. Another potential area for further study on this topic is the perspective of inter-relational mechanisms. For example, it would be interesting to

examine the alignment and coordination of incentives for different market participants and inspect potential complex systematic and structural workings between them.

6. Conclusion

It remains to be seen whether, and to which extent, the incentive structures mentioned in this study have any explanatory power, but it indicates some apparent areas of potential, if one is to stimulate real action towards sustainable construction. There is a range of external and internal incentive schemes that could be addressed by stakeholders. The external incentive schemes range from knowledge, competence and perception with respect to sustainable construction, to direct customer considerations and regulatory considerations, amongst others. The internal incentive schemes range from moral considerations, to functional considerations and strategic considerations. There are indications that some of these incentive structures are perceived to weigh more by some, and less by others. Some of the most pressing incentive schemes include, but are not limited to, customer demand- and purchasing power, interpretation of national and international rules and legislation, implementation of system thinking, information flow between market participants, alignment of incentives, increased competitiveness, influence of top management and organizational culture considerations. Some of these incentive structures are more easily to tackle than others, due to the nature of them, and thus one should focus on the ones that are manageable. Although one should carefully examine larger sets of data to get a comprehensive list of tools to address these drivers and barriers, this study has some recommendation proposals for industry stakeholders for effective incentivizing with respect to sustainable construction. Firstly, regulatory bodies, such as the government, could to an increasing degree cooperate with the industry actors to make sure incentives are aligned and the businesses' needs are met. To facilitate, this cooperation could be further emphasized in long-term strategic frameworks. Assessing public procurement processes could also be a tool. Furthermore, monetary incentives from regulatory bodies are of importance, and the government could use tools like disposable equity and debt and design the structure surrounding these to address relevant issues. Internally, top-management and owners could set an organizational standard, aligning incentives through to all decision makers in the business, use their customer purchasing power to press their suppliers on sustainability, and create, retain and streamline sustainability protocols, systems and "tool-boxes" for all decision makers, potentially leading to more system thinking.

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Appendix

Appendix A: Interview guide

Introductory questions to ensure relevant background information

Q1: How long have you been working in the construction industry?
Q2: What fields in construction have you worked in and do you work in currently?
Q3: What department do you work in currently, and what tasks are relevant for your work in this department?

Questions related to the use of terms and relationship between sustainability/CE and occupation

Q4: By effect of your occupation, what are your relationship with sustainability?
Q5: By effect of your occupation, what are your relationship with CE?
Q6: What attitude does your business have with respect to sustainability and CE?
Q7: In what way does your business work with, and what measures does your business have with respect to sustainability and CE?

Questions related to incentive structures

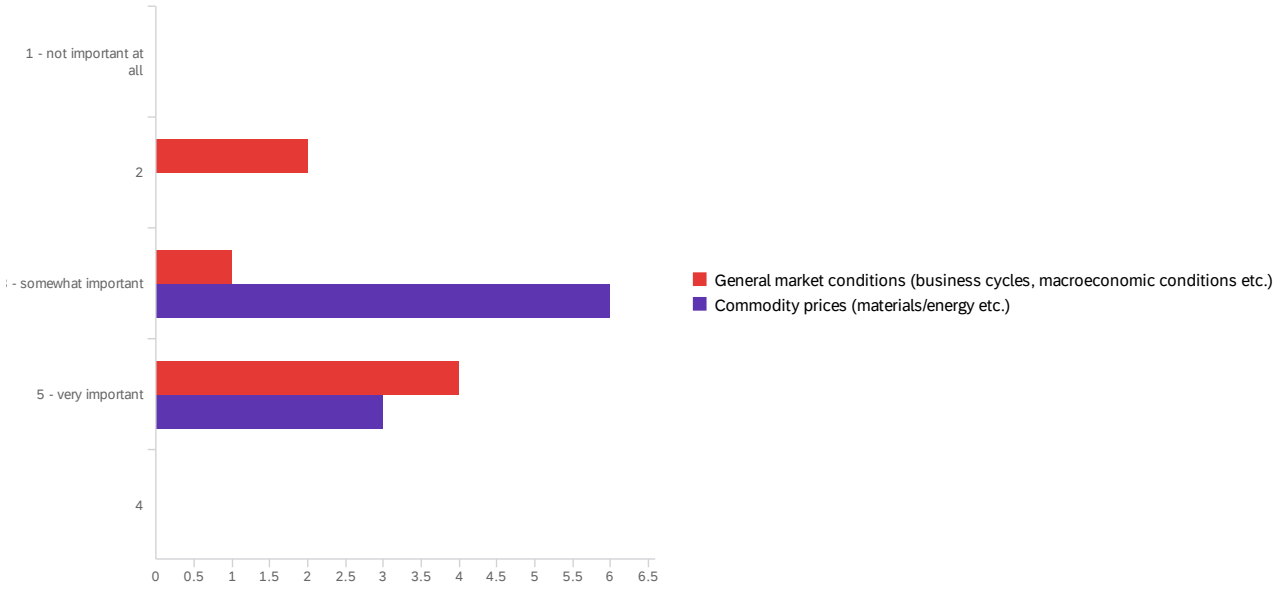
Q8: How do external factors affect the incentivization of businesses in the construction industry, with regard to increased focus on sustainability and CE?
Q9: How do internal factors affect the incentivization of businesses in the construction industry, with regard to increased focus on sustainability and CE?
Q10: Do you find that the various factors weigh equally heavily? Which factors do weigh the most?
Q11: According to you, how can one effectively incentivize businesses to increase the degree of focus on sustainability and CE?

Appendix B: Questionnaire

Default Report

Intervju masteroppgave
December 13, 2021 4:11 PM CET

Q1 - I hvor stor grad mener du følgende aspekter ved markedsforhold er motiverende for atferd rettet mot bærekraft?

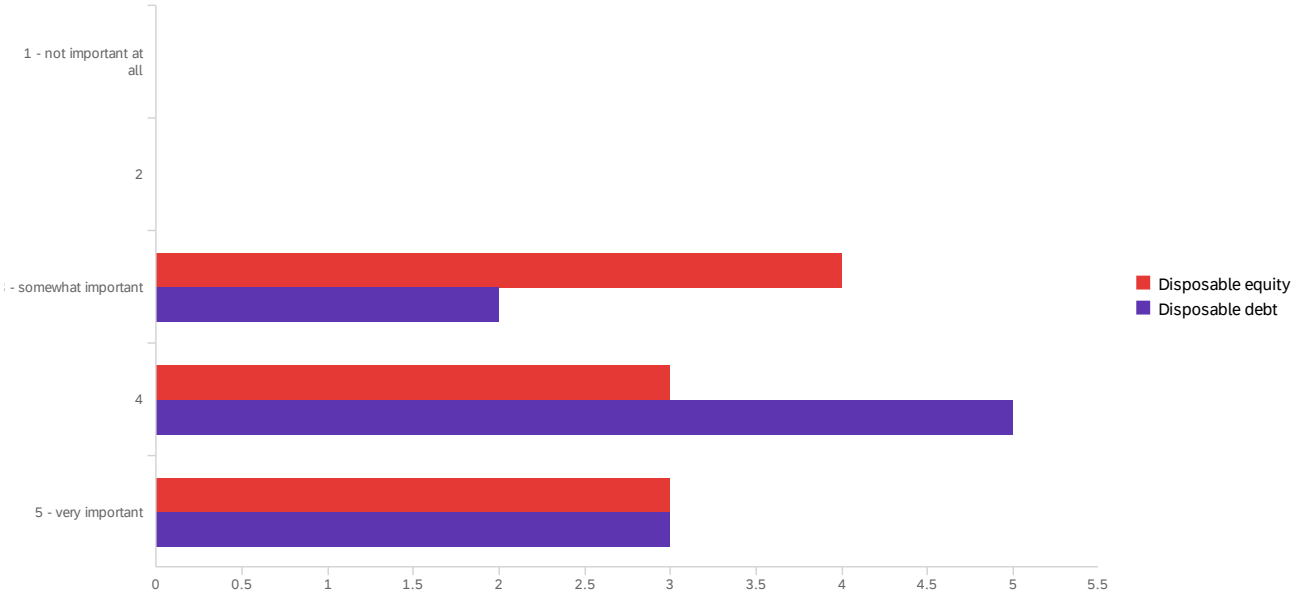


#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	General market conditions (business cycles, macroeconomic conditions etc.)	2.00	5.00	3.80	1.08	1.16	10
2	Commodity prices (materials/energy etc.)	3.00	5.00	3.50	0.67	0.45	10

#	Field	1 - not important at all	2	3 - somewhat important	5 - very important	4	Total
1	General market conditions (business cycles, macroeconomic conditions etc.)	0.00% 0	28.57% 2	14.29% 1	57.14% 4	0.00% 0	7
2	Commodity prices (materials/energy etc.)	0.00% 0	0.00% 0	66.67% 6	33.33% 3	0.00% 0	9

Showing rows 1 - 2 of 2

Q2 - To which degree do you think the following aspects regarding access to capital serve as a motivator for choosing sustainable solutions?

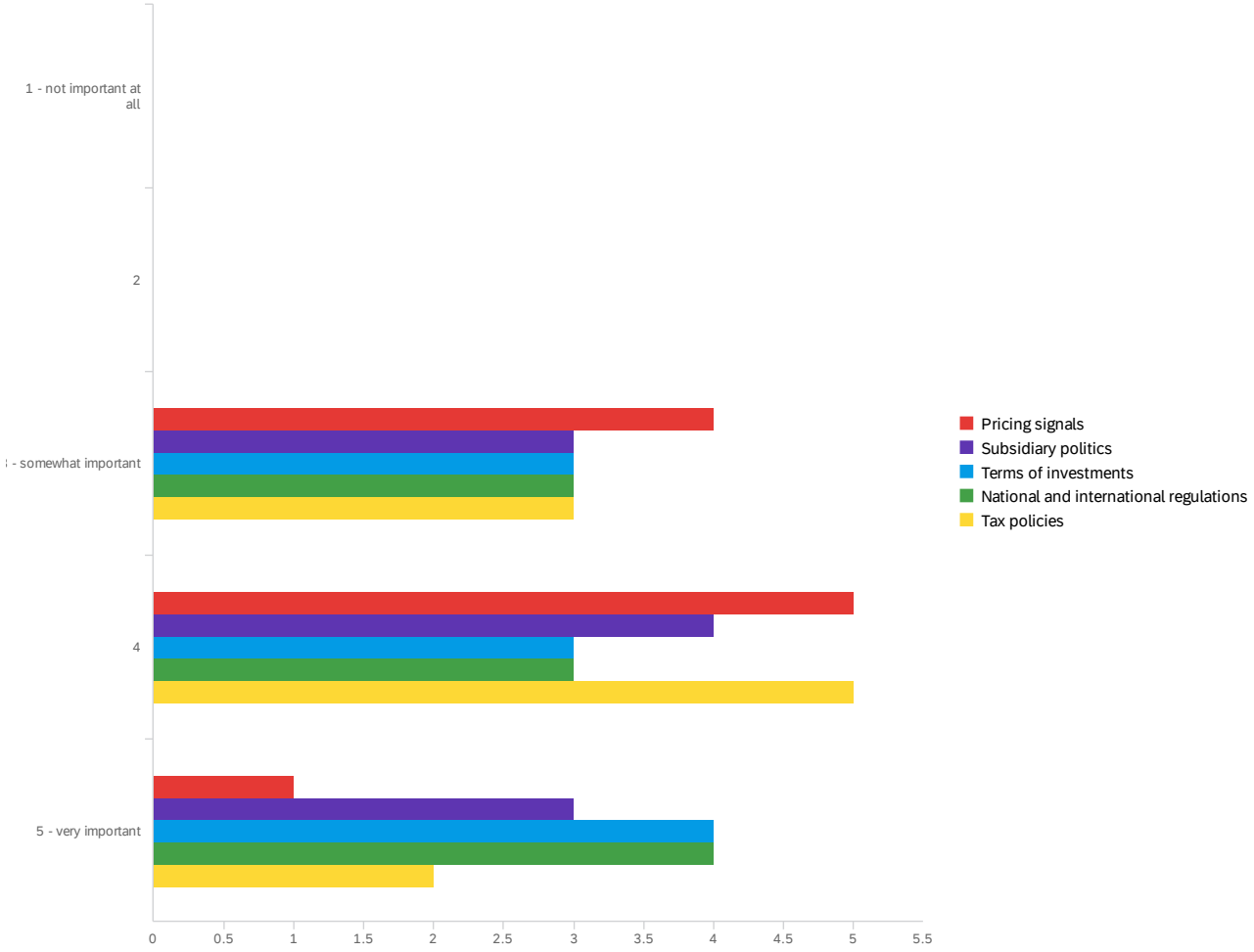


#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	Disposable equity	3.00	5.00	3.90	0.83	0.69	10
2	Disposable debt	3.00	5.00	4.10	0.70	0.49	10

#	Field	1 - not important at all	2	3 - somewhat important	4	5 - very important	Total
1	Disposable equity	0.00% 0	0.00% 0	40.00% 4	30.00% 3	30.00% 3	10
2	Disposable debt	0.00% 0	0.00% 0	20.00% 2	50.00% 5	30.00% 3	10

Showing rows 1 - 2 of 2

Q3 - To which degree do you think the following aspects regarding regulatory conditions serve as a motivator for choosing sustainable solutions?

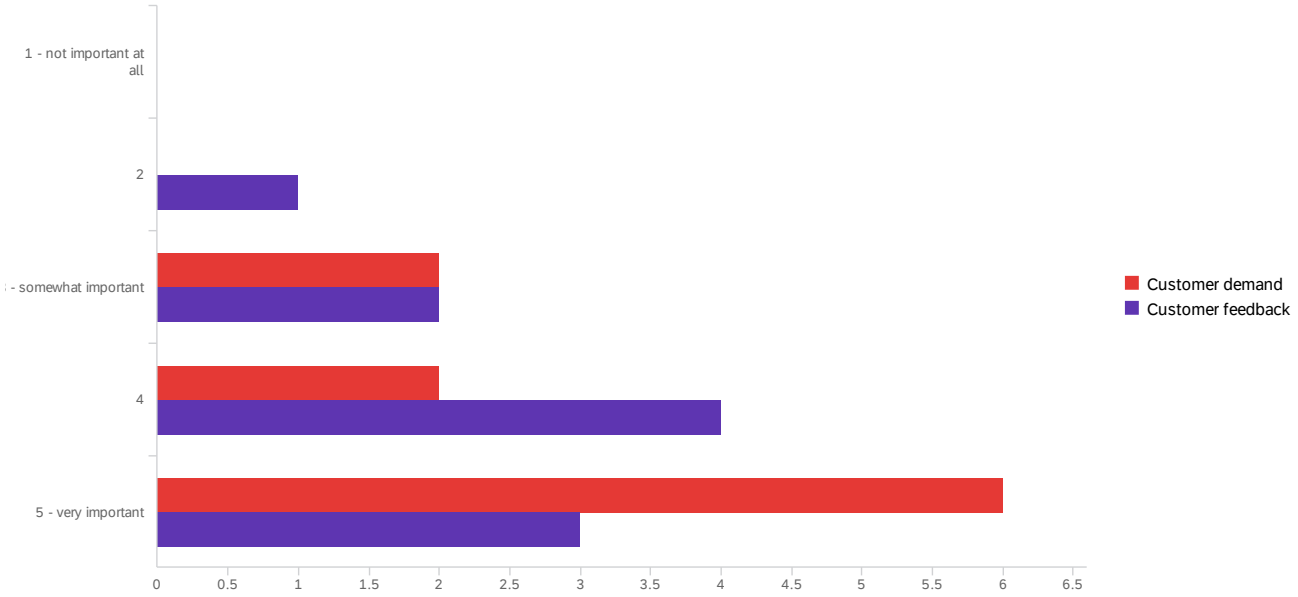


#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	Pricing signals	3.00	5.00	3.70	0.64	0.41	10
2	Subsidiary politics	3.00	5.00	4.00	0.77	0.60	10
3	Terms of investments	3.00	5.00	4.10	0.83	0.69	10
4	National and international regulations	3.00	5.00	4.10	0.83	0.69	10
5	Tax policies	3.00	5.00	3.90	0.70	0.49	10

#	Field	1 - not important at all	2	3 - somewhat important	4	5 - very important	Total
1	Pricing signals	0.00% 0	0.00% 0	40.00% 4	50.00% 5	10.00% 1	10
2	Subsidiary politics	0.00% 0	0.00% 0	30.00% 3	40.00% 4	30.00% 3	10
3	Terms of investments	0.00% 0	0.00% 0	30.00% 3	30.00% 3	40.00% 4	10
4	National and international regulations	0.00% 0	0.00% 0	30.00% 3	30.00% 3	40.00% 4	10
5	Tax policies	0.00% 0	0.00% 0	30.00% 3	50.00% 5	20.00% 2	10

Showing rows 1 - 5 of 5

Q4 - To which degree do you think the following aspects regarding customers serve as a motivator for choosing sustainable solutions?

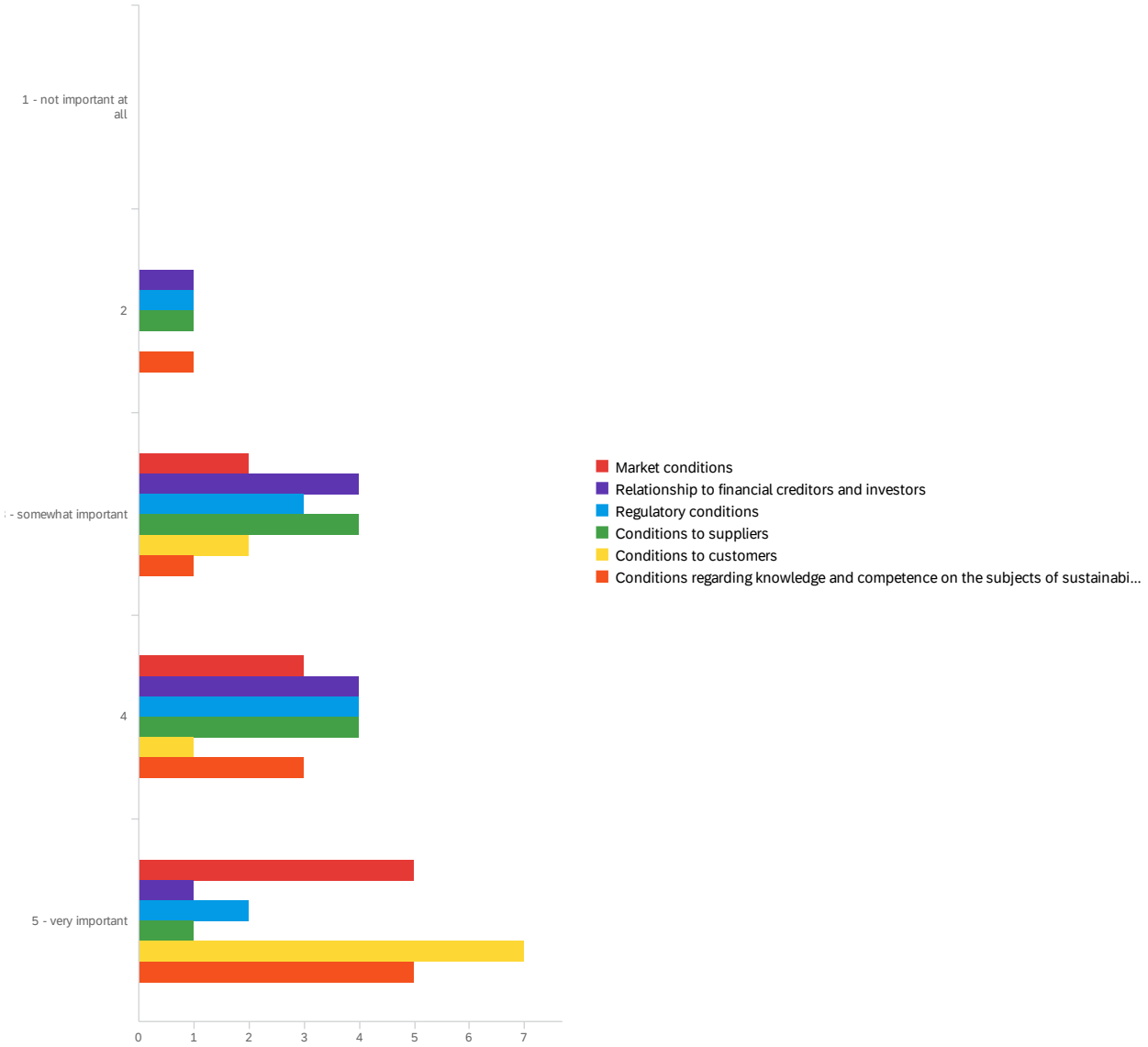


#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	Customer demand	3.00	5.00	4.40	0.80	0.64	10
2	Customer feedback	2.00	5.00	3.90	0.94	0.89	10

#	Field	1 - not important at all	2	3 - somewhat important	4	5 - very important	Total
1	Customer demand	0.00% 0	0.00% 0	20.00% 2	20.00% 2	60.00% 6	10
2	Customer feedback	0.00% 0	10.00% 1	20.00% 2	40.00% 4	30.00% 3	10

Showing rows 1 - 2 of 2

Q5 - To which degree do you think the following external factors serve as a motivator for choosing sustainable solutions?



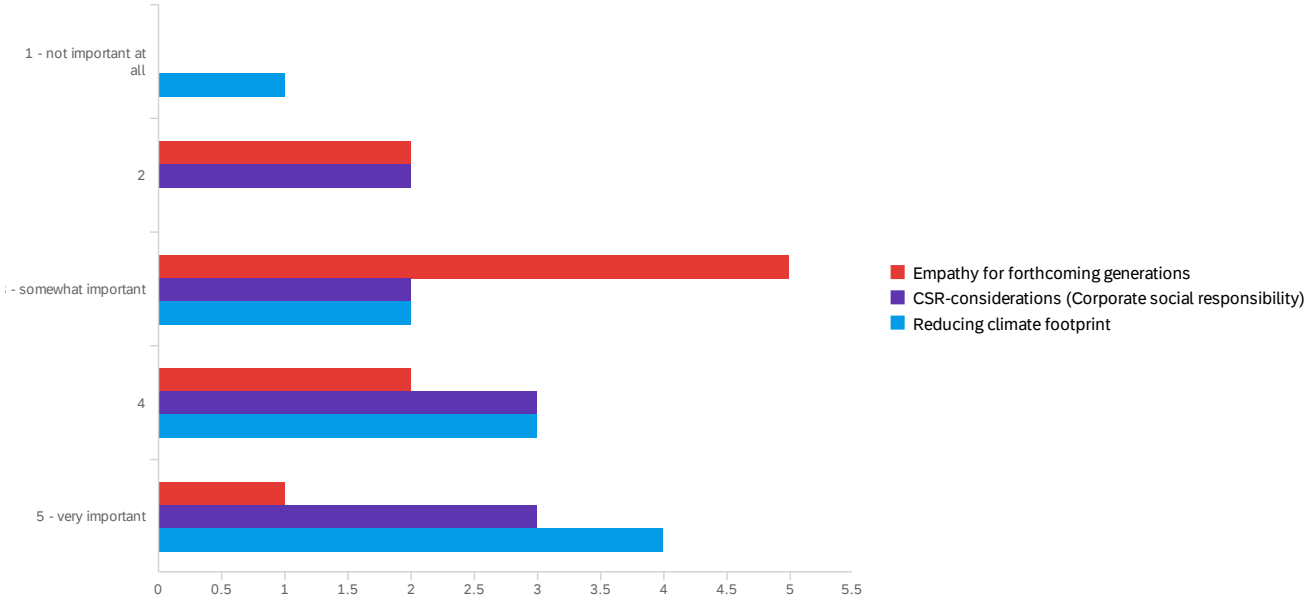
#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	Market conditions	3.00	5.00	4.30	0.78	0.61	10
2	Relationship to financial creditors and investors	2.00	5.00	3.50	0.81	0.65	10
3	Regulatory conditions	2.00	5.00	3.70	0.90	0.81	10

#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
4	Conditions to suppliers	2.00	5.00	3.50	0.81	0.65	10
5	Conditions to customers	3.00	5.00	4.50	0.81	0.65	10
6	Conditions regarding knowledge and competence on the subjects of sustainability and circular economy	2.00	5.00	4.20	0.98	0.96	10

#	Field	1 - not important at all	2	3 - somewhat important	4	5 - very important	Total
1	Market conditions	0.00% 0	0.00% 0	20.00% 2	30.00% 3	50.00% 5	10
2	Relationship to financial creditors and investors	0.00% 0	10.00% 1	40.00% 4	40.00% 4	10.00% 1	10
3	Regulatory conditions	0.00% 0	10.00% 1	30.00% 3	40.00% 4	20.00% 2	10
4	Conditions to suppliers	0.00% 0	10.00% 1	40.00% 4	40.00% 4	10.00% 1	10
5	Conditions to customers	0.00% 0	0.00% 0	20.00% 2	10.00% 1	70.00% 7	10
6	Conditions regarding knowledge and competence on the subjects of sustainability and circular economy	0.00% 0	10.00% 1	10.00% 1	30.00% 3	50.00% 5	10

Showing rows 1 - 6 of 6

Q6 - To which degree do you think the following aspects regarding moral factors serve as a motivator for choosing sustainable solutions?

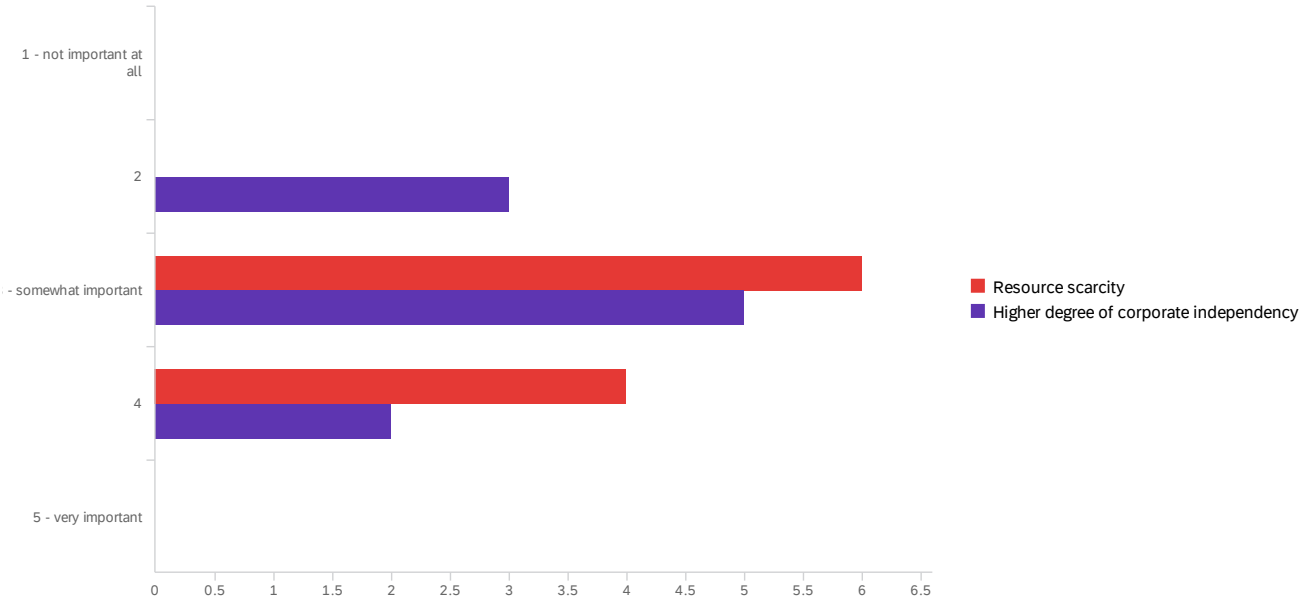


#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	Empathy for forthcoming generations	2.00	5.00	3.20	0.87	0.76	10
2	CSR-considerations (Corporate social responsibility)	2.00	5.00	3.70	1.10	1.21	10
3	Reducing climate footprint	1.00	5.00	3.90	1.22	1.49	10

#	Field	1 - not important at all	2	3 - somewhat important	4	5 - very important	Total
1	Empathy for forthcoming generations	0.00% 0	20.00% 2	50.00% 5	20.00% 2	10.00% 1	10
2	CSR-considerations (Corporate social responsibility)	0.00% 0	20.00% 2	20.00% 2	30.00% 3	30.00% 3	10
3	Reducing climate footprint	10.00% 1	0.00% 0	20.00% 2	30.00% 3	40.00% 4	10

Showing rows 1 - 3 of 3

Q7 - To which degree do you think the following factors regarding functionality serve as a motivator for choosing sustainable solutions?



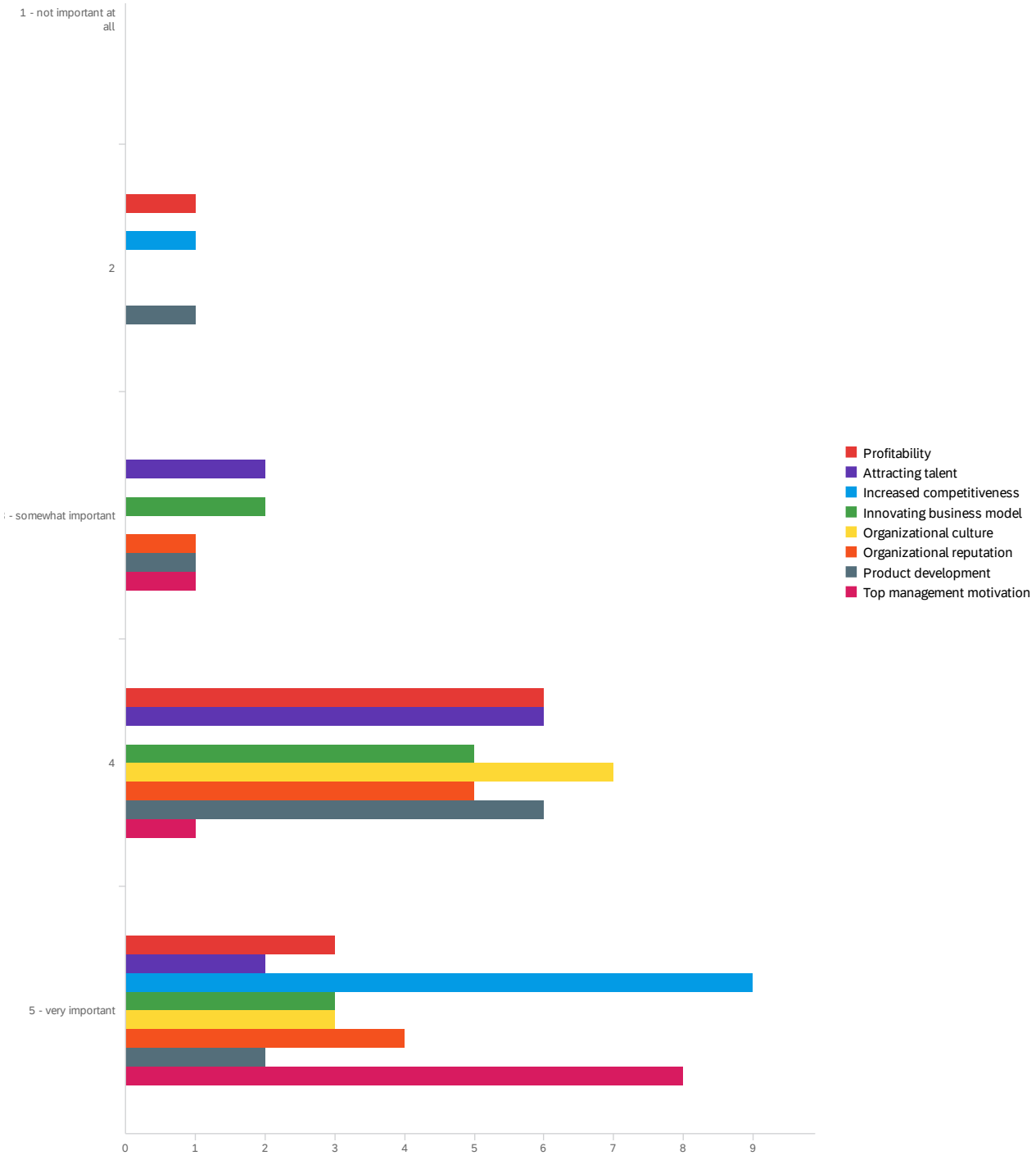
#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	Resource scarcity	3.00	4.00	3.40	0.49	0.24	10
2	Higher degree of corporate independency	2.00	4.00	2.90	0.70	0.49	10

#	Field	1 - not important at all	2	3 - somewhat important	4	5 - very important	Total
1	Resource scarcity	0.00% 0	0.00% 0	60.00% 6	40.00% 4	0.00% 0	10
2	Higher degree of corporate independency	0.00% 0	30.00% 3	50.00% 5	20.00% 2	0.00% 0	10

Showing rows 1 - 2 of 2

Q8 - To which degree do you think the following aspects regarding

organizational/strategic serve as a motivator for choosing sustainable solutions?



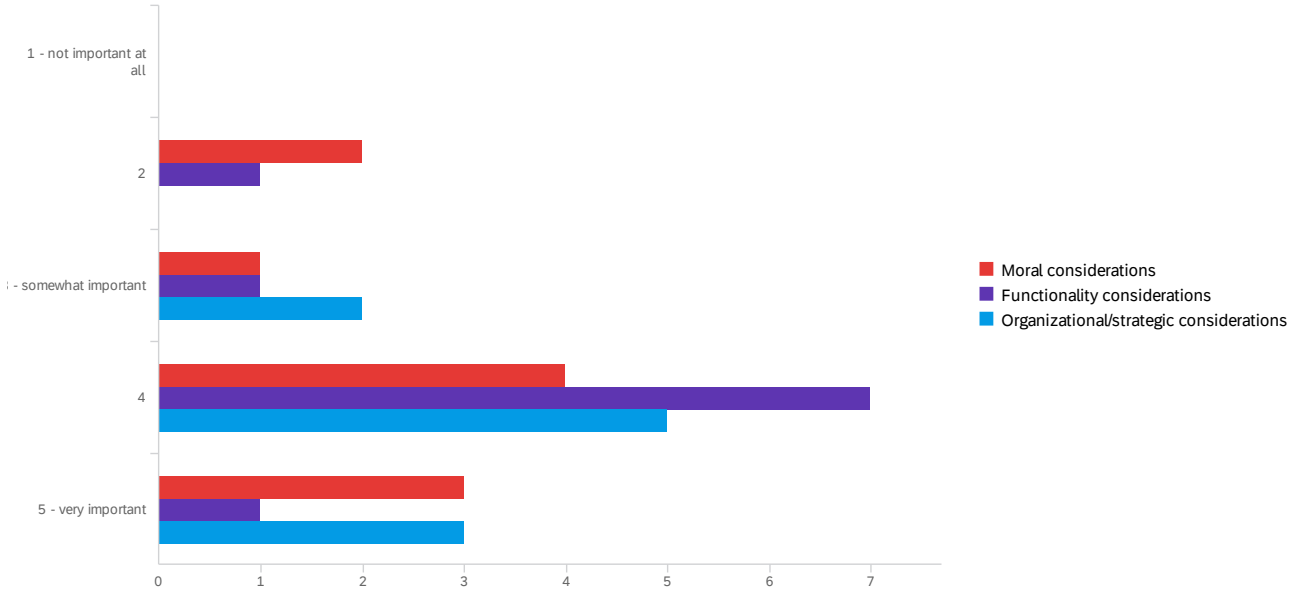
#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	Profitability	2.00	5.00	4.10	0.83	0.69	10

#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
2	Attracting talent	3.00	5.00	4.00	0.63	0.40	10
3	Increased competitiveness	2.00	5.00	4.70	0.90	0.81	10
4	Innovating business model	3.00	5.00	4.10	0.70	0.49	10
5	Organizational culture	4.00	5.00	4.30	0.46	0.21	10
6	Organizational reputation	3.00	5.00	4.30	0.64	0.41	10
7	Product development	2.00	5.00	3.90	0.83	0.69	10
8	Top management motivation	3.00	5.00	4.70	0.64	0.41	10

#	Field	1 - not important at all	2	3 - somewhat important	4	5 - very important	Total
1	Profitability	0.00% 0	10.00% 1	0.00% 0	60.00% 6	30.00% 3	10
2	Attracting talent	0.00% 0	0.00% 0	20.00% 2	60.00% 6	20.00% 2	10
3	Increased competitiveness	0.00% 0	10.00% 1	0.00% 0	0.00% 0	90.00% 9	10
4	Innovating business model	0.00% 0	0.00% 0	20.00% 2	50.00% 5	30.00% 3	10
5	Organizational culture	0.00% 0	0.00% 0	0.00% 0	70.00% 7	30.00% 3	10
6	Organizational reputation	0.00% 0	0.00% 0	10.00% 1	50.00% 5	40.00% 4	10
7	Product development	0.00% 0	10.00% 1	10.00% 1	60.00% 6	20.00% 2	10
8	Top management motivation	0.00% 0	0.00% 0	10.00% 1	10.00% 1	80.00% 8	10

Showing rows 1 - 8 of 8

Q9 - To which degree do you think the following aspects regarding internal factors serve as a motivator for choosing sustainable solutions?



#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	Moral considerations	2.00	5.00	3.80	1.08	1.16	10
2	Functionality considerations	2.00	5.00	3.80	0.75	0.56	10
3	Organizational/strategic considerations	3.00	5.00	4.10	0.70	0.49	10

#	Field	1 - not important at all	2	3 - somewhat important	4	5 - very important	Total
1	Moral considerations	0.00% 0	20.00% 2	10.00% 1	40.00% 4	30.00% 3	10
2	Functionality considerations	0.00% 0	10.00% 1	10.00% 1	70.00% 7	10.00% 1	10
3	Organizational/strategic considerations	0.00% 0	0.00% 0	20.00% 2	50.00% 5	30.00% 3	10

Showing rows 1 - 3 of 3

End of Report