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Master Thesis

Industry Institutions and Their Effects on Indirect Emissions in the Norwegian Architectural, Engineering and Construction Industry

A comparative case study of institutional aspects in state-owned and private firms

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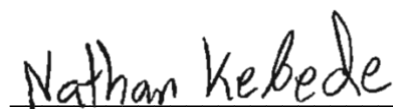
Finally, we would like to thank one another for fruitful discussions, support, laughs and the strengthening of our friendship. We made a great team, and we are incredibly proud of what we have done together.

Dedicated to Sosina and Kathrine

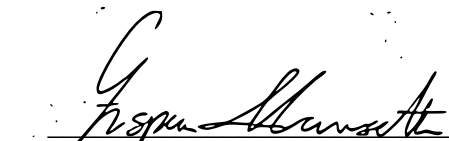
Men are what their mothers made them.

– Ralph Waldo Emerson

Oslo, June 30th, 2022



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Abstract

In our master's thesis, we examine which industry institutions affect actors' measures to reduce their indirect CO₂ emissions in the Norwegian architectural, engineering and construction industry. The industry is characterized by having some of the highest levels of CO₂ emissions in the world, thus making it an important field to explore. Through a comparative multiple case study, we examine institutional differences between one state-owned enterprise and two private firms, all three being high performers in terms of environmental development. However, general environmental development within the industry is slow, and the industry at large is defined by transactional and traditional methods of value creation. As such, we use the institutional theory of the firm to improve our understanding of how change happens in institutionalized fields. Through semi-structured interviews with highly knowledgeable informants and secondary sources of data such as environmental reports and contracts, empirical data was collected to enable a rigorous examination of the industry. Our findings suggest that factors such as differences in business models, financing, laws and regulations, norms and an overall transactional focus are the most important elements to understand how the field may change and reduce their indirect emissions. We finally suggest a model that informs our current understanding of how the industry may move toward the emission-free construction site.

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CHAPTER 1: Introduction

Among the most perplexing and pressing paradigms in the modern and global business environment, and arguably among the hardest challenges to overcome is the increasing focus on environmental responsibility while retaining profitability. Being a trending topic not only in management literature, but also for business practitioners, the need for change and environmental development has only accelerated in past years. Throughout the 21st century and onward, multiple international organizations have begun actively supporting a shift toward environmental development for businesses and organizations alike in order to halt the world's CO₂ emissions. Sustainable Development Goals (United Nations, 2018), substantial climate reports (United Nations, 2022), the European Union Green Deal (European Commission, 2019), and a new taxonomy for climate reporting (European Commission, 2020) are among the largest. The crux of the matter is that businesses all over the globe have slowly, yet steadily painted themselves into a corner, where the pursuit of profit maximization and expansion has led to self-imposed and stricter conditions for turning the vessel towards a more environmentally sustainable mode of operation. While this notion is true for most mature industries, the architectural, engineering and construction industry (hereafter referred to as the AEC industry) has been a prime example of this sentiment for some time, as it is among the most pollutive industries in the world (United Nations Environment Programme [UNEP] 2020). While the AEC industry is receiving steady attention in scientific circles, few studies have been conducted concerning how industry actors face the increasingly strict demands from governments, the EU, the UN and other legislative entities regarding the industry's indirect emissions, and how actors react to demands of rapid changes in operations and production. Even less so in Norway, where the industry seems to be outperforming its international counterparts, particularly in terms of energy performance (Friends of Gothenburg Innovation, 2021; The Explorer, 2021).

On a global scale, the AEC industry expends approximately 36-40% of all available energy and material resources and is synchronically responsible for around 40% of total CO₂ emissions worldwide in 2019 (Global Alliance for Buildings and Construction [GlobalABC], 2019; Norwegian Green Building Council [NGBC], 2020; UNEP, 2020). The Norwegian AEC industry, on the other hand, has slightly different metrics compared to the global industry. In Norway, around 90% of the

energy consumed for the operation of buildings is from renewable energy sources, making emissions related directly to energy consumption near zero (1-2% of total emissions) (NGBC, 2020). However, while the domestic industry has adopted great solutions for reducing energy consumption, the industry still faces a big obstacle in reducing emissions in general, as its output is tied to a vast network of indirect emissions. As much as 50% of a building's overall emissions happen during its construction phase, specifically during transport and production of the materials needed for the building (NGBC, 2020), making indirect CO₂ emissions a large obstruction. Furthermore, in terms of emissions, one may refer to them as tied to different scopes of operations. Scope 1 includes all direct emissions stemming from company-controlled resources and scope 2 includes emissions related to the purchase of energy. Scope 3 however includes all upstream and downstream emissions, from the outsourced production of materials to the transport of said materials to the construction site (Bernoville, 2022). Using the taxonomy proposed by the EU, a firm may without much difficulty present sufficient numbers as it measures the emissions of scope 1 and 2. Scope 3 is harder to detect, and may as such make green accounts look slightly more sustainable than they are in reality. Hence, we aim to examine how the domestic AEC industry, as an innovator and pioneer in the global scene, faces the third scope of indirect emissions.

We turn to the institutional theory of the firm to aid us in finding the answer and will be using contract-related literature from transaction cost economics (TCE) to inform the former view in a practical sense. The institutional theories in management literature explain how the firm interacts with its environment and how rules, norms, structures and routines as three pillars of institutions collide to form social guidelines organizations will follow (Scott, 2013). The institutional view will inform us on how change happens in institutionalized environments, and elements of the TCE are used to understand the contractual relations of the environment, as the industry is eminently transactionally focused. We intend to examine this using a multiple case study, where we compare one state-owned enterprise (SOE) with two private firms, all in the AEC industry, using methods inspired by Kathleen M. Eisenhardt (2021). Being a phenomenon-based study, we have attempted to gather data from these case examples with our base being institutional theories applied to the phenomenon we are investigating - institutional change in the AEC industry. The three firms are all active in bringing about environmental development, and

exhibit sustainability initiatives above the industry at large. Hence, primarily driven by the importance of the phenomenon, our research question is as follows:

Which institutional factors influence actors to take measures concerning indirect CO₂ emissions in the AEC industry?

By looking at three distinct cases where all claim to be forerunners in their respective sustainability efforts through their own means, we hope to highlight how the industry is handling indirect emissions related to the construction of their structures. On the one hand, the SOE is adamant in their position as a leader for bringing about a change to the industry, being backed by the state and multiple related SOEs, they have a plethora of ways to measure their emissions and strategize around this. On the other hand, the private enterprises have proven that creating buildings powered by their own energy expenses need not be as costly as once thought, and how recyclable materials through disassembly as opposed to demolition may be what the future holds. To the best of our knowledge, no studies have been conducted to examine the institutionalized environments AEC firms are embedded in with respect to indirect emissions. We see this research as a crucial step toward developing a world for tomorrow, as the next logical step for the research to take to move forward. As accentuated by Lima and colleagues (2021), there exists a need for further research on operations and maintenance stages of the industry work as opposed to the planning and execution stages, particularly with respect to sustainability. With our thesis, we hope to shed light on how institutions shape the industry as it exists on a day-to-day basis, and as such, heed the call to action pressed by the aforementioned authors. Our mission then becomes to understand what can be learned from these three cases when viewed considering how the whole industry exists. We hope to enlighten both scholars and practitioners with novel insights as to how institutional factors act as constraints or enablers to achieve change in institutionalized business environments.

CHAPTER 2: Literature Review

As we wish to understand which institutional factors influence the actors to take measures concerning indirect CO₂ emissions in the AEC industry, it is necessary to examine how one may understand change in institutionalized environments. Thus, we begin by presenting sustainability from the perspective of the AEC industry, to

discussing how the industry is organized and literature regarding contractual relations and contract characteristics. Thereafter we discuss institutional theories, more specifically related to institutional change, the theoretical perspective used to anchor our study on the phenomenon of institutional change in the AEC industry.

2.1 Sustainability

In recent years, a surge in environmentalism and activism has arisen in response to the toll industrial production takes on the earth. As voluntary organizations, NGOs and political groups allocate an increasing focus to sustainability and environmentalism, firms have begun adopting this view as well (Carrol, 2015). With increasing pressure from the aforementioned groups, governments, unions, and intergovernmental organizations such as the UN and the EU, most firms need to be on par with what is expected of them in terms of sustainability in order to stay afloat. As the world has grown more aware of how emissions are damaging the planet, the Brundtland report (Our Common Future) was published in 1986 - a report that systematically re-examined critical environmental issues and looked at ways to collaborate across borders to create novel, innovative and feasible approaches to the environmental problems the world faced (Steurer et al., 2005; World Commission on Environment and Development, 1987).

2.1.1 Sustainability in the AEC industry

Not long after the release of the Brundtland report and the 1992 Rio Earth Summit (United Nations, n.d.), sustainability was on the agenda for most firms, also in the AEC industry (Myers, 2005). The industry doing what it does best, i.e., constructing structures, naturally has a massive carbon footprint, accounting for as much as 36-40% of global energy usage in 2019 (GlobalABC, 2019; NGBC, 2020; UNEP, 2020). As such, the industry has a history of lagging behind in terms of environmental development and expresses a need to move toward more client-oriented methods of operation as opposed to the fragmented ways in which it has traditionally operated (Myers, 2005). By fragmented, the author is arguably referring to the way the industry is geared towards using multiple subcontractors that optimize for cost in a vacuum, rather than seeking collaboration in order to reduce emissions on a large scale (Myers, 2005; Æra Strategic Innovation, 2021). Part of the reason the industry has been lacking in sustainability efforts is the fact

that the industry is characterized by high factors of production paired with intensive labor and razor-thin margins (Æra Strategic Innovation, 2021).

As the industry has become more modernized, methods of analysis have been developed to control emissions to a higher degree than before, and Life Cycle Assessment programs are part of the sustainability journey for the industry. Transporting and production of materials also account for high emissions, and scholars have found that adopting methods for transporting and producing localized materials may reduce emissions manifold (Escamilla et al., 2016; Lima et al., 2021; Morel et al., 2001). Another interesting facet highly relevant to the AEC industry is that of scopes 1, 2 and 3, as briefly mentioned in our introduction. With scopes 1 and 2 being relatively clean in the domestic industry, scope 3 still remains an obstacle to overcome, likely due to the difficulty related to tracking indirect emissions (Bernoville, 2022).

2.2 Project-based organizations

Organizations within the AEC industry are often referred to as project-based organizations, due to their ordinary activities primarily being based on projects (Bresnen et al., 2004). Temporary projects are viewed as the project-based organizations' primary method of organizing their value creation. Moreover, they are characterized by operating within a large network of actors that provide access to the resources they require. Even though actors within these networks are tied together through contractual obligations, they remain legally independent (Manning, 2017; Scott et al., 2011). The utilization of projects to such a high degree entails extensive inter-organizational work and collaboration, which can foster institutional practices and norms (Bresnen et al., 2004). It has been argued that organizations both shape and are shaped by the environment in which they operate. Consequently, norms evolve within the industry and become internalized and mutually reinforced by the different actors (Scott et al., 2011). In a similar manner, due to the fragmented nature of the AEC industry where several parties are required to complete a product or service, institutionalized shared understandings and rules for collaboration are formed (Jones & Lichtenstein, 2008). These institutionalized norms and ways of interacting evolve over long periods of time, complicating the process of institutional change (Scott et al., 2011). Thus, altering these institutions to facilitate the reduction of CO₂ emissions is a complex process.

Projects within the AEC industry involve multiple parties, and different project delivery methods are used to decide how the project is organized, which parties form a contractual relationship with each other, and how risks and responsibilities should be allocated (Lædre, 2006). These project delivery methods are further implemented through multiple Norwegian Standard contracts. NS 8401 and NS 8402 are the Standard contracts primarily used between the owner and designers, engineers, and architects, while NS 8405, NS 8406, NS 8407 and NS 8417 are used for contracts between the owner and the contractor (Direktoratet for forvaltning og økonomistyring [DFØ], 2021; Lædre, 2006). The most common project delivery methods are Design-Bid-Build (DBB), implemented through NS 8405 and NS 8406, and Design-Build (DB), implemented through NS 8407 and NS 8417. Although there are not any Norwegian Standard contracts for Partnering, the delivery method is usually implemented through NS 8407 with additional requirements and specifications (DFØ, 2021).

The project delivery methods utilized within the industry can also be categorized into transactional and relational contracting, as well as traditional and non-traditional contracting. The traditional contracting approaches are defined as those that are similar or equivalent to the Norwegian Standard contracts, and generally entail less collaboration between the parties. On the other hand, the objective of most non-traditional contracting approaches is to foster collaboration (Lædre, 2006). The contracting literature distinguishes between transactional contracting and relational contracting, where the key difference is the degree of focus on collaboration between the contracting parties (Bygballe et al., 2019). Hence, one can argue that non-traditional contracting with a greater focus on collaboration moves toward relational contracting, as illustrated in figure 1.

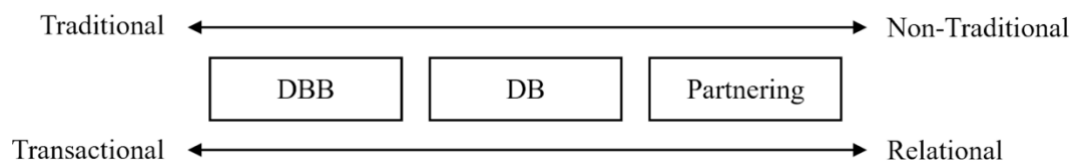


Figure 1: Contract characteristics. Source: Own analysis.

2.3 Contractual relations

Although transaction cost economics primarily explains organizational boundaries and reasonings behind the pairing of different governance structures and transactions, it also includes a substantial amount of research on contractual relations. Thus, the focal assumptions from the TCE perspective will be described below, followed by a detailed explanation and review of prior literature regarding traditional and non-traditional contracting approaches and what they entail. Lastly, the two contracting approaches are examined within the AEC industry.

2.3.1 Behavioral assumptions

Transaction cost economics has become both the primary theoretical framework for explaining organizational boundary decisions, but also one of the most dominant perspectives within management and organization studies in general (David & Han, 2004; Geyskens et al., 2006). The concept has its origin from Coase (1937), who put forward and discussed the notion of transaction costs and the effect it had on choosing between governance structures. However, Williamson's (1975) work was needed to operationalize transaction cost theory, which was achieved by demonstrating how the relative efficiency of alternative governance structures could be associated with observable characteristics of transactions. The transaction was defined as a transfer of a good or service across technologically separable interfaces, and transaction costs the economic counterpart of friction, hence the negotiation, monitoring, and enforcement costs (Jones & Hill, 1988). Among the antecedents of TCE are also economics, organization, and contract law literature (Williamson, 1981). In the ensuing years, numerous scholars have continued researching and empirically testing TCE, and it is also recognized as a branch of neo-institutional economics (Geyskens et al., 2006; Scott, 2013).

Despite it being widely recognized that complex and specific contracts are costly to write and enforce, transaction cost economics has investigated its reasons and consequences further through two behavioral assumptions. The assumptions are that human agents are subject to bounded rationality and opportunism (Williamson, 1981, 1985). Bounded rationality is what makes it impossible for agents to handle the complexity in all the relevant aspects within a contract, although Williamson (1981) states that they are intendedly rational. Hence, the intention of making rational decisions is limited by the capacity to evaluate all the possible alternatives

when making the decision (Hobbs, 1996). The cognitive limitations of human agents are thereby acknowledged, leading to the consensus that complex contracts are inevitably incomplete (Chiles & McMackin, 1996; Jones & Hill, 1988; Williamson, 1981, 1987).

The second behavioral assumption, opportunism, is defined as self-interest seeking with guile. Elaborating on his definition, Williamson (1985) included both “lying, stealing, and cheating” and “incomplete or distorted disclosure of information, especially to calculated efforts to mislead, distort, disguise, obfuscate, or otherwise confuse” (p. 47). Consequently, the assumption recognizes that human agents in some occasions will seek to exploit situations to their advantage. An important distinction here is that the assumption does not imply that this will always be the case, but merely recognizes the risk of opportunism being present (Hobbs, 1996). In an exchange between parties, opportunism becomes one of the key aspects during the choice of coordination. Without it, promises could be viewed as viable and sufficient safeguards for market transactions (Hill, 1990).

A third behavioral assumption has also been proposed, referred to as risk neutrality. However, the assumption has received scarce attention within the TCE literature. It has been argued that the adoption of Williamson’s (1985) focus on the attributes of the transaction rather than the risk preference of the transactors explains why this assumption has gone practically unnoticed (Chiles & McMackin, 1996).

2.3.2 Traditional contracting

The traditional contracting approaches have been defined as those that are either similar or equivalent to the Norwegian Standard contracts, and generally entailing less collaboration between the parties (Lædre, 2006). In the AEC industry, the traditional contracting approaches are primarily employed through two project delivery methods, namely Design-Bid-Build and Design-Build, illustrated in figure 2 and 3.

Design-Bid-Build. The traditional DBB project delivery method is known for separating the designer and contractor, as the owner establishes a completed design through contracting with designers and engineers (Gransberg & Molenaar, 2004; Gransberg et al., 2006). Subsequently, as the design and engineering phase is

finalized, the owner contracts and involves a contractor (El Asmar et al., 2013). Due to the contracting manner of DBB, with a complete design, embedded quality requirements, and often a specified completion date as well, it has been argued that the owner's primary interest is competition concerning price among contractors (Gransberg & Molenaar, 2004). The delivery method entails that the owner has more control and influence in the project, but it also allocates more risks towards the owner which can lead to extensive and detailed contracts (DFØ, 2019b; Gransberg et al., 2006).

Design-Bid-Build

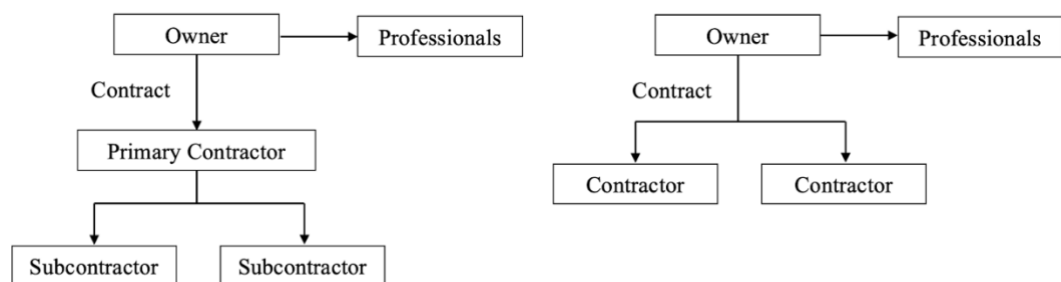


Figure 2: Design-Bid-Build. Source: Own analysis (adopted from DFØ, 2019a, 2019b; Lædre, 2006).

Design-Build. DB is a project delivery method that has the possibility of facilitating more collaboration than DBB, as the contractor is involved when approximately 20% of the design phase is completed (El Asmar et al., 2013). In essence, the owner contracts with a single entity that becomes responsible for both the design and construction (El Wardani et al., 2006; Lædre, 2006). Hence, the general contractor, also referred to as design/builder, is able to enter and influence the project at an earlier stage (Lædre, 2006). From the owner's perspective, the DB delivery method allocates more of the risks concerning time, cost, and quality to the general contractor (Gransberg et al., 2006; Lædre, 2006). Moreover, it demands less of the owner and can offer a greater overview of costs in the project at an earlier stage (DFØ, 2019a). On the other hand, quality can become the main aspect of competition, as the general contractors are primarily constrained by costs and a set schedule (Gransberg & Molenaar, 2004). The freedom given to the general contractor allows for a reduction in quality as long as the offered solution meets the minimum requirements (Lædre, 2006).

Design-Build

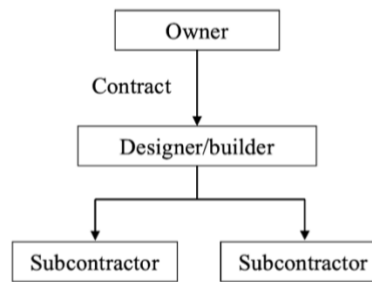


Figure 3: Design-Build. Source: Own analysis (adopted from DFØ, 2019a, 2019b; Lædre, 2006).

2.3.3 Non-traditional contracting

Project owners within the AEC industry also have the possibility of choosing non-traditional contracting methods, encompassing contracting aspects that deviate from the traditional contracting approaches. The objective of most of the non-traditional contracting approaches is to increase collaboration between the parties within a project. This can be achieved through measures such as early involvement of designers, engineers, and contractors, but also retaining and continuing the involvement past the design phase. These measures also have the ability to limit and control uncertainties through the knowledge possessed by the different parties (Lædre, 2006).

Partnering is one example of non-traditional contracting, where owners, users, designers, engineers, and contractors are involved in the design phase. The delivery method attempts to allocate risks in a manner that reduces the need for risk premiums, and foster innovation through collaboration (DFØ, 2020; Lædre, 2006). Partnering to DB and Partnering with incentive are two relevant approaches, where these key participants in a collaborative manner design and plan the project. However, Partnering to DB develops into a Design-Build contract, while contractors are paid based on performance in regard to the target cost in Partnering with incentive. Lastly, Public-Private Partnership (PPP) can also be utilized, where the general contractor takes on the role as owner of the project for approximately 20-30 years (DFØ, 2020).

The explicit focus on collaboration within non-traditional contracting directly ties it to relational contracting (Bygballe et al., 2019; Lædre, 2006). Scholars have argued that pressure to sustain ongoing relationships and the need for flexibility is a result of the increased duration and complexity of contracts. These are some of the conditions that lead relations to take on the properties of a small society, as the norms created between the parties go beyond the specific exchange and its immediate processes (Macneil, 1977; Williamson, 1979). Relational contracting also acknowledges that inter-organizational exchanges are embedded in social relationships, and that these relationships can strengthen cooperation and allow for more flexibility (Ng et al., 2013). Although formal documents may still be used, the integrated flexibility is based on the relationship that has developed rather than the original agreement or contract itself. Hence, any formal documents must reflect the focus on the entire relationship and are only viewed as a part of the system of relational contract law, in opposition to classical contract law (Macneil, 1977).

In essence, relational contracting is based on recognizing the mutual benefits of a more cooperative relationship between the parties in an exchange (Rahman & Kumaraswamy, 2002). Due to its advantages stemming from the utilization of the tacit knowledge attained by those involved, relational contracting is generally more people-oriented. Consequently, it differs from transactional contracting as it entails a self-enforcing safeguard based on the future value of the relationship rather than more formal safeguards and legal mechanisms (Colledge, 2005; Geyskens et al., 2006; Rahman & Kumaraswamy, 2002; Telser, 1980). Lastly, the contracting approach involves personal involvement, extensive communication, and both benefits and burdens are shared between the parties in a transaction (Macneil, 1974). Based on some of these characteristics, it has been argued that relational governance can provide more effective governance mechanisms, particularly in transactions where close collaboration might yield positive results (Colledge, 2005).

2.3.4 Contract characteristics in the AEC industry

Several scholars have argued that there are multiple characteristics within the AEC industry that makes it wise to choose a more relational approach. The industry is described as highly specialized, complex, fragmented, and involving multiple parties. Contracts are also viewed as evolving, due to the underlying circumstances

that may change over time (Colledge, 2005; Rahman & Kumaraswamy, 2002, 2004). The facilitation of knowledge and information sharing, fostering of mutual trust, and flexibility offered by relational contracting is what makes it more suitable for such a transaction (Colledge, 2005; Jeffries & Reed, 2000). Due to the specialization within both design and construction activities as well, it is also less efficient for general contractors to undertake all tasks within their own organization. Hence, the industry is characterized by specialized firms that employ their skilled labor and knowledge across multiple projects, creating a mutual dependency between the parties (Reve & Levitt, 1984).

Moreover, the difficulties of maximizing value within construction projects have been tied to the contractual approaches, and transactional contracting has received most of this criticism. Matthews & Howell (2005) argue that the contractual structure at the project level inhibits innovation, coordination, and cooperation. The parties do not have an incentive to coordinate, and are to some extent rewarded for being opportunistic during the bidding phase. Consequently, the subcontractors involved are predominantly focusing on optimizing their own performance and maximizing their individual profits (Ghassemi & Becerik-Gerber, 2011; Matthews & Howell, 2005).

Opportunism can also lead to information asymmetries which can be strategically exploited during projects (Reve & Levitt, 1984). In a similar vein, Fischer et al. (2017) state that transactional contracting breeds competition rather than cooperation in this situation, and argues that it is partially due to the misalignment of incentives between the parties and the construction project as a whole. A consequence of these adversarial contracting approaches and the opportunistic behaviors is that the industry has become both less efficient and productive, and resulted in lower levels of innovation (Colledge, 2005).

The AEC industry is also characterized by high levels of uncertainty and volatility. Volatility here refers to the unpredictability and rate of change in an environment over a period of time, and thus creates uncertainty concerning future conditions (Carson et al., 2006). This uncertainty stems from factors such as the number of parties involved, unique and specialized sets of input factors, and site conditions (Eccles, 1981). To address this uncertainty, relational contracting has been viewed

as superior due to the flexibility offered by the intentionally incomplete agreements (Jeffries & Reed, 2000; Rahman & Kumaraswamy, 2002, 2004). However, in contrast to these claims, Williamson (1991) argued that relational contracting is less effective in addressing uncertainty. His view on this was based on the mutual consent required to make adaptations during unpredictable circumstances, making it less effective than if such adaptations could have been made unilaterally.

2.4 Institutional theory of the firm

In order to thoroughly understand the antecedents of industrial change on a large scale, the institutional theory of the firm is a natural place to begin. Being among the management theories that have risen in popularity in later years, it is now being recognized as a valid theory used to explain the conceptual environments firms are situated within. The institutional theory of the firm was first presented in Selznick's *Foundations of the theory of organizations* (1948), then in the contemporary works of March & Simon, *Organizations from 1958* (1993), though formalized into the theory it is today later, as the theories gained traction and began to converge. An important distinction to make is the difference between an organization and an institution, the latter being defined as "durable sociocultural structures that provide stable sets of meanings, rules, and norms on which organizations depend for their understanding of appropriate behaviors" (Micelotta et al., 2017, p. 1889). A key facet of the institutional view is that firms are similar in that they have the same goals and operate in similar ways relative to one another, often making them theoretically identical (DiMaggio & Powell, 1983; Scott, 2013; Zhao et al., 2017). The theory is built around the notion that organizations come to be as a result of rationalized and institutional rules, norms and traditions (Meyer & Rowan, 1977; Scott, 2013). An institution can be anything from norms, to a set of rules, to strict laws, to the modus operandi of the environment in question; in layperson's terms, how things are done.

DiMaggio & Powell (1983) emphasize how social conditions and elements are key to how organizations are formed, and expectations from society shape the legitimacy of the organization in question. Scholars furthermore accentuate the importance of legitimacy, and how institutional logics, norms, rules, laws and regulation shape an organization's perceived and actual legitimacy (Scott, 2013; Suchman, 1995). Furthermore, in the seminal works of Scott (2013), he emphasizes

the three pillars of institutions, being essential elements of an institution, so to speak. The Regulative Pillar are the rules, laws and regulations - both formal and informal - that are present in all institutions. There lies an expectancy to follow these, and any deviation will likely lead to consequences. The second pillar is the Normative Pillar, which contains the perception of how things should be done; how a goal should be reached through legitimacy, which extrudes ethics and individuality. In other words, norms. Finally, the Cultural-Cognitive Pillar, a dimension that reflects society at large, particularly in regard to culture. Subconscious schema enables interpretation and the ability to give meaning to commonly accepted logics. An important facet in the third pillar is that institutions will be seeking to reach goals while embedded in the culture of which said institution is operating. Routines and best-practice are often taken for granted, because of the notion of “how things are done and how they always have been”. As such, the institutional theory of the firm plays a key part in understanding how an industry can be molded to move in a particular direction, as the systems and norms the institutional theory of the firm discusses can describe both current and future behavior of the industry and the firms embedded within it (Scott, 2013).

As the institutional theory of the firm is generally describing organizations as systems of norms, structures, routines and artifacts defining what organizations ought to be (Scott, 2013), they could in many ways be described as a supplementary theory to the industrial organization and resource based view. According to Peng et al., (2008), the institutional theory of the firm is part of the strategy tripod along these other two theories, arguably being of a more conceptual and abstract nature compared to the previously mentioned, more mechanistic theories. Hence, institutions can be any and all elements that affect a firm and how it runs, particularly those that shape the industry and exist as norms or common practices. Governments and regulatory bodies become particularly important to institutional theories, as regulatory decisions and institutional pressures may shift an industry in one direction or the other (Berrone et al., 2013).

2.4.1 Institutional change

Among the greatest challenges in creating institutional change is the fact that an organization will face multiple contradictory institutional logics at the same time, only adding complexity to the environment (Greenwood et al., 2011). Hence,

attaining institutional change in such complex environments proves to be an intricate and sophisticated challenge, not only to describe but also to successfully accomplish. As we seek to understand institutional field change, as opposed to changes in smaller spheres such as organizations, we will need to apply institutional theories that help explain how changes happen on larger scales, not only to the logics local to a firm, but to the collective logics, norms and understandings all firms in the field faces daily. To tailor this problem to our selected case, we use sets of theoretical frameworks: institutional fields and logics, and three pathways of institutional change.

2.4.1.1 Institutional logics and fields

Highly relevant to our chosen industry is the notion of contradictory institutional logics, which may act as inhibitors for attaining change. Institutional logics are generally described as beliefs, values, symbols or practices, all socially constructed, crystalized patterns (Thornton & Ocasio, 2008; Winch & Maytorena-Sanchez, 2020). A field exhibiting more than one institutional logic is referred to as having institutional complexity, meaning that contradicting “truths” may clash (Greenwood et al., 2011; Winch & Maytorena-Sanchez, 2020). As such, debunking these “truths” and understanding how to navigate an institutionalized landscape may become increasingly difficult. However, when working on projects within institutionalized fields, Winch and Maytorena-Sanchez found that project work may act as “vectors of change in institutional fields by offering bounded spaces for working through the implications of institutional complexity.” (2020, p. 368). This contention opens up an interesting understanding of a possible aperture for attaining change, even in these institutionalized areas, as projects are often subject to their own rulesets, logics and ways of operating as temporary organizations. In other words - projects are bounded spaces excerpted from the claws of institutional logics.

Related to institutional logics are institutional fields, described as an arena where organizations and individuals share a universal understanding and interact with one another as opposed to those outside of said field (Furnari, 2016). In other words, “*a location of many of the institutions that guide everyday behavior*” (Zietsma et al., 2017, p. 3). Fields may be eminently helpful to use for understanding how institutional change happens in whole fields, as opposed to firms or organizations as the literature tends to discuss (Mazza & Pedersen, 2004). Field change in

institutional theory stresses that change happens in fields similar to how it happens on the local level in organizations, namely as a response to institutional pressures. However, an added dimension of institutional field change comes in the form of exogenous and endogenous changes (Scott, 2008). Exogenous changes may be brought on by disruptions stemming from peripheral systems of logics that destabilize current rules, such as social, economic or political regulations, or simply by invaders from “foreign” fields (Scott, 2008; Thornton, 2004). Endogenous changes may come about from discrepancies between macro systems and micro activities as responses to local conditions, or deviations and paradoxes between institutional frameworks or elements (Dacin et al., 2002; Scott, 2008).

2.4.1.2 Pathways of institutional change

In later years, the institutional theory of the firm has been further developed to be less about durable socio-economic and socio-cultural structures, and more about how said structures change and evolve over time (Dacin et al., 2002; Micelotta et al., 2017). How the aforementioned structures change will, according to Micelotta et al. (2017) depend on three triggers, namely exogenous changes, institutional entrepreneurship and improvement in micro-processes and practices. Worth mentioning are how these triggers are vast and complex, and may take several years to implement, both slowly and almost subconsciously (Micelotta et al., 2017).

Exogenous changes in institutional environments. Organizations will generally have a hard time adapting to environmental changes, major or minor, rapidly enough to reinstate the old institutional norms (Lee & Pennings, 2002, as cited in Micelotta et al., 2017). Through changes in legitimacy-granting criteria and deinstitutionalization, isomorphic adaptation and shifts in institutional logics and coevolution of environment and institutions, new organizational forms and practices may be formed and organizational change can happen (Micelotta et al., 2017). This means that exogenous shocks in the form of changes made to the common logic in an industry through governmental regulations, incentives or concessions could fundamentally change how business is conducted and processes in relation to the buildings raised (Mazza & Pedersen, 2008).

Institutional entrepreneurship. This is where agency and the cognitive elements of institutional change become relevant. The methods of attaining institutional

entrepreneurship are segmented into non-disruptive cultural entrepreneurship and disruptive strategies. The former describes how elements such as rhetoric, framing and theorization may lead to new practices and forms that better fit the institutions operating in the environment. The latter describes collective action, resource mobilization and framing contests as methods of reaching changes in institutional fields and logics, or deinstitutionalization of practices (Micelotta et al., 2017). Framing contests have also been described by Kaplan (2008) as how a strategic choice has to be understood in the context of the external environment. When new methods of conducting business are commonly accepted and substantiated, they may thus lead to prolonged and persistent change in the institutionalized environment (Micelotta et al., 2017).

Improvement in micro-processes and practices. The final trigger Micelotta et al. describes is improvements in micro-processes and practices. They exclaim that many of the perceived notions of how institutional change happens are through dramatic environmental shifts done purposefully by very influential and powerful actors in the environment. On the contrary, evidence shows that much of the institutional change that happens in business environments is simply the result of “mundane activities of practitioners struggling to accomplish their work” (Smets et al., 2012, p. 887, as cited in Micelotta et al., 2017). As such, simple and incremental changes to how processes are done may collectively lead to the emergence of changes in institutional fields and logics, not entirely dissimilar to how “feeling your way” may lead to new strategies on a micro-level (Bouty et al., 2019; Mintzberg & Waters, 1985).

As such, institutions can act as both barriers and enablers for activities, goals and innovation. Specifically, in our thesis, elements of interest such as contracts, regulations, law, incentives and industry norms become important to analyze. The modus operandi of the Norwegian AEC industry has changed a lot over the years, only to have been accelerated in the last (Federation of Norwegian Construction Industries [BNL], n.d.).

2.5 Discussion of literature

In chapter 2 of the thesis, we have discussed and reviewed the existing literature and understanding of sustainability, projects and project-based organizations,

contractual relations and institutional theory. The literature review should shed light on the most important aspects of existing knowledge about the subject we have set out to analyze, and will aid us greatly in answering our research question: *Which institutional factors influence actors to take measures concerning indirect CO₂ emissions in the AEC industry?* To manage our research question, we have decided to split the question into three sub-questions that each answer an important facet of the main question (see Figure 4).

Firstly, rooted in our inductive approach, the differences between SOEs and private firms were found pressing enough to warrant further investigation during initial meetings and discussions with experts. By separating the two entities and creating a sub-question tailored to identify their differences, we presume to find differing institutional factors that make the reduction of indirect emissions simpler or harder depending on where in the institutional field the firm is situated. These factors are identified as any and all ways of operating that may differ between SOEs and private firms.

How do institutionalized practices differ between SOEs and private firms?

Moreover, we have explored the literature related to institutional theory, particularly change in institutional logics and fields. As the industry accounted for 36-38% of global energy usage in 2019 and has a history of being underdeveloped regarding environmental development, change is needed (GlobalABC, 2019; Myers, 2005; NGBC, 2020; UNEP, 2020). However, accomplishing change that leads to the reduction of indirect CO₂ emissions can become complicated. Shared understandings among the actors evolve over time, and an attempt to create institutional change might face multiple contradictory institutional logics simultaneously (Dacin et al., 2002; Furnari, 2016; Greenwood et al., 2011; Micelotta et al., 2017).

How do institutional factors enable or constrain the reduction of indirect CO₂ emissions?

Lastly, to rigorously investigate institutional change within the AEC industry, it is necessary to examine the contractual relations among the actors in the fragmented

industry (Jones & Lichtenstein, 2008). The traditional contracting approach within the industry was found to be more transactional in nature, primarily based on the lack of focus on collaboration (Bygballe et al., 2019; Lædre, 2006). Based on the characteristics of the AEC industry, where value creation is dependent on multiple actors, it can be argued that collaboration becomes essential to implementing more environmentally friendly solutions. Interestingly, the objective of non-traditional contracting approaches is to foster collaboration (Lædre, 2006).

How does contractual relations affect the actors' ability to implement more environmentally friendly solutions?

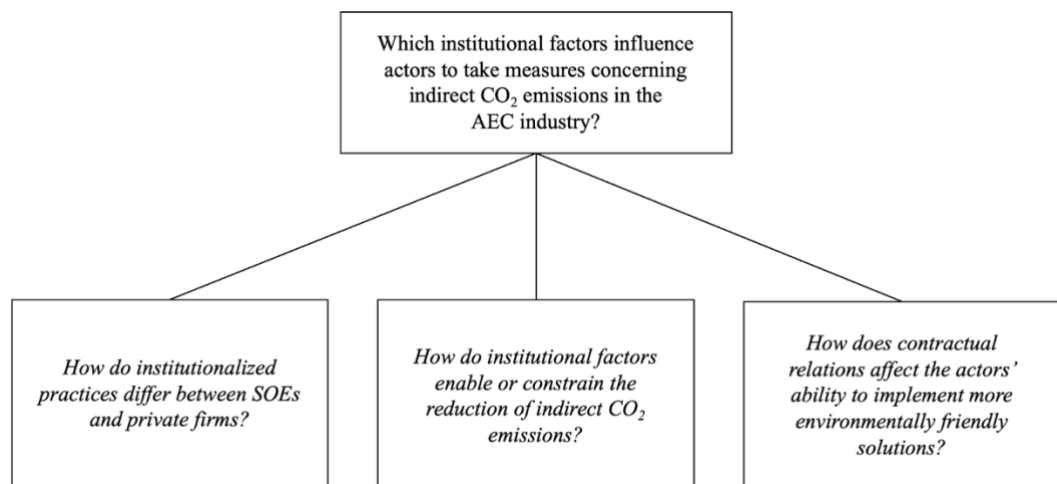


Figure 4: Research question and sub-questions. Source: Own analysis.

CHAPTER 3: Methodology

3.1 Research design

The focus of the study is to identify which institutional factors within the AEC industry influence the actors to take measures concerning indirect CO₂ emissions in the AEC industry. Thus, as the focus of the study is to understand the dynamics present within a single setting and phenomenon, we chose to employ a qualitative research method through a multiple case study (Eisenhardt, 1989). Our emphasis is on a specific case, referring to factors influencing actors embedded in a particular context, which is why we have chosen a qualitative method (Miles & Huberman, 1994). Case studies commonly combine data collection methods such as archives,

observations, and interviews, and thus may use both qualitative and quantitative data. However, qualitative data generally provides an explanation or thorough understanding of the dynamics underlying the relationships observed and are viewed as especially helpful in the detailed examination of cases (Bryman & Bell, 2015; Eisenhardt, 1989; Gehman et al., 2018; Yin, 2009). Additionally, as qualitative data is particularly helpful for understanding the theoretical reasons for why relationships exist, it was chosen to help establish internal validity (Eisenhardt, 1989). The study has also taken a holistic rather than an embedded approach, due to our single unit of analysis (Yin, 2015).

Case studies have been argued to be particularly advantageous when exploring how and why questions, and questions that deal with the tracing of operational processes over time (Eisenhardt & Graebner, 2007; Yin, 2009, 2018). Hence, rooted in our research question, we will use multiple cases to conduct our study. Using multiple cases normally generates more robust, testable, and generalizable theory than research conducted based on a single case. Additionally, it enables us to compare between cases to examine whether emerging findings are consistent within several cases or simply unique for the specific case, and thus creates a stronger base for theory building (Eisenhardt & Graebner, 2007; Yin, 2009, 2015). Based on a replication logic, cases confirming emerging relationships can also enhance the validity of any relationships we identify, while contradicting cases provide the opportunity to refine them (Eisenhardt, 1989). The use of multiple cases is also advantageous for our study, as we are seeking to identify theoretical constructs at an abstract level (Eisenhardt, 2021). Hence, a multiple case study design is employed to draw a single set of conclusions across them and to jointly examine the phenomenon (Bryman & Bell, 2015; Yin, 2009).

In essence, we have chosen a research design that is primarily based on the “Eisenhardt method”, an approach that has become the most used framework for analyzing qualitative data (Bryman & Bell, 2015). The inductive method enables us to build theory from multiple cases through the development of constructs and theoretical propositions that can explain a phenomenon (Bryman & Bell, 2015; Eisenhardt & Graebner, 2007; Saunders et al., 2009). However, it is important to justify the theory building when utilizing this method by clarifying the significance of the research question and the reasoning for choosing an inductive study. The

challenge of justifying the necessity of inductive theory building depends in part on whether the research is driven by existing theory or the phenomenon (Eisenhardt & Graebner, 2007). As explained and justified in detail in the introduction, our phenomenon-driven research question stems from the importance of the phenomenon itself and the lack of a clear explanation.

3.2 Theoretical sampling

An important challenge that needs to be addressed when doing case studies is the selection of cases. As the purpose of our research is building theory rather than testing, we found theoretical sampling of cases as suitable for our multiple case study (Eisenhardt & Graebner, 2007). Based on our open-ended research question concerning sustainability within the AEC industry, we chose a well-established and leading SOE within the industry. However, during initial meetings and interviews we were given clear indications of how sustainability and the implementation of environmentally friendly solutions differed between SOEs and private enterprises. Thus, to obtain empirical data, we found it beneficial to include two private actors as well. The three cases were eventually chosen due to their potential ability to explain the institutionalized factors influencing actors within the AEC industry to take measures concerning indirect CO₂ emissions. Specifically, the cases were chosen based on three criteria: replication, comparison ability and elimination of alternative explanations, and access to data (Eisenhardt & Graebner, 2007; Yin, 2009).

To enable the confirmation of emerging relationships between cases, and in accordance with a replication logic, we chose three actors who operate within the AEC industry (Eisenhardt, 1989). The cases represent actors which have reasonably homogenous outputs, are operating within the same industry, and share the substantial focus concerning sustainability within the AEC industry. Moreover, the actors are operating within the same institutional field during production. Hence, in addition to enabling replication, we find them appropriate to extend and elucidate potential explanations of our phenomenon (Eisenhardt & Graebner, 2007).

These cases were also chosen to allow for comparisons between them and the elimination of alternative explanations (Eisenhardt & Graebner, 2007). Despite the similarities among the actors, they operate under slightly different conditions in

terms of regulations, laws, and incentives. Public procurement regulations and business model differences are examples of the dissimilarity between the actors. Hence, it allowed us to compare the data collected from the different cases and examine where potential differences may stem from to eliminate alternative explanations.

Lastly, we viewed access to data as a crucial aspect when selecting cases as it increases the likelihood of illuminating our research question (Yin, 2009). We were able to make contact with the leading SOE within the industry early on, giving us access to extensive information regarding the phenomenon. Thereafter, we were introduced to the two private actors through informants with significant industry experience. Thus, we were able to establish contact with representatives within the three cases. Combined with their enthusiasm towards making the industry greener and how far they have come concerning sustainability in general, it allowed us to gain access to a substantial amount of relevant data.

3.3 Presentation of cases

To conduct the case study, three entities were chosen as our cases (Yin, 2015). Thus, the cases are three different companies within the AEC industry, one SOE and two private actors. They are all working towards a greener AEC industry, but despite operating within the same industry and conducting rather similar activities there are some differences between the cases as well. The private companies operate within the commercial market, while the SOE is embedded in the organizational structure of the government. Consequently, some of their differences are in regard to financing, business models, and regulatory restrictions such as procurement related regulations.

The chosen SOE is a building commissioner, developer, and property manager within the AEC industry, and additionally offers construction and property related advice to the Norwegian government. The SOE manages approximately 2300 buildings spread across 53 countries which constitutes about 2,9 million square meters in total. To meet the distinct and specific needs concerning premises and properties for government agencies, they act as project owners to organize, design, and implement construction projects. Moreover, they work systematically towards making the AEC industry more sustainable through implementing changes such as

zero-emission construction sites, utilizing existing buildings to a larger degree rather than creating new buildings, and a considerable focus on circular economy. However, as an SOE, they have to follow guidelines and are given specific priorities by the government.

The second company, hereafter referred to as company P1, is one of the industry leaders in developing and managing energy-efficient buildings. Their portfolio consists of 107 flexible and environmentally friendly properties, constituting approximately 1,6 million square meters of office premises. One of company P1's primary objectives is to contribute to reducing the environmental footprint of the industry, entailing that environmental considerations are an integral part of their strategy. Thus, they have implemented specific solutions concerning areas such as waste handling, building materials, and energy consumption to lower their environmental impact. Moreover, they collaborate closely with their tenants to reach this objective. Tenants who choose environmentally friendly solutions are also incentivized through the potential reduction in occupancy costs over time, which is a predictable result based on lower total energy costs.

Lastly, hereafter referred to as company P2, is a full-service real estate company that primarily focuses on developing and managing sustainable commercial properties. Their portfolio consists of 24 properties, constituting approximately 108 thousand square meters of premises. Company P2 is also dedicated to minimizing their environmental impact through developments, and their objective is to create more sustainable places to both live and work. Thus, they focus on reducing the need for new buildings, increasing the utilization of existing buildings, and doing more rehabilitation. Moreover, the company aims at being environmental pioneers, and one of their primary goals is to accelerate the future of environmentally sustainable construction.

3.4 Data collection

The primary source of data collected to conduct the case study has been interviews, which is viewed as one of the most essential sources of case study data (Yin, 2018). Although qualitative interviews encapsulate both unstructured and semi-structured interviews, we employed a semi-structured approach due to the relatively clear focus of the multiple case study, to ensure cross-case comparability, and because

two researchers conducted the interviews (Bryman & Bell, 2015). Semi-structured interviews resemble a guided conversation and are characterized by being more fluid and flexible in nature (Yin, 2018). Hence, an interview guide including relevant topics and questions was constructed. However, based on the flexibility inductive theory building research entails, adjustments were made during the data collection process (Eisenhardt, 1989). Secondary sources of data were also collected to ensure triangulation, referring to the cross-checking of data between data sources (Bryman & Bell, 2015; Saunders et al., 2009). Through triangulation, findings from case studies are expected to be more accurate and convincing (Yin, 2018). Hence, we collected both public and organizational documents and utilized them as secondary data sources.

3.4.1 Interviews

As semi-structured interviews were our primary source of data, an interview guide with clear topics and potential questions that would be likely to illuminate our research question was developed. However, the objective was still to extract and obtain the interviewees' understanding of the phenomenon, entailing that the interviewee was given freedom concerning how to reply during interviews (Bryman & Bell, 2015; Saunders et al., 2009). Hence, the interview guide was designed to operate on two levels. The questions included had to both satisfy our line of inquiry, while concurrently being open-ended to a degree that facilitated the desired freedom for the interviewee (Yin, 2018). Despite minor adjustments during data collection, the final interview guide contained 23 questions. Firstly, the case study was introduced, followed by a clarification of confidentiality and consent. Followingly, the 23 questions were distributed between three topics, namely background information about the interviewee, institutions within the industry, and contracting approaches (see Appendix 1).

Similar to the sampling of cases, interview objects were also deliberately selected based on the probability of theoretical insight they could provide. A crucial approach to limit bias was to use multiple and highly knowledgeable interviewees who potentially view the phenomenon from various angles (Eisenhardt & Graebner, 2007). Hence, the informants included in our study were primarily selected from within the different cases, but also actors from different organizations. These actors, viewed as experts or highly knowledgeable informants, provided significant

information about the phenomenon and supported the mitigation of bias in the collected data (Eisenhardt & Graebner, 2007). Besides theoretical sampling, a technique similar to snowball sampling was utilized to reach relevant interview objects (Saunders et al., 2009; Yin, 2018). Through querying relevant interviewees about other informants that might provide our study with valuable insight, together with the initial theoretical sampling, the study eventually included a sample of eight interview objects.

Informant	Interview duration	Digitally/Physically	Organizational documents
Informant 1	47:02	Physically	N/A
Informant 2	59:43	Physically	N/A
Informant 3	45:00	Digitally	N/A
Informant 4	62:38	Physically	Environmental management and strategy, contracts
Informant 5	35:02	Digitally	Environmental management
Informant 6	41:27	Physically	Reports and research material
Informant 7	52:36	Digitally	N/A
Informant 8	39:45	Digitally	Research material

Table 1: Interviews.

In total, eight semi-structured interviews were conducted during data collection (Table 1). The interviewees were either directly related to the cases or viewed as highly knowledgeable informants concerning the phenomenon in question, which further limited biases in the collected data (Eisenhardt & Graebner, 2007). Four of the interviews were conducted physically, face-to-face at locations chosen by the interview objects, while the other four had to be conducted digitally. Acknowledging the loss of non-verbal behavior when choosing to conduct interviews digitally, the access it provided to several informants made us choose

the method (Saunders et al., 2009). Moreover, they were all conducted with the use of webcams, and non-verbal behavior was not considered crucial for our research. Several meetings were also held with contacts from the cases and our supervisor, where different themes, data, and the phenomenon itself were discussed. Through these discussions, further background information about the cases and the phenomenon was obtained.

The interviews conducted were also recorded, after receiving consent from every interviewee prior to the interviews. Recording of interviews has been argued to assist researchers in staying focused on the questioning and listening, and simultaneously helps to mitigate the capacity limitations of memory through transcribing the interviews (Bryman & Bell, 2015). Moreover, recording and transcribing the interviews allowed us to use direct quotes and to conduct repeated examinations of the collected data. Although we acknowledge the disadvantages it may bring, such as inhibiting interviewees to speak freely (Bryman & Bell, 2015; Saunders et al., 2009), they were all genuinely interested in the phenomenon and showed an eagerness to provide valuable information.

3.4.2 Documents

To enable triangulation, public and organizational documents were collected as sources of secondary data. Public documents, namely reports, public-relations material, and mission or vision statements that could support the developing understanding of the phenomenon were collected throughout the case study. Moreover, we were given access to several organizational documents, encompassing documents related to environmental management, contracts, environmental reports and strategy. Due to the openness and genuine interest of our contacts within the organizations, the difficulty of obtaining organizational data was less complicated than anticipated (Bryman & Bell, 2015). Hence, the secondary data we gathered from the documents enabled triangulation, allowing us to corroborate statements made by interviewees and ensure that the data gathered was not misinterpreted (Saunders et al., 2009).

3.5 Data analysis

Theory building can be accomplished by using one or more cases to create theoretical constructs and propositions from empirical evidence based on data

gathered from the cases. The research method was chosen due to its emphasis on the rich, real-world context in which the phenomenon is present, and thus provides us with empirical descriptions of different aspects of the phenomenon in question (Eisenhardt & Graebner, 2007). Initially, we developed a relatively broad research question to enable us to build theory and not become overwhelmed by the amount of data, as it provided our research with a focus. However, the initial research question was intentionally viewed as tentative, due to the theory being emergent in the case study (Eisenhardt, 1989).

The inductive process of theory building from cases happens through recursive cycling through the data gathered from the case, emerging theory, and lastly existing theory and literature (Eisenhardt & Graebner, 2007). Prior to analyzing the data, we conducted an exhaustive review of prior literature to gain insight into topics such as sustainability in the AEC industry, institutions, institutional change, and contracting approaches. The knowledge gained through investigating existing literature supported the development of our initial understanding of the AEC industry and the factors that could be influencing the actors to take measures concerning indirect CO₂ emissions. Subsequently, we utilized the review of existing theory and literature as our foundation for developing the interview guide.

Analyzing the data gathered has been argued to be the heart of theory building from cases, while simultaneously being the most difficult part of the process. Hence, we chose the established “Eisenhardt method” to conduct the data analysis (Langley & Abdallah, 2011). Firstly, we began conducting within-case analysis to gain an understanding of what the different cases reflect and identify potential patterns. This was achieved through a systematic categorization of the data collected, namely the transcribed interviews and relevant information from documents, allowing us to interpret and organize the data collected visually. Moreover, it allowed us to identify emerging patterns within the cases and ensured that any preliminary conclusions we made within particular cases were based on the actual data (Eisenhardt, 1989).

Followingly, we used these within-case analysis and categorizations to search for any emerging patterns across the cases, utilizing the comparative nature of the “Eisenhardt method” (Langley & Abdallah, 2011). To limit biases, we viewed the

data in varying ways and continuously discussed potential patterns while they emerged (Eisenhardt, 1989). Lastly, we proceeded with the process of comparing and tracking back and forth between the emerging theory and data. This highly iterative process is typically characterized as being time-consuming, which we experienced as well due to the comprehensive categorization of our data (Bryman & Bell, 2015). However, we repeatedly examined the categorized data together with the emerging patterns, which enabled us to abstract some common constructs across the cases (Langley & Abdallah, 2011). Thus, we were able to identify several institutional factors within the industry influencing the actors to take measures concerning indirect CO₂ emissions. This iteration between the data and constructs is what makes the findings fit closely with the data, which we believe enhances the qualitative rigor (Eisenhardt, 1989).

3.6 Reliability and validity

Reliability and validity are different kinds of measures used to assess the rigor, quality, and wider potential of research. Even though it has been argued that qualitative studies could be evaluated through different measures, such as trustworthiness and authenticity, we choose to focus on reliability and validity in line with the “Eisenhardt method” (Bryman & Bell, 2015; Langley & Abdallah, 2011). Hence, various methodological approaches were applied to enhance both reliability and validity.

3.6.1 Reliability

The primary objective of reliability is to minimize errors and biases in the study (Yin, 2018). To enhance the reliability of our multiple case study, procedures in our research are explained in detail, such as the process of data collection and how the data was analyzed and theoretical insight emerged. Informants were also explicitly informed about their anonymity to ensure freedom concerning how to reply and to facilitate an honest and genuine conversation. Although the opportunity to repeat case studies rarely occurs, it has been argued that such explicit descriptions of procedures increase reliability in qualitative research (Miles & Huberman, 1994; Yin, 2018). Furthermore, referring to what Miles & Huberman (1994) characterize as external reliability, findings were explicitly linked with the data gathered from our study when presented in the ensuing section. Additionally, the data, referred to as evidence by Langley & Abdallah (2011), is plainly and structurally presented

through an informative table (see Appendix 2). To increase the internal reliability, it is important that the researchers agree on what is being observed (Bryman & Bell, 2015; Miles & Huberman, 1994). As the semi-structured interviews were recorded and transcribed, it enabled us to cycle through our data multiple times to either strengthen or change our understanding of it. Moreover, this recursive cycling through the data gathered and individual categorization showed a very high degree of similarity in our interpretations.

3.6.2 Validity

External validity is often referred to as external validity, and an important distinction to make when conducting case studies is between statistical and analytical generalization. The cases are not specific sampling units, and our objective is not to generalize our results through developing an inference about a population based on the empirical data collected. As we want to shed light on the theoretical concept of institutional change, specifically in the AEC industry, the goal is analytical generalization (Yin, 2018). Hence, the questions asked were intentionally concerning operational processes over time. Moreover, to enhance internal validity, we recursively cycled through the data to do pattern matching among emerging constructs and to conduct triangulation (Yin, 2018). This was also done to strive for a closer fit between data and propositions, which has been argued to increase internal validity as well (Bryman & Bell, 2015). Lastly, we used multiple sources of data as evidence for our research. Even though key informants were not able to review a draft of our analysis, they were able to comment on emerging findings subsequent to the interviews. This was done to ensure consistency between our observations and the proposed theoretical propositions (Yin, 2018).

3.7 Ethical considerations

In regard to ethical consideration, we generally wish to uphold the highest standard possible in our work toward this thesis. This has been the case for all work conducted beforehand and during the writing of this paper, and will continue after it is completed. All interview subjects have been thoroughly informed what they are partaking in, and we have gotten the form confirming their consent to participate, share and be cited for our research purposes signed by all concerned parties. Signatures include both students working on the thesis paper, our supervisor and the interviewees themselves. The consent form was molded from a template

given from the Norwegian center for research data [NSD] during our application process to conduct a scientific study. The application process was also concluded in its entirety before we began conducting interviews. Data storage and anonymity have been formalized through the application sent to NSD, and all data, details, personalia and otherwise sensitive information is stored securely, and is coded so that we ensure no unauthorized individuals may gain access to them.

CHAPTER 4: Findings and Analysis

In this section of the thesis, we present our empirical findings, and intend to do so through a categorical presentation of each element we have found to be important to our research question: *Which institutional factors influence actors to take measures concerning indirect CO₂ emissions in the AEC industry?* We begin with a presentation of industry facts gathered from expert and informant interviews and a comparison of SOEs and private enterprises in the industry. Thereafter, we present the various identified factors that either enable or constrain the actors to take measures concerning indirect CO₂ emissions, being *financing, laws and regulations* and *norms*. Lastly, findings related to how the contractual relations in the AEC industry affect the actors' ability to implement environmentally friendly solutions is presented. Hence, the presented findings intend to directly address the three sub-questions identified, which collectively helps us investigate our research question in a structured manner.

The industry is set up for short-term profits. That is what is so detrimental to the whole structure [in regard to ownership of the whole process].

Short-term profits drive an industry that is based on long-term investments. (Informant 1)

4.1 How do institutionalized practices differ between SOEs and private firms?

In terms of industry-specific institutions, the Norwegian AEC industry has a few, and the most pressing will be presented here. These institutions are a combination of what we have learned through expert interviews with industry specialists, literature and informants. The following are the institutional logics and trademarks we have found to be the most relevant to our problem statement. We also use this

point under the analysis to draw comparisons between the SOE and the private firms.

Case processing and the general amount of time used on bureaucratic activities widely differ in SOEs and private enterprises in the Norwegian AEC industry, as in most other cases. Like most other SOEs, moving items of interest forward can be anything from relatively rapid to glacial, compared to private firms usually being faster in getting things done, as illustrated in an expert statement:

We see the private sector getting ahead due to the public sector not being able to take it in, [the requirements for change] and there is too much inertia en masse to stay ahead. [The SOE] has been the frontrunner for many years, but governmental policies and conditions are too strict and inhibit transformation. They (SOE) have no room to play around and experiment like [P1] has done to create a foundation with room for risk taking. (Informant 1)

From our expert interviews, it quickly became apparent that the Norwegian AEC industry is no different from the usual suspects. Private firms and enterprises are to a large extent free to operate as they please and report to their owners, keep their stakeholders' interests in mind, and seek to stay as profitable as possible. The SOE on the other hand has stricter budgets due to the operational structures these enterprises are embedded in. They also report back not only to their parent organization, the Ministry of Local Government and Regional Development, but also need to keep their spending in check according to the financials provided by the national Ministry of Finance (Government of Norway, n.d.). Furthermore, SOEs will, according to law and as specified by an informant later, have to place all job offers to subcontractors on public procurement bids, where certain standards of operations have to be met for potential service providers and professionals.

Finally, and arguably the largest difference is that private firms tend to raise a structure, then own it for a determined amount of time, and thus gain passive income by either operating the facilities on site, getting paid rental revenue from the businesses that rent the spaces, or both. The building will oftentimes end up being sold after some years, or if seen as beneficial, be kept for further rental activities.

Conversely, an SOE will usually get an assignment from another state-owned client, and will raise the building then for it to be delivered to the client once finished, terminating further involvement of the SOE, as pronounced here:

(...) but it has to be commercial, as opposed to [the SOE] which builds in relation to certain public functions. They exist, they have a defined need, but to a much larger extent build based on assigned commissions. They are allocated public funds that are budget dependent. (Informant 2)

The industry as a whole largely operates by the same laws and regulations, albeit with minor differences. The core product the SOE and private firms provide are deceptively similar until further scrutiny is applied. This we examine further in the upcoming section of the analysis.

4.1.1 Long-term profitability

We discussed briefly how the different actors planned to continue profitability in the long-term, while also keeping their focus on sustainability.

We operate the buildings ourselves, and live off rental income. This means that we benefit from high-quality construction in our projects. Many other real estate investors develop, build, then sell. As such, they are preoccupied with the value at the moment the building is completed, and if they have a sufficient life cycle economy, operations and rent, they will not have to worry, because they will sell the building, find a new plot and build again. The transactions become more financially oriented, so you make a living from these. We rely to a higher extent on rent and operational activities. These are two different business models. We are served with building in high quality, as the investment yields returns through proper operating of the buildings. (Informant 2)

As is described, the private firms enjoy profits in terms of rent to a higher extent than the SOE, which barely rents out their spaces, as most is delivered directly to the user of the building. Furthermore, certain buildings will, according to some contracts, be up for procurement for the user after a set amount of time spent as tenants.

4.1.2 Ownership

In a similar vein, another factor found to impact the incentives an organization has to develop more energy-efficient construction methods was ownership. Several interviewees mentioned stronger incentives towards choosing sustainable solutions for buildings when the benefits it entails are beneficial for themselves, rather than the customer or the society as a whole. As mentioned by one of our interviewees:

But it can also be easier to cut back on the sustainability requirements than much else in projects, as many of the sustainability goals within projects yield results that are on a societal level and not the building itself. It probably feels easier as it does not affect the building itself, which is what actually is to be delivered to the customer. It makes sense that one has a larger incentive to not do so if you are going to operate the building. (...) We have also experienced this ourselves, that it is more difficult to get through with solutions that result in energy-efficient buildings when we are not going to operate the building. (Informant 5)

A recurring topic relevant to ownership is moving away from the property itself being the main attraction for users, but rather providing services as the prominent feature of the structure.

I believe the fact that the project owner continues to stay further in the value chain and offers the built area as a function and not the specific square meter is important. That is actually what is being done more and more in the industry, that the business model moves from product and more towards a service, entailing that one takes on more ownership and also the risks related to operational costs. (Informant 1).

Creating services for the user of the building in tandem with actually raising the structure seems to create a much higher degree of ownership to the process as a whole. In doing so, the project owner seemingly becomes far more aware of not only the materials they use in the process, but also how to incorporate smart solutions for the building itself.

When we say that our properties are built in clusters in large urban hubs, this works well with having an environmentally geared strategy, but also through having eight properties next to each other. When these buildings are operated one can do this more efficiently than if we have one building here and one building there. This also allows for urban development in an area where your customers are offered more when you control larger parts of the environment. (Informant 2)

The project owner seems to take the construction project much more to heart when the ownership is extended, as they will no longer be responsible only for each individual square meter, but also the building's functions. While this is a rather drastic extension of the project owner's scope compared to more traditional building, [P1] has utilized this method and found that it allows for more value creation, and synergistic effects are reached.

We operate a customer center that acts as a command post for operations. When we own the whole flora of technical facilities based on what the previous contractors have procured, connecting everything is not necessarily simple. Recently, we have made contracts with service providers that state "these are the control systems we need, this type of automation, and this type of access control in the system". We need these to be aligned for us to be able to remotely control and operate the domains well. (Informant 2)

Another benefit of increasing the degree of ownership is the fact that procurement needs to be more thought out, methodical and intentional. In order for the project owner to be able to connect all of the systems for centralized command, they are dependent on the systems being uniform across the board and inhibiting the ability to communicate together. This way they can reduce cost through scale-dependent contracts and allow the providers to more rapidly develop their technical solutions, which may lead to better sustainability efforts.

4.2 How do institutional factors enable or constrain the reduction of indirect CO₂ emissions?

During our interviews, we identified some mediating and moderating institutional elements that we aptly deem as enabling and constraining factors. The most pressing are as follows: *financing, laws and regulations, and norms*. These four factors describe the most important institutional factors that enable or constraints the reduction of indirect CO₂ emissions in the AEC industry. Incentives are relatively similar between SOEs and private firms, but the processes related to the incentives differ. We have further broken down incentives into long-term profitability and ownership.

4.2.1 Financing

In terms of financing, the private sector enjoys financing directly from commercial banks, providing loans and credit primarily based on the firms' financials. In recent times however, the banks have begun to offer much more beneficial conditions based not only on a firm's accounts, but also on their ability to provide more environmentally sustainable construction.

Today, we are at the point where our buildings are primarily green, which means we get cheaper financing. (Informant 2)

Green loans from financial institutions are an important incentive the industry has been met with during the last few years, which set stricter requirements for the climate and environmental circumstances, but in return yields more beneficial conditions. (Informant 3)

The bank providing better terms for financing through green loans pushes the private sector toward operating above the minimum requirements in order for the terms to become even better, further reducing the cost environmental targets have. This notion also connects to long-term profits, as loans in the industry tend to not only be long-term loans, but also the fact that properties built on green foundations may be far more desirable for tenants in the future.

You need to be ahead if you want to transition to green energy and get beneficial financing. Another point is that buildings you raise today will be

easier to rent out in ten years if you are marginally ahead of the curve when the structure was built, as it will still be modern. (Informant 2)

While this method of green financing is extremely beneficial for firms in the private sector, it is not an option for the SOE, as they are dependent on very different financial conditions, as specified by an informant representing the SOE.

We are subject to financial regulations [from the Ministry of Finance], so missing the mark is not really an option. A private party is subject to different financial regulations, allowing for them to test different things with bigger risk and bigger possible yields. We are unable to speculate in terms of profits. (Informant 4)

You usually hear all the time that private firms would be interested in making sure that the capital goes to concrete objectives, that they are not willing to take risks due to owners needing to get their returns, and so on. While in practice, it might be different. It might be important for the government to run a really strict financial governance model, so that becomes the primary and the essential, and it might overshadow other solutions in project development. (Informant 5)

The Ministry of Finance largely controls all allocation of funds for construction purposes, so the SOE has little to no freedom in experimenting or exploring, as the cost-related focus is far stricter than if commercial banks would be responsible for the financing. One of the methods the SOE may use to influence their budgets is through consulting, albeit on the cost-effectiveness:

“In new construction projects, cost-efficient realizations of societal and effect targets stand central. [SOE] is to provide advice for cost-effective solutions.” (quote from Sustainable, cost-effective and coordinated building and property management document). As you can see, there is substantial focus on cost-effectiveness throughout. (Informant 4)

The fact of the matter here seems to be that the SOE lacks the ability to take the risks necessary for testing radical methods, as cost-effectiveness is the priority. The

Ministry of Finance's risk aversion thus seems to become a rather pressing barrier for the public sector in the construction scene to make a meaningful change in a short amount of time, mainly due to the institutionalized method of attaining funds.

I believe the institutional aspect you mention is very important here, and the Ministry of Finance becomes one of the largest barriers for [the SOE], due to profits being the center of focus. (...) It is all about the inertia [of SOEs]. What we are seeing specifically, is that the large shareholders are required to report on the [EU] taxonomy. The finance industry and markets are the facilitators of this change, while the Ministry of Finance are not subject to the same requirements. [In the latter,] there is no connection between CO₂ emissions and economy, but in commercial markets, there is to a much larger degree. (Informant 1)

As the expert states, the finance industry, not the government, is the architect behind this shift, and the Ministry of Finance does not force the same requirements on their beneficiaries so long as the efforts yield in net positives.

4.2.2 Laws and regulations

The AEC industry is heavily regulated by governmental bodies, and continues to be updated every year with new technologies and better, more environmentally friendly ways of creating materials and erecting buildings (BNL, n.d.).

If you want to satisfy technical construction regulations today, you need to take into account that they are made with regards to the product quality of newer materials. For example, there are certain conditions for the insulation capacity of a window. These regulations are made with regards to how windows produced today are, so windows made five years ago are insufficient. They are unsatisfactory and do not isolate enough, and you are unable to reuse them. In the same vein, concrete needs to be C-branded, an agreement all European commodity production needs to adhere to, not only in construction. (Informant 2)

The industry is characterized by standards of operations, often set by governmental entities to ensure a certain level of progress in terms of development and innovation.

This is both in regards to development of industry standards and norms, but also the highly needed declination of CO₂ emissions. Among the driving forces behind the institutional changes in the Norwegian AEC industry is Standard Norge, an NGO working to provide the industry with new standards of measurement for various metrics. An example is Norsk Standard 3720 (NS3720), a new standard for measurement of CO₂ emissions for new buildings (Standard Norge, 2018). Other examples lie in the quality of the materials used in new buildings, such as that the concrete elements and equipment used for the foundations of new buildings have to be C-labeled. This C-labeling however, stands as an example that raising the bar to better the materials itself is not necessarily the only way of reducing emissions.

The concrete taken from [project redacted for anonymity] was produced before C-branding was even invented. (...) Because of this we have applied for heaps of dispensations from laws and regulations to be allowed to reuse [the concrete materials]. For the dimension relating to reuse [of old materials] and the circular economy, laws and regulations need to be updated to allow for stimulation, and avoid stagnation and barriers.

(Informant 2)

The informant in this case did receive the necessary dispensations to conclude the largely recycled building, but it demanded an array of time-consuming and bureaucratic activities related to procurement. Firms are incentivized to use better and more environmentally friendly materials by governmental bodies, by outlawing the use of materials and equipment not meeting a selected standard. Comparatively, another informant commented on the regulations concerning the recycling of old and out-of-date construction materials.

There exists a lack of facilitation for reuse of materials and resources, which further complicates the process of finding sufficient materials to use in new projects. (Informant 3)

We figured it out while working on the [project redacted for anonymity]. You are able to accomplish a lot if you search. We used our entire network, we even searched through Finn.no looking for used materials.

You cannot really do that under normal circumstances. Today, a whole value chain for used materials is missing. (Informant 2)

The informants from the private sector here describe the lack of facilitation for using recycled materials, and furthermore, an in-practice example of having to sift through Finn.no, a primarily consumer-used platform for thrift wares and other pre-owned goods in order to find used materials. As such, there lacks clear incentives for adopting the use of recycled and reused materials, but even more pressing are the regulations that prohibit the use of them. The project the informant mentions above represents one of very few, if any other, exceptions to the rule. This may however indicate that the lawmakers are willing to allow for more of this same practice given the positive environmental results yielded by the construction project. The SOE has other regulations to adhere to.

We can also risk being sued or accused of procuring wrongly. For example, if we observe someone doing something remarkable we are not allowed to directly ask for the same thing, as we have to go through a public procurement process. In doing so, we also have to know that more than one organization is able to deliver on what is being asked for so that it enables competition. We are not allowed to go directly to a contractor specialized within reuse that recently did or made something clever, and simply ask for the same thing. (Informant 4)

As is apparent, even if a value chain for used materials were to exist, the SOE would in all likelihood have a more difficult time capitalizing on it, as they adhere not only to the financial regulations from the Ministry of Finance, but are also bound by public procurement processes. As such, laws constrain the entire industry, including both main sectors, albeit for different reasons.

4.2.3 Norms

Norms in the industry could be seen as best practices, and are related to how the industry operates on a daily basis, or their *modus operandi*. Being a very mature industry, many of the practices its actors' conduct and the activities they perform seem to be deeply rooted and institutionalized to a high degree, and have been

largely transnationally focused for a very long time. These notions are confirmed both by informants from the private firms, the SOE and an expert.

If we want the buildings we wish for, we have to move towards being more specific regarding what kind of solutions we want than what one traditionally has done before. All of the products that have been implemented into a building have traditionally been the products which the contractors have received the best price on during purchasing.
(Informant 2)

It does not have to be some barriers however, it might simply be that we are not trained or have enough experience with trying new things. We do perform activities primarily the way we have always done them.
(Informant 4)

Traditionally, we do things the same way every single time. Due to time and cost being important factors, we keep going with the same traditional models. (Informant 1)

A combination of best-price focus and lack of training and adaptive capabilities seems to be the most apparent reason for the status quo to remain relatively stagnant. As an informant stated previously, inertia and sluggish bureaucratic activities may also be among the reasons for this. Interestingly, only one informant neglects costs as an explaining factor as to why the status quo exists as is.

4.3 How does contractual relations affect the actors' ability to implement more environmentally friendly solutions?

The overall trend of our findings concerning contractual relations in the AEC industry shows that a more relational contracting approach can positively affect actors' ability to implement more environmentally friendly solutions. On the other hand, it is also evident that the transactional nature of the traditional contracting approach has the opposite effect.

4.3.1 Traditional and transactional contracting

I think that we focus too much on them. They have become a barrier in the industry. The contractual approach is also so traditional and old.

(Informant 1)

Concerning the contractual arrangements within the industry, it is evident from our data that the traditional contracting approach contains some factors that negatively affects the actors' ability to implement more environmentally friendly solutions. As clearly stated by one of our interviewees, they have become a barrier in the industry. Specifically, traditional contracting was found to reduce innovativeness among contractors within the industry, stemming from the lack of clear incentives.

It is difficult for me to imagine that someone would deliver something of higher quality than what we demand [using DB]. It might also be a bit difficult to come up with proposals, recommendations or suggest improvements that would result in higher performance concerning sustainability targets. (Informant 4)

Hence, as the contractors within the industry are neither incentivized nor rewarded for being innovative and proposing solutions that go beyond the minimum requirements set by the project owner, it appears that the contractual approach reduces the ability to implement solutions that can result in the reduction of indirect CO₂ emissions. Moreover, several interviewees acknowledged that there was an inherent issue concerning opportunism within the industry. The absence of incentives to collaborate and work towards common goals was a recurrent topic and was to some extent found to be rooted in the contractual approaches.

The industry is set up in a way such that every actor optimizes for themselves, entailing that one loses the ability to optimize for the whole project which would profit the building and the society as a whole.

(Informant 5)

There is also a lack of incentives for collaboration in the traditional [contracting] models, and if there is any collaboration it is primarily to

reduce costs and extract the largest margin possible within one activity.

(Informant 6)

In sum, the traditional contracting approaches utilized in DB and DBB project delivery methods constrain the actors' ability to implement environmentally friendly solutions within the AEC industry. The constraining factors identified are primarily the lack of clear incentives to foster innovation, collaboration, and how it has given rise to opportunism.

4.3.2 Non-traditional and relational contracting

Although it is predominantly the traditional contracting approaches that are being utilized among actors within the industry, all of the interviewees expressed the benefits and desire of a higher degree of collaboration. As relational contracting entails more collaboration, it has the potential of fostering innovative solutions and rewarding contractors more appropriately when proposing them. As noted by one of our informants:

A contractor that wants to deliver a solution that includes sustainability aspects well above what we ask for, on their own accord, would probably have an easier time suggesting and getting their solution priced correctly with a more relational contracting approach. In a DB, the contractor would have to do this on their own, and by that also take the full cost and risk, as they are only subject to minimum requirements by us [depending on the project]. (Informant 4)

On the other hand, it is important to note that more relational approaches are utilized as well, such as different forms of partnering. Its collaborative nature was found to give project owners the ability to make better use of the contractors' knowledge during designing and allow for better risk distribution between parties. Additionally, the need for more flexibility and collective incentives to facilitate the implementation of environmentally friendly solutions was acknowledged clearly by two of the interviewees:

We are moving more and more towards partnering which regulates and distributes risks better, facilitates efficiency, but also places the right

competence where it is needed. Incentives related to productivity, efficiency, and quality are going to be included as well. Joint responsibility, more flexibility, and collective incentives are needed. (Informant 2)

We do wish for some contracting approaches which stimulate the delivery of solutions above our minimum requirements. (...) We would need some incentives in our contracts that would make it attractive to provide solutions above these minimum requirements. As long as flexibility is combined with clear minimum requirements, incorporating more flexibility might be beneficial to achieve this. (Informant 5)

However, it is evident from our data that it is mostly Partnering to DB that is being employed, to some extent explaining the sustained need for collective incentives offered by relational approaches. Thus, actors have been able to work around the Standard contracts by including aspects of relational contracting, but the inability to see through that the sustainable solutions are being implemented is viewed as an inhibiting factor.

When we have found the best candidate [for a general contractor in a DB] we use between two to six months on a collaborating period, were we in collaboration optimize the project so that we can control that our preferred [sustainability-focused] solutions are chosen whether the contractor had thought of the same solutions or not to assure that the result is satisfactory. (Informant 2)

One must set (sustainability) requirements in all of the contracting approaches, but you need to follow up on them. I think that could be one of our most prominent barriers. (Informant 4)

Yet, the traditional contractual approaches appear to have become institutionalized to a large extent in the industry. The actors are tightly coupled, which makes changing the well-established contractual relations between them more difficult.

The whole construction industry is like this, overly governed by contractual relations. I do believe that it is the transactions and contracts that control the industry. (Informant 1)

The project delivery methods and [traditional] contracting approaches are well-established and recognized in the construction industry. It is a comprehensive job to make major changes in these. (Informant 3)

Thus, related to making the industry more sustainable, it was found that the contractual relations among the tightly coupled actors within the industry decrease the rate of progress. The difficulty of changing these was acknowledged by several of our informants. However, it was suggested that the innovations made when working with and around the existing Standard contracts supported the incremental change of them.

The Standard contracts have not been central in how we execute and work during projects. We have been able to develop a working methodology, collaboration method and processes, but they are also dependent on the [traditional] contracting approach. (...) The innovations made affect and support the incremental changes made to the Standard contracts rather than shifting them out in one go. (Informant 2)

In essence, there is an apparent need for a more relational contracting approach to drive the implementation of environmentally friendly solutions. The data shows that this mainly stems from the need for more collaboration, flexibility, collective incentives, and common goals. However, the contractual approaches currently employed are deeply rooted within the industry, resulting in an inability to make major changes rapidly.

4.4 Summary of findings

In sum, it is apparent from our findings that the necessity of long-term profitability for private firms incentivizes the implementation of more sustainable solutions in their value creation. Similarly, as the private firms operated most of their buildings as well, choosing environmentally friendly solutions that would result in lower operational costs in the future became more attractive. Moreover, several

institutionalized factors were identified as enabling or constraining the reduction of indirect CO₂ emissions. Although private firms are being incentivized to perform on a higher level concerning sustainability to receive green loans, laws and regulations in general are not sufficiently facilitating institutional change within the AEC industry. Moreover, institutionalized norms were found to constrain the process of change as well, as best practices have become deeply rooted among the tightly coupled actors. Lastly, due to the transactional nature of the traditional contracting approach generally employed in the AEC industry, the lack of collaboration and incentives to drive innovation negatively affects the actors' ability to implement more environmentally friendly solutions. As a response to this, it was evident from our findings that a more relational approach would be beneficial to aid this process of institutional change.

CHAPTER 5: Discussion

In this chapter of the paper, we intend to shed light on our findings through the relevant literature formerly identified. Hence, we will discuss which institutional factors influence actors to take measures concerning indirect CO₂ emissions in the AEC industry, structured through the use of the three sub-questions derived from our research question (see figure 4).

Based on the upcoming discussion, we have developed a model representing a simplified version of the real world. The boxes on the right represent constraining factors for attaining change, and the left represent enablers. The curved arrows at the top and bottom represent that the constraints and enablers are indeed connected to one another, meaning that an element in the enabler box may have been made an enabler as a response to a constraint. The Venn diagram in the middle represents the industry as a whole, but the SOE has its own constraints which differ slightly from the private firms' conditions. Contracting is the only factor that is not directly related to either the SOE or private firms alone, and we view the traditional models as constraints and the non-traditional models as enablers. Together, they represent the entire industry, and the model is designed to present all constraining and enabling factors to change, particular to their respective segments of the industry (see Figure 5).

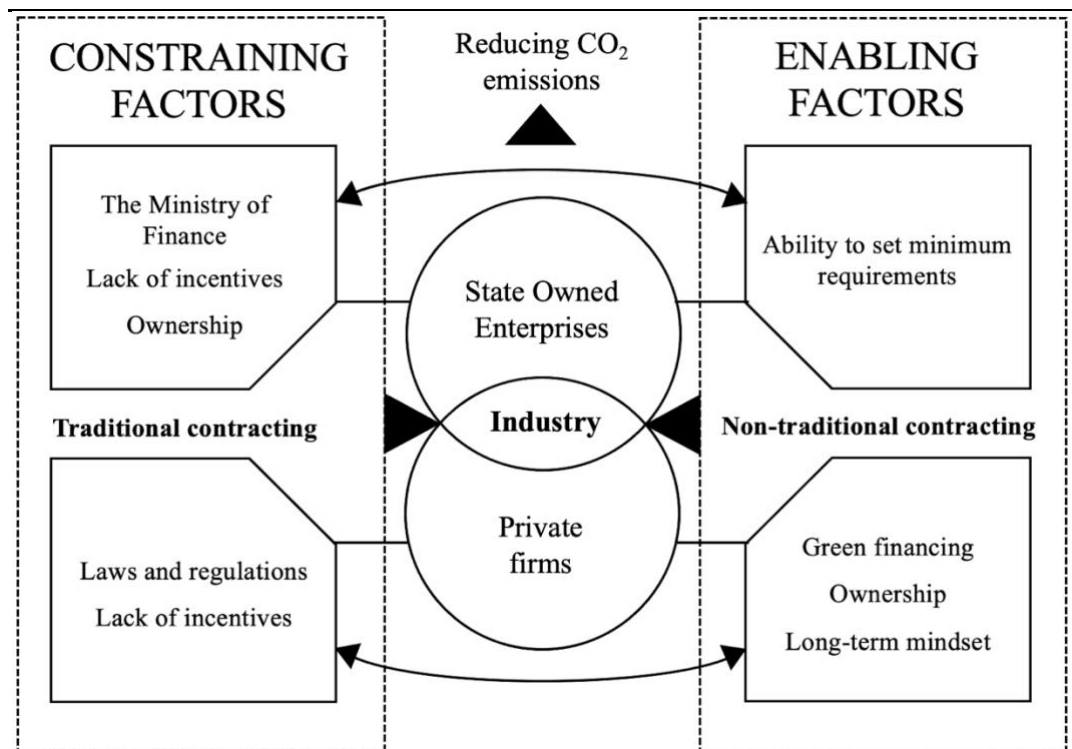


Figure 5: Constraining and enabling factors for the reduction of indirect CO₂ emissions in the Norwegian AEC industry. Source: Own analysis.

Due to institutional change in the AEC industry being our phenomenon, it is predominantly the institutional theory of the firm that is being discussed in the following section. The theory generally describes organizations as systems of norms, structures, and routines. These institutions can be used to describe both the current and future behavior of an industry and the firms within it (Scott, 2013). Hence, the institutions such as norms and common practices are elements that affect how firms run and can shape entire industries. Previous literature acknowledges the difficulties of changing the ways of operating and structures created within industries. Furthermore, representations of structures within the institutionalized fields come in the shape of three pillars: The Regulative Pillar, the Normative Pillar and the Cultural-Cognitive Pillar (Scott, 2013). As the aforementioned elements become institutionalized over long periods of time, making changes to them develops into a complicated process as well (Scott et al., 2011). According to Micelotta et al. (2017), the three triggers that can support this change, namely exogenous changes, institutional entrepreneurship and improvement in micro-processes and practices, may take several years to implement. This notion is also supported by Scott (2008), Thornton (2004) and Dacin and colleagues (2002), supporting that exogenous and endogenous changes

are key to institutional field change. Although some propositions are presented, the theoretical implications of the study are presented throughout the discussion.

5.1 How do institutionalized practices differ between SOEs and private firms?

The most prominent differences identified between SOEs and private firms are their organizational structure and business model. Even though public procurement regulations were identified as a dissimilarity as well, it is covered in the discussion related to laws and regulations. Our findings reveal an intricate organizational structure for the SOE, reporting and answering to multiple ministries with diverse goals. However, private firms generally have more flexibility in the way they operate and conduct their business in the commercial market. Thus, decisions and projects are primarily driven by profitability and not dependent on the assigned commissions given to you.

Concerning these diverse goals, the need to develop and implement more uniform sustainability goals was stated by several informants. From the literature, it is evident that the creation of more uniform goals is useful for creating institutional change, as facing multiple contradictory institutional logics has been argued to be among the greatest challenges in achieving institutional change (Greenwood et al., 2011). These institutional logics are generally described as beliefs, values, symbols or practices which have become institutionalized within a field (Thornton & Ocasio, 2008; Winch & Maytorena-Sanchez, 2020). Moreover, as the institutionalized field is exhibiting more than one institutional logic, it can be referred to as having institutional complexity (Greenwood et al., 2011; Winch & Maytorena-Sanchez, 2020).

Lastly, their business models are rather unlike. While it was found that the SOE builds mostly based on assigned commissions for various public functions, the private firms build, rent out and operate their buildings. Relying on their own buildings for rental income entails other incentives to choose environmentally friendly solutions, as one stays further in the value chain. As evident from our findings, the increased dependence on long-term profitability and ownership of the building generates different incentives for the private firms. Interestingly, informants stated that this mainly stemmed from their customers and their demands.

As argued by Mazza & Pedersen (2008), and Micelotta and colleagues (2017) exogenous shocks can fundamentally change how business is conducted. Becoming a common logic, the institutional pressure has the potential of changing the institutional field (Scott, 2008). This became apparent in our findings, as informants observed a shift in customer demand related to the desire for more environmentally friendly offices. The actors' anticipate that this institutional pressure will progress, and are thus incentivized to stay proactive concerning their tenants' demands contrasting to the SOEs. Although some of the statements were related to energy-efficient buildings, this would also result in the reduction of indirect CO₂ emissions.

5.2 How do institutional factors enable or constrain the reduction of indirect CO₂ emissions?

As has been established in our literature review, attaining change in an institutional field may take years to achieve, and often happen due to outside forces or incremental innovations or changes in local practices.

5.2.1 Financing

When banks decide to change the requirements for granting financing, many related fields are expected to change as well, as they will need to adapt to a change directly relating to their operations. Hence, when the providers of equity are able to grant more beneficial loans it may act as an exogenous change in the institutional environment that may further lead to changes in legitimacy-granting criteria and deinstitutionalization (Micelotta et al., 2017). While the banks' decision to change their requirements and support firms that operate in more environmentally friendly ways is an exogenous change, the actions a firm will need to take in order for them to attain beneficial financing could be categorized as a trigger in micro processes and practices. A combination of exogenous and endogenous changes thus happens and the field's legitimacy granting criteria are changed, as the bank forces its borrowers to think differently.

However, financing is both an enabling *and* constraining factor for the industry, depending on where in the industry one is situated. For the private firms, the bank's green loans act as enablers, as discussed above, but for the SOE financing is a different story. Due to the financing for the SOE being provided by the Ministry of Finance, the SOE has no access to the same beneficial financing the private firms

operate with. The Ministry of Finance is more rigid in its criteria and focuses primarily on investments yielding monetary returns. As such, the Ministry of Finance is not able to incentivize the SOE with the same benefits the private firms get, and unless the Ministry of Finance is willing to change its acceptance of yields other than monetary, they will remain a constraining factor for the SOE. The Ministry of Finance clearly provides the SOE with financing and the ability to perform their main tasks, so calling them strictly a constraint for the SOE is somewhat naive. The main issue lies in the lack of rewarding those that take environmental considerations to heart and work to lower their emissions.

Proposition 2a: The private firms' beneficial financing from the banks allows them to use the reduction of emissions as an incentive for economic gain.

Proposition 2b: The Ministry of Finance acts as a constraining factor for the SOE due to them not differentiating between capital granted based on the reduction of indirect emissions.

5.2.2 Laws and regulations

The Regulative pillar as described by Scott (2013) contains all laws and regulations relevant to an institutional field and is highly applicable to discuss. Our evidence suggests that laws and regulations are constraints for both the SOE and the private firms, but the private firms suffer the most from these, owing to the fact that they already seem to have better measures for actual sustainability practices in place than that of which the SOE operates with. Through institutionalization and enabling a value chain dedicated to the recycling of used materials for construction, one could create the circular economy the industry sorely needs. Financing and risk aversion are much larger inhibitors for the SOE, making the laws and regulations prohibiting the use of old materials less of a pressing obstacle for the SOE, simply by virtue of them not being incentivized to recycle to the same degree as the private firms. The regulations that do constrain the SOE are the laws regarding public procurement processes. These regulations make it difficult for the SOE to capitalize fully on who they choose to work with, as they primarily select partners based on best price. If the SOE sees a sustainable solution they want to use, they are unable to simply buy it, as they have to request it in the public space, according to law. The Ministry of Finance also acts as a legislative body that we established as a constraint for the

SOE, compared to the private firms. On the other end, however, the SOE sees a large enabling factor in the regulative sphere as well. According to informants, the SOE is by far the largest player in the industry to set minimum requirements for the rest of the firms to follow. As such, they have a lot of power and responsibility to affect how the industry operates.

The private firms, on the other hand, gain access to vastly superior financing and freedom to choose whomever they would like as their subcontractors, not to mention the fact that old and recycled materials are sold cheaper than new materials. One informant stated that they had gotten concessions from the laws that prohibit the use of materials that have been recycled due to the lack of certain production qualities. During this project, the enterprise was allowed to use concrete elements that lacked C-branding, windows that were older than five years, and other materials that did not meet the required regulatory standards. This project did not only cost less than other projects, but they ended up with extensive environmental savings as a result of the usage of recycled materials. After the project had been completed, politicians (among which were the Minister of Local Government and Regional Development) were allegedly very eager to understand the processes behind how the project succeeded, to then look into changing regulations to allow for further environmental development through the use of such projects. This goes to show that the industry actors need to be able to use different methods of construction, and that the regulations intended to conserve the environment could be detrimental to the very purpose they are intended for. In this case, institutional logics clash (Greenwood et al., 2011), and the pilot project conducted by the informant's organization proved to aid in the debunking of said logic. Furthermore, the project, being free from certain regulations, acted as a bounded space free from many of the institutions the AEC industry would normally face, aiding the development of the industry, and further solidifying Winch and Maytorena-Sanchez's (2020) research suggesting that pilots and projects could lead to sustained change. These changes could be described as institutional entrepreneurship, or a disruptive strategy derived from the mobilization of unused resources, leading to changes in institutional fields and logics, and the institutionalization of new practices (Micelotta et al., 2017). As such, laws and regulations act primarily as constraints for both SOEs and private firms, albeit for different reasons. The current laws and regulations need to incentivize reduction of CO₂ emissions to an extent that opens up for long-term

gains for the actors. Hence, the industry would benefit from a domain where project owners may get exemptions from certain regulations and standards in order for institutional entrepreneurship to happen.

Proposition 2c: Laws and regulations act primarily as constraints for SOEs and private firms seeking to reduce indirect CO₂ emissions.

Proposition 2d: The SOE largely controls how regulations and laws are adopted for setting minimum requirements in the industry and set the bar for most industry actors, making certain laws and regulations an enabling dimension.

5.2.3 Norms

Norms are an important facet of institutional theory, and goes under both the Normative Pillar and the Cultural-cognitive pillar, culture (Scott, 2013). The Normative pillar explains how norms come to be as a result of how actors believe the world to exist, and a common meaning of how things should be done. This may result in norms cementing and becoming ingrained in the culture of the field one is operating. As such, norms may become ingrained to an extent where they turn almost subconscious, turning it into culture. Hence, we see the two pillars overlapping in this case. In the AEC industry, we identified some norms relating to CO₂ emissions, particularly in regard to their best practice and routines.

The industry informants generally describe an environment where they have become so used to doing things the way they prefer that finding new solutions have become increasingly difficult. Furthermore, they keep to the same traditional contractual approaches due to time, cost, and the ease of using existing and familiar approaches. The industry seems to have optimized to an extent where trying new methods is not cost-efficient enough to warrant it. Particularly in the case of the SOE, where the Ministry of Finance grants equity based on prospected returns, testing of new methods seems to be associated with too much risk. Moreover, the traditional contracting approaches are still being used to a far higher degree than that of the non-traditional approaches. Holding on to the tried and tested methods may also be a legitimacy-granting criteria in the industry, as doing things the old way could be a symptom of the traditional approaches granting validity. Worth mentioning is also the repeated sentiment of contractors locally optimizing their

operations, but not striving to cooperate to collectively optimize for environmental sustainability.

According to Micelotta and colleagues (2017), exogenous changes in institutional environments are among the triggers that may form new legitimacy-granting criteria which finally lead to the disappearance or change of practices. Both the SOE and the private firms recognize the need for better performance concerning emissions, and both parties seem to agree that the industry needs to advance. Hence, there seems to be a mismatch between institutional logics (which supports change for the better) and actual practices. Improvisations in micro-processes and practices (Micelotta et al., 2017) are another trigger that leads to changes in institutional logics, so it seems as if the industry is past the latter point, yet has not reached the point where the practices are adapted to the newfound logics. As they are still to a large extent using the traditional contracting approaches over the non-traditional ones their practice needs to change in accordance with the common logics. This could mean endogenous changes would need to take place, as there may be few discrepancies between macro systems and micro activities. As to why, the phenomenon could be explained by the industry facing increasing regulations and demand to adapt, and as they optimize to meet these criteria, the effect of meeting new standards and methods could end up negligible (Scott, 2008; Thornton, 2004).

Proposition 2e: The industry suffers from inertia as a result of what is believed to be best-practice and low degrees of meaningful endogenous changes.

Proposition 2f: The industry suffers from inertia due to local optimizations and low efforts to cooperate.

5.3 How does contractual relations affect the actors' ability to implement more environmentally friendly solutions?

Our findings indicate that the contractual approaches utilized within the industry are not deemed as a primary concern for the implementation of environmentally friendly solutions. However, it is evident that several factors rooted in the transactional nature of the traditional contracting approach in the AEC industry are affecting the actors. Although actors have been able to work around the contractual

approaches and implement several environmentally friendly solutions, our research suggests that they constrain their ability to do so.

Within the AEC industry, projects involving multiple parties are utilized to a high degree (Lædre, 2006; Manning, 2017). Due to the fragmented nature of the AEC industry where several parties are required to complete a product or service, and the extensive use of inter-organizational work and collaboration, institutionalized shared understandings and rules for collaboration are formed (Bresnen et al., 2004; Jones & Lichtenstein, 2008). As identified through our study, the traditional contracting approach used within the industry has become highly institutionalized. Referring to DB and DBB, it was evident from our findings that the contractual arrangements have become a barrier in the industry, and that making considerable changes to these and the traditional contracting approaches would be a comprehensive process. However, informants argued that incremental changes were being made to the Standard contracts, primarily affected by innovative activities conducted by actors within the industry. Such incremental changes to processes can collectively lead to changes in institutional logics (Bouty et al., 2019; Mintzberg & Waters, 1985). Hence, our findings imply that the traditional contractual approaches within the industry have become institutionalized, in addition to being changed incrementally.

Proposition 3a: The traditional contractual approaches within the industry have become institutionalized to a degree that constrains actors' ability to implement environmentally friendly solutions.

Proposition 3b: Incremental changes are being made to the traditional contractual approaches based on innovative activities conducted by actors within the industry.

5.3.1 Traditional and non-traditional contracting

Transactional contracting is characterized as being rigid, as an attempt is made to provide for all possible contingencies. There are clear lines between being and not being in a transaction, and the overall emphasis is on formal documents and legal rules. Any communication should be concerning the contents of the transaction, entailing low levels of social exchange (Macneil, 1977; Williamson, 1979). On the

other hand, relational contracting acknowledges that inter-organizational transactions are embedded in social relationships (Ng et al., 2013). Thus, it is based on the recognition of the mutual benefits a more cooperative relationship can give rise to and involves more extensive communication and personal involvement. Moreover, both benefits and burdens are shared between the parties involved in the transaction (Macneil, 1994; Rahman & Kumaraswamy, 2002). Within the AEC industry, the traditional contracting approaches found in DBB and DB can be viewed as rather transactional based on the degree of focus on collaboration among the contracting parties (Bygballe et al., 2019; Lædre, 2006). The transactional nature of the traditional contracting approaches within the industry was further supported by several informants.

Yet, several scholars have argued for the use of relational contracting within the AEC industry. In essence, it has been proposed that relational contracting would be more appropriate due to the industry being characterized as being fragmented, complex, and highly specialized. Additionally, the contracts are usually viewed as evolving as the underlying circumstances may change over time during projects (Colledge, 2005; Rahman & Kumaraswamy, 2002, 2004). Transactional contracting has also been tied to the difficulties of maximizing value in construction projects. Matthews & Howell (2005) argues that this primarily stems from the contractual structure, and how it inhibits innovation, cooperation, and coordination. Consistent with the above sentiment, our findings suggest that the traditional contracting approaches utilized do not incentivize contractors to collaborate. Additionally, explicitly stated by one of our informants, contractors are not incentivized to bring forward innovative and environmentally friendly solutions when using DB.

It is evident from our findings that the lack of incentives to collaborate and common goals were viewed as prominent factors affecting the actors' ability to implement more environmentally friendly solutions. This absence has seemingly fostered opportunism to some extent, where every actor focuses on optimizing for themselves and are paying less attention to the project as a whole. Consistent with previous literature, contractors are predominantly focusing on maximizing their individual profit (Ghassemi & Becerik-Gerber, 2011; Matthews & Howell, 2005). Moreover, according to Fischer et al. (2017), transactional contracting encourages

competition rather than cooperation, mainly due to the misalignment of incentives between the parties. Supported by our findings, the lack of incentives to collaborate and the absence of collective incentives and common goals offered by the traditional contracting approach constrains actors' ability to implement environmentally friendly solutions. Moreover, several informants argued that a contractual approach that fosters this to a larger extent would be beneficial. We therefore propose that:

Proposition 3c: The transactional nature of the traditional contracting approach constrains the actors' ability to implement more environmentally friendly solutions due to the lack of clear incentives to foster innovation and collaboration, and the opportunism it has given rise to.

Proposition 3d: Relational contracting can enable the actors' ability to implement more environmentally friendly solutions due to its focus on collaboration, flexibility, and collective incentives.

5.4 Practical implications

Based on the analysis, we do not necessarily view the green transition in the AEC industry as reaching a summit or vaulting over a high pole, but rather as a continuous process that moves on a continuum, along an axis, that can be accelerated or decelerated depending on its subjected stimuli and the strength of its peripheral institutional enabling and constraining factors. If the pace of innovative endeavors in the industry is to keep up with the increasing need for more sustainable construction, laws and regulations need to continually be updated to avoid them becoming barriers to change and innovation. In more concrete terms, we suggest the facilitation of a business model that makes it possible to become profitable on recycled materials, as this would lift a significant barrier from the industry. If some facilitation for a circular economy value chain with recycled materials at its core could be applied to the industry, it may lead to changes in legitimacy-granting criteria such as institutional entrepreneurship, leading to the deinstitutionalization of one practice, and institutionalization of another. This would fit well into Micelotta and colleagues' (2017) framework of resource mobilization. Furthermore, the SOE and private firms being subject to such different factors for attaining change make the needs of the industry more incoherent and disjointed,

meaning that the SOE, which has a substantial influential force, will find different problems as opposed to those that private firms may find. This means that if the two sectors saw the exact same challenges, they would likely be able to cooperate to a higher degree and push for change more rapidly. Facilitation of a new business model enabling a circular economy concerning recycled materials could also have the potential to lift parts of the rigorous financial governance that rule the SOE due to the reduction in prices of reused materials.

CHAPTER 6: Conclusion

The aim of our thesis was to examine which institutional factors influence actors to take measures concerning indirect CO₂ emissions in the AEC industry. Our propositions suggest that the most pressing institutional factors that influence the actors are differences in their business models, financing, laws and regulations, norms and contractual approaches. Additionally, certain institutions affect SOEs more than private firms, and vice versa. Ultimately, the SOE faces more constraining factors and fewer enabling factors than the private firms do. This is simply by virtue of the SOE being subject to other regulations and laws than that of the private firm, providing less freedom to experiment and take risks for the SOE. The private firms on the other hand, can act more proactively due to their business model being more tailored around it. Ingrained norms in the industry make it more difficult to try innovative and novel methods of operations, and combined with a preference of traditional contractual models, collectively changing the modus operandi of the industry is restrained by inertia. Our research also extends the understanding of how transactional contracting leads to lower levels of collaboration, viewed as an integral part of achieving change in an institutional field. As expressed by Lima and colleagues (2021), more research on operation and maintenance in the industry is needed, as opposed to the planning stages. As such, we see our contribution to the body of research as not only relevant, but also somewhat novel, as we have shed light onto important insight regarding value creation during the maintenance stage. Conclusively, the AEC industry shows a collective willingness to change and reduce CO₂ emissions, even suggesting that it is needed, but bureaucratic processes and restrictive norms make the process slow.

6.1 Limitations and future research

We acknowledge that it would have been beneficial to increase our sample size and include additional interview objects further down the value chain. Due to the amount of data that needed to be analyzed and the difficulty of reaching informants with relevant knowledge concerning our study, only three cases were chosen. Including additional interview objects from each case could possibly improve the depth of our findings (Saunders et al., 2009). Moreover, we were not able to include other informants or firms in the value chain. Especially related to the contractual relations in the industry, we view the lack of informants from other parts of the value chain as something that should be recognized (Miles & Huberman, 1994). Lastly, to the best of our knowledge, few scholars have studied institutional change in the AEC industry. Although measures were taken to reduce the possibility of misinterpretations of our findings, we acknowledge the possibility of reinterpretations by other scholars.

For future research, we recommend scholars examine the institutional factors we have found, and seek to understand how a constraining factor may be cut off, and how enabling factors can be accelerated so the field as a whole may adopt change. Furthermore, confirmation of the identified factors and relationships need also be in place before any future examination could be applied. Because Norway stands as a beacon for other nations to follow in terms of environmental development within the construction sphere, it is an increasingly important industry to examine, as the novel solutions provided by the actors in the domestic industry could be further developed to become accessible enough for less financially adept countries to apply (Friends of Gothenburg Innovation, 2021; The Explorer, 2021). Sustainability could in and of itself be seen as a legitimacy-granting criteria, which accentuates the importance of exploring it, particularly in an industry as pollutive as the AEC industry. Lastly, we propose that future research collect and analyze data from more cases to allow for comparisons to a greater extent. As our sample includes actors performing well regarding the implementation of environmentally friendly solutions, it may be beneficial for further research to investigate the constraining factors for actors with worse performance regarding environmental sustainability. Moreover, the inclusion of informants in other parts of the value chain could result in a better understanding of institutional change in the industry. Specifically, we encourage the inclusion of general contractors, subcontractors, or project leaders.

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Appendices

Appendix 1: Interview guide

Takk for at du har sagt ja til å delta på dette intervjuet i forbindelse med vår masteroppgave ved Handelshøyskolen BI. All data innsamlet vil bli lagret og behandlet i henhold til samtykkeerklæringens retningslinjer, samt alle andre gjeldende regelverk for datahåndtering. All innsamlet data vil bli slettet i sin helhet når forskningen er ferdig, informasjonen vi mottar vil aldri deles med urettmessige, og alt er sikkert lagret.

Når du blir stilt spørsmål i dette intervjuet ønsker vi at du tilstreber å gi så informerte og tydelige svar som mulig. Intervjuet er tiltenkt til å vare ca. 60 minutter. Dette betyr at du er forventet å ta i snitt 2-3 minutter til å svare på hvert spørsmål, slik at vi kan forsikre oss om at hvert intervju før og/eller etter dette er så like hverandre som mulig.

Har du noen spørsmål før vi starter?

Introduksjon av oss og studien

- Presentere oss og bakgrunnen for studien
- Forklare hva vi er ute etter å undersøke
- Informere om samtykkeerklæringen, konfidensialitet, og innspillingen av intervjuet

Bakgrunnsinformasjon om intervjuobjektet

1. Kan du fortelle litt om din stilling, hvor lenge du har jobbet i organisasjonen, og hva jobben din går ut på?
2. Har du tidligere hatt noen andre stillinger innenfor BAE-næringen?
3. Hva slags prosjekt har du deltatt i?

Strategi og institusjoner

4. Hva er deres visjon når det kommer til nybygg og bransjens fremtid?
 - Hvordan planlegger dere å etterleve denne visjonen?
5. Hvilke insentiver har dere blitt møtt med for å ta et større ansvar med tanke på miljø?

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6. Hva er de største barrierene for å oppnå endring omkring klimagassutslipp?
 7. Hvordan har dere tatt hensyn til EU Green Deal og ESG og implementert dette inn i deres strukturer?
 8. Hvordan rapporteres bærekraft fra tidligfase til bygget står?
 - Hvordan ser prosessen for rapportering ut?
 9. Hvilke krav stiller dere til deres underleverandører og kontraherte arbeidere?
 - Spesifikt med fokus på klimagassutslipp?
 10. Hva slags oppfølgingsarbeid gjennomfører dere etter at leveransen av bygg er ferdig og bruker har tatt bygget i bruk?
 11. Hvordan kontrollerer dere at kravene dere stiller til underleverandører følges opp og stemmer?
 - Hvordan kontrollerer dere at jobben er gjennomført riktig?
 - Hvordan kontrollerer dere at bygningen leveres uten feil?
 12. Hvordan stiller dere dere til risiko og usikkerhet omkring kostnader?
 - Er dere villige til å akseptere høyere risiko som kompromiss for noe annet?
 - Hvilke instrumenter benyttes for å motvirke kostnadsrelatert risiko?
 13. Hva er det som avgjør om dere har klart å nå bærekraftsmålene dere har satt for et prosjekt? Hvordan måles miljøtiltak og klimagassutslipp?
 14. Hvordan utfordrer dere status quo i BAE-næringen?
 15. Hvordan jobber dere med læring og erfaringsoverføring fra prosjekt til prosjekt?
 16. Hvilke endringer tror du må til i dagens forretningsmodeller for å fasilitere en reduksjon av klimagassutslippet i bransjen?

Kontrakter

17. Tror du kontraktsformene brukt i BAE-næringen påvirker miljøaspektet i bransjen?
 - Hvis ja/nei: På hvilke måter/hvorfor ikke?
18. Tror du at de tradisjonelle kontraktsformene som benyttes i dag kan utbedres på noen måte?
 - Hvis ja/nei: Hvordan?/Hvorfor ikke?

- Hvis ja: Hva står i veien for at dere får utbedret disse direkte?
19. Tror du insentivene brukt i kontraktene har en påvirkning på miljøaspektet i bransjen?
20. Tror du den kontraktbaserte risikofordelingen har en påvirkning på miljøaspektet i bransjen?
21. I hvor stor grad benyttes følgende kontraktmodeller hos dere?
- Utførelsesentreprise
 - Totalentreprise
 - Samspillsentreprise
22. Benytter dere dere av effektorienterte kontraksrelasjoner, i.e. kombinasjonen av tjeneste og produkt når dere heiser bygg?
23. Hvor viktig tror du OPS-kontrakter er for å komme nærmere det grønne skiftet i næringen?

Appendix 2: Data presentation – Quotes

How do institutionalized practices differ between SOEs and private firms?		
Topic	Quote	Informant
General	We see the private sector getting ahead due to the public sector not being able to take it in, [the requirements for change] and there is too much inertia en masse to stay ahead. [The SOE] has been the frontrunner for many years, but governmental policies and conditions are too strict and inhibit transformation. They (SOE) have no room to play around and experiment like [P1] has done to create a foundation with room for risk taking.	Informant 1
General	(...) but it has to be commercial, as opposed to [the SOE] which builds in relation to certain public functions. They exist, they have a	Informant 2

	<p>defined need, but to a much larger extent build based on assigned commissions. They are allocated public funds that are budget dependent.</p>	
<p>Long-term profitability</p>	<p>We operate the buildings ourselves, and live off rental income. This means that we benefit from high-quality construction in our projects. Many other real estate investors develop, build, then sell. As such, they are preoccupied with the value at the moment the building is completed, and if they have a sufficient life cycle economy, operations and rent, they will not have to worry, because they will sell the building, find a new plot and build again. The transactions become more financially oriented, so you make a living from these. We rely to a higher extent on rent and operational activities. These are two different business models. We are served with building in high quality, as the investment yields returns through proper operating of the buildings.</p>	<p>Informant 2</p>
<p>Ownership</p>	<p>But it can also be easier to cut back on the sustainability requirements than much else in projects, as many of the sustainability goals within projects yield results that are on a societal level and not the building itself. It probably feels easier as it does not affect the building itself, which is what actually is to be delivered to the customer. It makes sense that one has a larger incentive to not do so if you are going to operate the building. (...) We have also experienced this ourselves, that it is more</p>	<p>Informant 5</p>

	difficult to get through with solutions that result in energy efficient buildings when we are not going to operate the building.	
Ownership	I believe the fact that the project owner continues to stay further in the value chain and offer the built area as a function and not the specific square meter is important. That is actually what is being done more and more in the industry, that the business model moves from product and more towards a service, entailing that one takes on more ownership and also the risks related to operational costs.	Informant 1
Ownership	When we say that our properties are built in clusters in large urban hubs, this works well with having an environmentally geared strategy, but also through having eight properties next to each other. When these buildings are operated one can do this more efficiently than if we have one building here and one building there. This also allows for urban development in an area where your customers are offered more when you control larger parts of the environment.	Informant 2
Ownership	We operate a customer center that acts as a command post for operations. When we own the whole flora of technical facilities based on what the previous contractors have procured, connecting everything is not necessarily simple. Recently, we have made contracts with service providers that state “these are the control systems we need, this type of automation, and this type of access control in the system”. We	Informant 2

	need these to be aligned for us to be able to remotely control and operate the domains well.	
How do institutional factors enable or constrain the reduction of indirect CO₂ emissions?		
Factor	Quote	Informant
Financing	Today, we are at the point where our buildings are primarily green, which means we get cheaper financing.	Informant 2
Financing	Green loans from financial institutions are an important incentive the industry has been met with during the last few years, which set stricter requirements for the climate and environmental circumstances, but in return yields more beneficial conditions.	Informant 3
Financing	You need to be ahead if you want to transition to green energy and get beneficial financing. Another point is that buildings you raise today will be easier to rent out in ten years if you are marginally ahead of the curve when the structure was built, as it will still be modern.	Informant 2
Financing	We are subject to financial regulations [from the Ministry of Finance], so missing the mark is not really an option. A private party is subject to different financial regulations, allowing for them to test different things with bigger risk and bigger possible yields. We are unable to speculate in terms of profits.	Informant 4
Financing	You usually hear all the time that private firms would be interested in making sure that the	Informant 5

	<p>capital goes to concrete objectives, that they are not willing to take risks due to owners needing to get their returns, and so on. While in practice, it might be different. It might be important for the government to run a really strict financial governance model, so that becomes the primary and the essential, and it might overshadow other solutions in project development.</p>	
Financing	<p>“In new construction projects, cost efficient realizations of societal and effect targets stand central. [SOE] is to provide advice for cost effective solutions.” (quote from Sustainable, cost-effective and coordinated building and property management document). As you can see, there is substantial focus on cost effectiveness throughout.</p>	Informant 4
Financing	<p>I believe the institutional aspect you mention is very important here, and the Ministry of Finance becomes one of the largest barriers for [the SOE], due to profits being the center of focus. (...) It is all about the inertia [of SOEs]. What we are seeing specifically, is that the large shareholders are required to report on the [EU] taxonomy. The finance industry and markets are the facilitators of this change, while the Ministry of Finance are not subject to the same requirements. [In the latter,] there is no connection between CO₂ emissions and economy, but in commercial markets, there is to a much larger degree.</p>	Informant 1
Law and regulations		Informant 2

	<p>If you want to satisfy technical construction regulations today, you need to take into account that they are made with regards to the product quality of newer materials. For example, there are certain conditions for the insulation capacity of a window. These regulations are made with regards to how windows produced today are, so windows made five years ago are insufficient. They are unsatisfactory and do not isolate enough, and you are unable to reuse them. In the same vein, concrete needs to be CE-branded, an agreement all European commodity production needs to adhere to, not only in construction.</p>	
<p>Law and regulations</p>	<p>The concrete taken from [project redacted for anonymity] was produced before CE-branding was even invented. (...) Because of this we have applied for heaps of dispensations from laws and regulations to be allowed to reuse [the concrete materials]. For the dimension relating to reuse [of old materials] and the circular economy, laws and regulations need to be updated to allow for stimulation, and avoid stagnation and barriers.</p>	<p>Informant 2</p>
<p>Law and regulations</p>	<p>There exists a lack of facilitation for reuse of materials and resources, which further complicates the process of finding sufficient materials to use in new projects.</p>	<p>Informant 3</p>
<p>Law and regulations</p>	<p>We figured it out while working on the [project redacted for anonymity]. You are able to accomplish a lot if you search. We used our</p>	<p>Informant 2</p>

	<p>entire network, we even searched through Finn.no looking for used materials. You cannot really do that under normal circumstances. Today, a whole value chain for used materials is missing.</p>	
Law and regulations	<p>We can also risk being sued or accused of procuring wrongly. For example, if we observe someone doing something remarkable we are not allowed to directly ask for the same thing, as we have to go through a public procurement process. In doing so, we also have to know that more than one organization is able to deliver on what is being asked for so that it enables competition. We are not allowed to go directly to a contractor specialized within reuse that recently did or made something clever, and simply ask for the same thing.</p>	Informant 4
Norms	<p>If we want the buildings we wish for, we have to move towards being more specific regarding what kind of solutions we want than what one traditionally has done before. All of the products that have been implemented into a building have traditionally been the products which the contractors have received the best price on during purchasing.</p>	Informant 2
Norms	<p>It does not have to be some barriers however, it might simply be that we are not trained or have enough experience with trying new things. We do perform activities primarily the way we have always done them.</p>	Informant 4
Norms		Informant 1

	Traditionally, we do things the same way every single time. Due to time and cost being important factors, we keep going with the same traditional models.	
How does contractual relations affect the actors' ability to implement more environmentally friendly solutions?		
Traditional and transactional contracting	I think that we focus too much on them. They have become a barrier in the industry. The contractual approach is also so traditional and old.	Informant 1
	It is difficult for me to imagine that someone would deliver something of higher quality than what we demand [using DB]. It might also be a bit difficult to come up with proposals, recommendations or suggest improvements that would result in higher performance concerning sustainability targets.	Informant 4
	The industry is set up in a way such that every actor optimizes for themselves, entailing that one loses the ability to optimize for the whole project which would profit the building and the society as a whole.	Informant 5
	There is also a lack of incentives for collaboration in the traditional [contracting] models, and if there is any collaboration it is primarily to reduce costs and extract the largest margin possible within one activity.	Informant 6

<p>Non-traditional and relational contracting</p>	<p>A contractor that wants to deliver a solution that includes sustainability aspects well above what we ask for, on their own accord, would probably have an easier time suggesting and getting their solution priced correctly with a more relational contracting approach. In a DB, the contractor would have to do this on their own, and by that also take the full cost and risk, as they are only subject to minimum requirements by us [depending on the project].</p>	<p>Informant 4</p>
	<p>We are moving more and more towards partnering which regulates and distributes risks better, facilitates efficiency, but also places the right competence where it is needed. Incentives related to productivity, efficiency, and quality are going to be included as well. Joint responsibility, more flexibility, and collective incentives are needed.</p>	<p>Informant 2</p>
	<p>We do wish for some contracting approaches which stimulate the delivery of solutions above our minimum requirements. (...) We would need some incentives in our contracts that would make it attractive to provide solutions above these minimum requirements. As long as flexibility is combined with clear minimum requirements, incorporating more flexibility might be beneficial to achieve this.</p>	<p>Informant 5</p>
	<p>When we have found the best candidate [for a general contractor in a DB] we use between two to six months on a collaborating period, were</p>	<p>Informant 2</p>

	we in collaboration optimize the project so that we can control that our preferred [sustainability focused] solutions are chosen whether the contractor had thought of the same solutions or not to assure that the result is satisfactory.	
	One must set (sustainability) requirements in all of the contracting approaches, but you need to follow up on them. I think that could be one of our most prominent barriers.	Informant 4
	The whole construction industry is like this, overly governed by contractual relations. I do believe that it is the transactions and contracts that control the industry.	Informant 1
	The project delivery methods and [traditional] contracting approaches are well established and recognized in the construction industry. It is a comprehensive job to make major changes in these.	Informant 3
	The Standard contracts have not been central in how we execute and work during projects. We have been able to develop a working methodology, collaboration method and processes, but they are also dependent on the [traditional] contracting approach. (...) The innovations made affect and support the incremental changes made to the Standard contracts rather than shifting them out in one go.	Informant 2
General		Informant 1

	<p>The industry is set up for short-term profits. That is what is so detrimental to the whole structure [in regard to ownership of the whole process]. Short-term profits drive an industry that is based on long-term investments.</p>	
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