



**CHALMERS**  
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# **An Exploration of The Economic Impact and Project Process Influence of BREEAM Certification on Commercial Properties**

Master's Thesis in Design and Construction Project Management

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CHALMERS UNIVERSITY OF TECHNOLOGY  
Gothenburg, Sweden 2023  
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Report No. E2023:146

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## ABSTRACT

The growing emphasis on environmental responsibility has prompted industries, including commercial real estate, to reassess their standards and practices. This transformation has led to sustainable properties gaining prominence in this evolving landscape, particularly in Sweden, where certifications have become an industry norm and integral to construction projects. However, these implementations of environmental certificates such as the Building Research Establishment Environmental Assessment Method (BREEAM), have led to various challenges for the project leaders in the construction process, impacting both finances and processes. Acknowledging this shift, this study therefore delves into the economic impact of BREEAM certification on commercial properties, including investigating the economic value of commercial properties, as well as exploring the potential increase in economic value from BREEAM. Moreover, the report also discusses the challenges associated with the certification process, including increased complexity and additional work, but also management strategies to manage the implementation. This was enabled through an inductive approach and a qualitative research strategy, including semi-structured interviews with key stakeholders on a large construction company which delves deeper into one of their projects. This study in the Swedish context implied that contrary to previous literature, BREEAM certification's economic benefits, such as price and rental premiums are minimal, emphasizing the predominant influence of external drivers and highlighting administrative and hidden costs as primary contributors to the overall cost of BREEAM certification on commercial properties. It was further identified that the implementation of BREEAM certification in commercial office building construction significantly increases workload and complexity, demanding early planning, effective management strategies, and leveraging the experience of project stakeholders, underscoring the importance of addressing the complexity for successful project performance.

Keywords: Green investments, Environmental certifications, BREEAM certification, Commercial properties, AEC sector, Green properties, Sustainable Properties, Real Estate, Property



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## Acknowledgements

We want to express our gratitude to Petra Bosch-Sijtsema, our supervisor at Chalmers University of Technology, for the consistent feedback and support provided during our Master's thesis. In addition, a big thank you to our supervisor at the studied company and the entire team involved in the investigated case, whose valuable data and insights have significantly enriched our work. Furthermore, we extend our sincere appreciation to all the individuals who generously participated in the interviews conducted for our Master's thesis.

Göteborg, January 2024



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## 1. Introduction

The growing global emphasis on environmental accountability and sustainability has caused various industries to reevaluate their standards and practices. In the field of commercial real estate, the concept of sustainable or green properties is rapidly gaining prominence. Leskinen et al. (2020) succinctly define sustainable properties as “properties that are certified by well-known and internationally widely adopted green certificates” (p. 2), capturing a crucial element of this evolving landscape.

Given that buildings are estimated to be responsible for a substantial 40% of energy consumption and 36% of greenhouse gas emissions within the European Union, the emergence of sustainable buildings initially responded to a heightened demand for energy and resource efficiency (World Green Building Council, 2013). The discourse within commercial real estate has been significantly shaped by sustainability certification systems, purposefully developed, and designed to advance sustainable construction practices and serve as a catalyst for transformative change. The World Green Building Council (2013) designates BREEAM as one of today's premier certification systems globally. This certification system evolved into a standard and a benchmark for evaluating and certifying the environmental performance of buildings.

In the contemporary landscape, the concept of green buildings has matured into a broader spectrum, embracing a more holistic approach (World Green Building Council, 2013). This approach emphasizes the “triple bottom line” of sustainability somewhat shifting the focus from “planet” towards the people and profit aspects. “The Business Case of Green Buildings,” presented by the World Green Building Council (2013), compellingly argues that sustainable buildings represent more than just an environmental endeavour; they also make compelling business sense. Although the beneficial effects of energy-efficient new construction and retrofitting are recognized, stakeholders frequently lack a clear comprehension of the economic impact of the certification system and how it contributes to the overall value (Schweber, 2013). In the financial-centric background of project management, where budget, time, and scope constraints hold importance, the incorporation of the BREEAM assessment process into design and construction phases is an unavoidable reality for today's contractors (Phung et al., 2023). Nevertheless, a research gap exists concerning the complexity and additional workload associated with the implementation of sustainability certification systems. It therefore motivates an investigation into how the project process is influenced together with effective management strategies to manage the implementation.

Therefore, this study seeks to address this gap by delving into the multifaceted aspects of sustainable building practices, with a particular focus on the BREEAM certification system. By investigating the influence of the BREEAM certification system on the economic value of commercial properties and scrutinizing how the implementation of this certification system influences the project process, the research aims to shed light on the intricate relationship between sustainable building practices, economic outcomes, and the construction process. Through this exploration, the study aims to contribute valuable insights to the evolving discourse on sustainable construction within the commercial real estate domain.

### 1.1 Aim of the study

This report aims to investigate the influence of the BREEAM certification system on the economic value of commercial properties, as well as explore the potential increase in economic value that can result from certifying properties according to BREEAM and other certification systems. A comprehensive examination of the economic value that is actively generated throughout the process of satisfying the certification criteria is conducted. Lastly, an analysis to assess the impact of implementing the certification system on the project process, analyzing aspects such as heightened complexity and additional work is investigated. In addition to this, an examination of strategies that can be employed to effectively oversee the implementation is being conducted.

To attain our stated aim, the study is based on a large construction company in Sweden and delves deeper into one of their projects where they develop a commercial office building in the outskirts of Gothenburg. In pursuit of and achieving the overarching goal and addressing the study's aim in this master's thesis, the following research questions have been established:

*RQ1: What is the economic impact of BREEAM certification on commercial properties from a developer's perspective and how does it contribute to their overall value?*

*RQ2: How does the implementation of the BREEAM certification system affect the project process, including its complexity and additional work, and what strategies can be employed to manage its implementation, in the construction of a commercial office building?*

### 1.2 Delimitations

Certain deliberate choices have been made to narrow down the focus of this study, known as delimitations. Firstly, the study focuses primarily on the perspective of the developer in the construction and real estate industry and delves deeper into one of their development projects. This approach aims to provide a more in-depth understanding of the research area. In addition, the study intentionally centers on the Swedish market and specifically examines an office building project in Sweden, effectively setting a geographic boundary for the research context. Moreover, although this study primarily concentrates on the analysis of sustainability certification with a focus on BREEAM, it recognizes and references other sustainability certifications and certification systems. This acknowledgment is made necessary due to the limited availability of certain resources regarding BREEAM. Lastly, a delimitation of this study is that it exclusively focuses on the economic aspect of sustainability and does not encompass the environmental and social dimensions of sustainability. These delimitations serve to clarify the research's primary areas of concentration and emphasis.

### 1.3 Structure of the report

Firstly, Chapter 2 provides the theoretical foundation, delving into the background literature in an area of inquiry, acting as the equivalent of theory. Subsequently, Chapter 3 outlines the methodology employed in this Master's thesis. Chapter 4 presents the results of the empirical study, summarizing the key findings from the conducted interviews. Thereafter, Chapter 5 includes a discussion that aligns the main findings from the results with the theoretical framework. Lastly, Chapter 6 concludes the report by summarizing the key insights gained from the study and highlighting future potential research.

## 2. Theoretical framework

The following chapter presents a comprehensive theoretical framework as the conceptual backbone of this research, offering an in-depth exploration of BREEAM as an environmental certification system, delving into its certification process and standardization. Additionally, a deepening into the key economic consideration for implementing green building certification systems in commercial properties involves the economic impacts of green building certification systems, drivers and benefits of certified green buildings, and the cost of certified green buildings. Lastly, previous research regarding the impact of green building certification systems on the project process is also presented, including the concept of visibility, complexity and additional work, and motivating cost premium.

### 2.1 BREEAM

In today's context, buildings have a substantial environmental footprint, both during their construction and throughout their lifespan (Sweden Green Building Council, 2017). This has led to the creation of diverse certification systems with the aim of fostering more sustainable construction practices. With the assistance of environmental certification and their well-defined framework, the pursuit of environmentally sustainable buildings become more straightforward. Environmental certification involves a third-party assessment to ensure that the quality of the work performed, and the environmental performance of the building is based on various indicators depending on which certification system is used. Environmental certification is not a government requirement but rather a privately administered certification process. In Sweden, there are several recognized environmental certification systems, including among others LEED, Miljöbyggnad, Well, NollCO2, GreenBuilding, and BREEAM (Sweden Green Building Council, 2017). These certification systems exhibit variations in multiple aspects, encompassing their emphasis, criteria, and methodologies. Nonetheless, their collective goal is to advance and promote the sustainability aspects of buildings through the implementation of environmental certification schemes.

In this context, the focus of the study is on BREEAM, an environmental certification system that originated in the United Kingdom and has been in existence since 1990 (Sweden Green Building Council, 2017). It is seen as the first green building rating system in the world, and it is widely accepted that all later major green rating systems are under the influence of BREEAM (Doan et al., 2017). Currently, the environmental certification system is the most widely adopted in Europe with 80% of the European market share for sustainable buildings and has been utilized for over 500,000 buildings worldwide. It is an international standard that is locally adapted, operated and applied through a network of international operators, assessors, and industry professionals (Sweden Green Building Council, 2017). BREEAM-SE was introduced by the non-profit organization, Sweden Green Building Council in 2013, which developed a Swedish version of BREEAM, aiming to cost-effectively and robustly mitigate the environmental life cycle impacts of new buildings. BREEAM-SE has mainly been adopted for commercial properties and Swedish conditions, enabling certification in alignment with Swedish regulations and standards. BREEAM-SE is used to certify newly produced buildings and the current version, BREEAM-SE v6.0, was released in January 2023. There is no Swedish version for existing buildings, and instead, Sweden Green Building Council (SGBC) refers to the international certification system BREEAM In-Use which is developed and administered by the Building Research Establishment (BRE). It possesses the same grade levels, but BREEAM-SE should be used for newly produced buildings since it includes methods and practices that can be integrated into the procurement and project process, thus providing a more holistic view of sustainability impact and improvements.

#### 2.1.1 The certification process of BREEAM-SE

BREEAM-SE offers five rating levels, ranging from Pass to Outstanding, and each is associated with a specific percentage score (Sweden Green Building Council, 2017). The project's design



team decides which tradable credits to pursue based on their desired rating level and project-specific prerequisites. These BREEAM-SE rating benchmarks facilitate comparisons among buildings of the same type, enabling stakeholders to assess a building's sustainability performance relative to others in its category.

<b><i>BREEAM-SE Rating</i></b>	<b><i>Score (%)</i></b>
<b><i>Outstanding</i></b>	$\geq 85$
<b><i>Excellent</i></b>	$\geq 70$
<b><i>Very good</i></b>	$\geq 55$
<b><i>Good</i></b>	$\geq 45$
<b><i>Pass</i></b>	$\geq 30$
<b><i>Unclassified</i></b>	$< 30$

*Table 1. Rating benchmark for BREEAM-SE*

The certification process for BREEAM-SE consists of different categories and requirements (Sweden Green Building Council, 2017). First of all, BREEAM-SE has some minimum requirements for each rating level that must be satisfied, and these prerequisites are designed to ensure that performance is not overlooked for fundamental environmental criteria, such as management, energy, water, and waste management, in order to prevent neglecting performance in the pursuit of a specific rating.

When these minimum standards are achieved, there are also tradable credits, which are optional, that become available depending on which particular BREEAM rating level the project wants to reach (Sweden Green Building Council, 2017). This means that non-compliance in one area can be offset by compliance in another. For these credits, an environmental weighting system is used to rank the relative environmental impact of the different categories. The BREEAM-SE environmental weighting is an explicit weighting system and is based on a combination of both consensus-driven weightings and expert panel ranking (Sweden Green Building Council, 2017). This weighting plays a crucial role in the building's environmental assessment and offers a way to precisely define and rank the impact of environmental issues. The table below displays the section weightings for various environmental criteria in the BREEAM-SE assessment for non-residential buildings. Determination of focus in BREEAM-SE involves collaborative decision-making among stakeholders, including the client, design team, principal contractor, BREEAM-SE Assessor as well as other disciplines. This collaboration is crucial for achieving the desired performance level and providing project information (evidence) at the end of the project. This collaborative effort extends to tailoring the environmental weighting system based on the scope of the project (i.e. shell only, shell and core, fully fitted, etc.)

There are nine different environmental categories or sections included in all BREEAM schemes which together respond to a total of 57 individual assessment issues, which address environmental aspects to consider within the categories (see Table 2). For each issue, several available credits can be achieved. For example, the environmental category "Pollution" consists of 5 different individual assessment issues which together offer 12 credits. The studied project is weighted by the project type non-residential and fully fitted out.

Lastly, the design team can earn innovation credits that reward projects with innovative sustainable practices, offering a potential maximum of 10 extra credits (10% of the Final score) (Sweden Green Building Council, 2017). The purpose is to reward buildings that go beyond best practices to achieve sustainability benefits or performance levels that are not currently recognized by standard BREEAM-SE assessment issues and criteria. Innovation credits can be achieved by either meeting exemplary performance criteria defined within the existing BREEAM-SE issue or making an application to SGBC for a particularly innovative design feature, building technology, etc.

<b><i>Environmental section</i></b>	<b><i>Weighting Non-residential Fully fitted out</i></b>
<b><i>Management</i></b>	11.00%
<b><i>Health and wellbeing</i></b>	17.00%
<b><i>Energy</i></b>	18.00%
<b><i>Transport</i></b>	7.00%
<b><i>Water</i></b>	4.00%
<b><i>Materials</i></b>	17.00%
<b><i>Waste</i></b>	8.00%
<b><i>Land use and ecology</i></b>	10.00%
<b><i>Pollution</i></b>	8.00%
<b><i>Total</i></b>	100.00%
<b><i>Innovation</i></b>	10.00%

*Table 2. BREEAM-SE section weighting for non-residential buildings*

In the context of the construction of new buildings, the new version of BREEAM-SE is customized to align with the climate change mitigation and adaptation criteria outlined in the EU taxonomy's annex (Sweden Green Building Council, 2017). The EU taxonomy aims to enhance the ability of investors to make informed strategic investment decisions, as well as contribute to transparency in the sustainable investment market (Sweden Green Building Council, 2017). Regardless of the rating, BREEAM-SE can be used to align, and show compliance with the taxonomy requirements. SGBC provides a table that gives an overview of which BREEAM-SE issues and criteria must be met to show compliance with the taxonomy.

BREEAM-SE is a third-party assessment and certification scheme that requires an assessor for the rating and assessment report (Sweden Green Building Council, 2017). All certification decisions must be based on verified, traceable, and credible project information and thus, clear and well-referenced evidence has to be produced that demonstrates compliance with BREEAM-SE issues. "To award a BREEAM-SE credit, the assessor must be satisfied beyond reasonable doubt that the evidence gathered demonstrates unambiguous compliance with all relevant criteria defined in the BREEAM-SE scheme." (Sweden Green Building Council, 2017, p.34)

Overall, the process of obtaining the BREEAM certificate includes two stages or reviews. Firstly, there is a design stage assessment carried out that confirms the new buildings' performance before the beginning of operations on site. To complete the assessment, the design must be advanced to the point where design information is available to verify the performance against the criteria. If successful, the BREEAM-SE rating is labeled as "interim". Secondly, there is a post-construction assessment where the assessor confirms the final as-built performance against the interim certification. If a design stage assessment has not been completed, the assessor will still have to review evidence from the interim design stage and compare it with the final post-construction stage.

## 2.2 Key economic consideration for implementing green building certification systems in commercial properties

The exploration of key economic considerations in implementing green building certification systems for commercial properties lays the foundation for understanding the complicated relationship between sustainability and property valuation. Vimpari and Junnila (2014) emphasize that the choice of property valuation method plays a vital role in determining the market value. In this context, the discounted cash flow (DCF) approach stands out as a

predominant standard for income-generating properties like commercial office buildings, both within Sweden as well as internationally. This is because the cost approach falls short of providing realistic and reliable market values since it is often difficult to estimate the potential cost of reconstructing the building. With the sales comparison approach, it is hard to distinguish truly comparable properties, especially with certified buildings still constituting a clear minority of commercial office buildings. The DCF approach is beneficial since it allows for the inclusion of numerous relevant factors that affect the cashflows of the building both now and in the future. With the DCF approach, the market value of the property is calculated by discounting the future cash flows and the exit value with a suitable discount rate (Leskinen et al., 2020). This discount rate reflects the general risk of the property and the return required from a potential investor (Bellman & Lind, 2019; Leskinen et al., 2020; Ratnatunga & Parker, 2021).

However, the relevance of these economic considerations extends beyond the valuation methodologies. In the upcoming chapters, a deepening into the broader economic impact of green building certification systems on commercial properties will be provided. The discussion will firstly, encompass the influence of these certifications on rental and sales premiums, influence on operating costs, and occupancy levels examining empirical findings from both North American and European markets. By scrutinizing studies such as Fuerst and Wetering (2015), Chegut et al. (2014), and Leskinen et al. (2020), nuanced insights are gained into how green building certification systems, specifically BREEAM distinctly shape the economic performance of commercial properties. Moreover, an exploration of the driving forces and benefits associated with certified green buildings is made, focusing on the motivations behind the price and rental premiums. External drivers, including government incentives and regulations, shape the sustainable building landscape. corporate-level drivers highlight the strategic integration of corporate responsibility, while property-level drivers emphasize reduced risk, increased rental income, and decreased property costs. Furthermore, a scrutinization of the perceived higher construction costs associated with certified green buildings contrasts the prevailing notion with studies suggesting that cost is not a major hindrance for BREEAM-certified commercial offices. A discussion regarding the complexity of cost dynamics offers varied perspectives on the construction cost premiums of certified green buildings (Chegut et al., 2019; Hu & Skibniewski, 2021).

## 2.3 The economic impact of green building certification systems

While numerous studies have assessed the financial benefits and economic impact of green building certification systems, the majority of the studies originate from North America and the LEED certification framework in particular (Devine & Kok, 2015; Doan et al., 2017; Porumb et al., 2020; Vimpari & Junilla, 2014). These findings and evidence certainly contribute to the issue of how green building certification systems impact the economic performance of commercial properties. However, it is essential to bear in mind the potential differences between the North American and European markets. Therefore, the following section of the literature separates empirical findings found in previous research surrounding the economic impact of green building certifications from Europe and BREEAM with those from North America focusing on LEED.

### 2.3.1 Evidence from Europe

When investigating whether BREEAM certifications constitute a rent-premium on commercial office buildings in the UK, Fuerst and Wetering (2015) found a clear positive correlation between BREEAM certification and office rents. The results show that the rental premium exists over time and ranges between 23-26% above rent from comparable non-certified buildings. Similar findings were reported by Chegut et al. (2014) who concluded that BREEAM-certified commercial buildings experience a rental premium of 19,7% and a sales price premium of 14,7%. Moreover, Addae-Dapaah and Wilkinson (2020) also found a clear rental premium of 4,3 % for BREEAM-certified office buildings as well as a price premium of

22,3%. It was further noted that both the price and rental premium correlated with certification level, with findings indicating an even higher premium for BREEAM Outstanding and Excellent-rated buildings. Regarding the price premium found by Addae-Dapaah and Wilkinson (2020), Porumb et al. (2020) came to a similar conclusion when investigating the potential sales price premium of certified commercial office buildings in Europe when they found that green certification brings a price premium of 19% compared to comparable non-certified office buildings. Moreover, Vimpari and Junilla (2014) found a clear value increase of 9% for certified commercial office buildings in Finland compared to non-certified comparable buildings.

The relatively low rental premium found by Addae-Dapaah and Wilkinson (2020) compared to previous findings by Fuerst and Wetering (2015) and Chegut et al. (2014) was argued to be due to the study's narrower focus on office buildings in London. They argue that certified commercial office buildings in metropolitan areas with high-quality buildings tend to experience a lower premium since such markets are more mature and certifications and sustainable characteristics are expected in high-quality areas. This view is confirmed by Porumb et al. (2020), and Addae-Dapaah and Wilkinson (2020) confirm this in their study as they found that certified buildings in outer zones with no clusters of BREEAM-certified buildings generate a higher premium than those in the central business district. Interestingly, Fuerst and Wetering (2015) also reflected on the relatively high rental premium found in their study and argued that it is unclear whether it could entirely be attributed to the certification label itself. One possible explanation was argued to be the "introduction" effect, suggesting that as BREEAM is introduced to the market, the scarcity of BREEAM-rated buildings coupled with a high demand inflates the premium above what it would otherwise be. This view is confirmed by Warren-Myers (2012) who argued that it is common with new products that the price point is higher and that values are inflated due to the considerable demand and limited supply. Large price premiums for certified commercial buildings found in earlier studies can very well be the consequence of a "hot" market, which would then result in a future decrease and stabilization of such premiums as the market matures.

### 2.3.2 Evidence from North America

Moving on, several studies have found both price and rental premiums of certified office buildings in North America. Amongst the more early studies are Wiley et al. (2010) who found that LEED-certified commercial properties command a rental price premium of approximately 15-17%. After that, several studies have found similar results although quite not as high premiums. Amongst those are Reichardt et al. (2012), Devine and Kok (2015), and Fuerst and McAllister (2011) who all found a significant rental premium for certified commercial properties of 3%, 4%, and 5% respectively. Fuerst and McAllister (2011) also found that the rental premium together with increased occupancy rates and reduced risk due to the LEED certification resulted in a price premium of 25%. Das and Wiley (2014) also investigated the potential transaction price premium of LEED-certified commercial buildings and found a significant premium of 11%. However, while Das and Wiley (2014) found the price premium to increase over time, Reichardt et al. (2012) came to the opposite conclusion that the premium over time declined. The argument by Das and Wiley (2014) is that as the market matures and the knowledge regarding sustainable and certified properties and their benefits spreads, the demand increases. But here, more recent work by Leskinen et al. (2020) reaches a different conclusion supporting the findings of Reichardt et al. (2012). They argue that rent premiums tend to decrease over time as the supply of certified buildings increases. As sustainable and certified buildings become more mainstream, it is the regular non-certified buildings that will suffer from obsolescence and tighter regulations, resulting in a potential discount on such buildings instead of a premium on their counterpart. This corresponds to the conclusions drawn by Addae-Dapaah and Wilkinson (2020), Fuerst and Wetering (2015), and Warren-Myers (2012) who suggest that green building certification becomes a norm and is expected in high-value buildings in metropolitan areas when the market matures and the supply increases.

### 2.3.3 Additional findings

Approaching the subject from a broader geographical view, Leskinen et al. (2020) carried out an extensive review of previous empirical findings focusing on the impact of green building certificates on commercial property values and cashflows. With most of the studies originating from North America and Europe, they found increased rental premiums of 0 to 23%, increased occupancy levels of 0,9 to 17%, and lower operating costs ranging between -14,3 and -25,8%. The combination of these factors improving the cashflows of certified commercial properties, coupled with evidence of a lower yield (capitalization rate) indicating a perceived lower risk, resulted in increased sales prices which were found to vary between 0% and 43% with a mean of 14,8%. Worth noting is that while the results indicate a clear premium for certified buildings, this premium seems to vary significantly between studies, and several reached inconclusive results. It was further argued that green building certificates are not equally valuable in different markets. For example, in the Nordic countries where the quality of construction is high and building standards are tight with current regulations, the value of certificates is lower compared to countries where the quality varies more (Leskinen et al., 2020). This view is confirmed by Vimpri and Junilla (2014), explaining that the basic construction quality in the Nordics is more developed, and several developers argue that even the LEED Gold level can be reached in Finland with business-as-usual design, thus diminishing the perceived value of certification systems.

As the findings presented above suggest, there is a growing consensus in the literature of a price and rental premium for certified commercial buildings, which is a view confirmed by amongst others (cf. Devine & Kok, 2015; Robinson & Sanderford, 2016; Oyedokun, 2017). However, Robinson and Sanderford (2016) contribute to this issue with an interesting study where they critically examine whether the certification in itself accounts for the price and rental premium. They, together with Chegut et al. (2014) who share the same view, argue that one potential explanation for the price and rental premium that certified commercial buildings experience is that they are new, premium buildings with features and characteristics that would command a price premium even if the certification was disregarded. However, their findings provide little evidence for this theory, thus they are unable to disregard the value contribution of the certification itself on commercial real estate.

## 2.4 Drivers and benefits of certified green buildings: Exploring price and rental premiums

The economic considerations underpin almost every decision to determine social priorities (Addae-Dapaah & Wilkinson, 2020), and as explained by Christensen et al. (2022) the decision to build green and certify properties is primarily based on some kind of cost-benefit analysis. The development of certified buildings incurs higher construction costs, which are then expected to be offset by a value premium of the building (Leskinen et al, 2020). Thus, with monetary evaluation dominating the decision-making process of sustainable construction (Nasereddin & Price, 2021), there have to be benefits with certified buildings that motivate the price and rental premiums found in previous research. While there appears to be consensus in the literature regarding the fact that certified green buildings experience superior benefits, both financial, social, and environmental, compared to their conventional counterparts, it is not yet clear whether these benefits entirely motivate the price and rental premium. When analyzing the drivers for sustainable buildings, Andelin et al. (2015) divide these into three categories: external drivers, corporate-level drivers, and property-level drivers.

### 2.4.1 External drivers

External drivers are set by an external part and include government incentives, regulations, national standards, customer demand, etc. (Andelin et al., 2015). Naturally, they differ between countries, and by reacting proactively to such external factors, actors can gain a competitive advantage as well as mitigate the downside risk related to changed legislation and/or change preferences by tenants. Regulatory risks are frequently cited as one of the major drivers for



investing in sustainable commercial properties (Chegut et al., 2014; Christensen et al., 2022). Given the extensive impact of the real estate sector on the climate, future regulations will be even more strict, thus striking against buildings without sustainability considerations. Fuerst and Wetering (2015) and Warren-Myers (2012) explain that there is an increase in public pressure through increased regulations and standards which drives the increased number of certified properties. However, Collins et al. (2018) found in their study that legislative compliance was regarded as a very low driver for investing in or occupying BREEAM-certified properties.

Regarding a potential shift in customer demand, it is argued that as tenants become more informed, they will demand space that aligns with their corporate social responsibility strategies (Andelin et al., 2015). Therefore, maintaining competitiveness in the market as a result of increased sustainability demands from tenants is one of the major driving factors behind the increase in certified properties (Christensen et al., 2022). Brown et al. (2016) also found that tenant demand is one of the most important drivers behind certifying buildings because the increased awareness among tenants requires building owners and developers to invest in such buildings to remain competitive. Collins et al. (2018) also found that this view is shared among building owners. Customer demand was seen as one of the most prominent drivers for investing in BREEAM-certified office buildings. A differential in rental rates and occupancy levels between green spaces and conventional office space is also inevitable if the demand from tenants shifts (Andelin et al., 2015). Green building certifications, through their signaling effect, clearly distinguish high-quality from low-quality buildings (Flowers et al., 2019). In light of this, the concept of brown discounts has emerged where buildings that are not certified might rent or sell for less in markets where green standards have become more common and more buildings are certified (Brown et al., 2016). Market participants tend to in greater occurrence avoid buildings with poor environmental performance due to future legislation and taxation risk (Fuerst & Wetering, 2015; Reichardt et al., 2012). Vimpri & Junilla (2014) also argue that non-sustainable buildings likely will experience increased vacancy and faster depreciation in the future. Consequently, the business case for investing in sustainable properties currently rests on risk reduction, and not the proven return advantage (Andelin et al., 2015).

#### 2.4.2 Corporate level drivers

Corporate-level drivers encompass primarily corporate strategy, image, and marketing benefits (Andelin et al., 2015; Leskinen et al., 2020). The prospect of future and more onerous legislation together with changing client demands have led developers and property owners to integrate corporate responsibility as a strategy in order to achieve either higher returns or reduce the downside business risk. Corporate responsibility (CR) is described by Andelin et al. (2015) as actions or situations where the firm goes beyond compliance and engages in actions that appear to further some social good, beyond the interest of the firm or what is required by law. Companies have increasingly recognized the risks and opportunities associated with CR in terms of reputation, therefore taking action to ensure that their corporate behavior is responsible in the eyes of their stakeholders. Flowers et al. (2019) argue that the two most important reasons behind green building certifications are appealing to key stakeholders and communicating building and organizational quality.

Demonstrating commitment to CR through green building certification results in public image improvement and marketing benefits (Fuerst & Wetering, 2015). Isaksson and Linderoth (2018) report increased pressure from stakeholders on companies to increase the focus on sustainability in the construction and real estate sector. Corporate image and marketability have frequently been cited as one of the major drivers for sustainability investments in the construction and real estate industry (Brown et al., 2016; Oyedokun, 2017; Ratnatunga & Parker, 2021; Shibani et al., 2021). Research has shown that certified properties enjoy a clear marketing and image benefit which increases the demand from clients and consequently the value of the property (Fuerst & McAllister, 2011). Porumb et al. (2020) argue that firms with better reputations more easily attract investors, charge higher price premiums, and have more

talented employees. This marketing benefit is not only important for constructors, developers, and investors but also for tenants who obtain the benefit of marketing and reputation (Reichardt et al., 2012). Collins et al. (2018) found that company policy and culture were the most prominent drivers for both investing in and occupying BREEAM-certified offices.

#### 2.4.3 Property level drivers

Lastly, property level drivers include decreased risk, increased rental income, decreased property cost, and increased property values (Andelin et al., 2015; Leskinen et al., 2020). As argued by Leskinen et al. (2020) and Gabe and Rehm (2014), the possibility of achieving higher rents is one of the most encouraging benefits for investors. Christensen et al. (2022) add that even though CR strategies drive the overall sustainability agenda, asset-level decision-making is dominated by some kind of cost-benefit analysis. Nonetheless, the rental premiums and willingness to pay are driven by the attractiveness and demand of green buildings from a tenant's perspective. Devine and Kok (2015) found in their study that besides increased occupancy levels for certified properties, tenant satisfaction and increased probability of lease renewals were also found in such properties, implying a certain degree of stickiness. Thus, there seems to exist an increased demand for certified properties which is reflected in the value and rent premiums presented in section 3.1. Several studies have found that this tenant demand is primarily reflected in numerous intangible benefits of certified properties. Such benefits include better indoor environmental quality resulting in increased productivity, increased health, and well-being, reduced employee absenteeism, etc. (Shibani et al., 2021; Fuerst & Wetering, 2015). MacNaughton et al. (2017) explain that buildings play a key role in shaping our health and that they can create conditions that are harmful or conducive to health.

Interestingly, it was found by Leskinen et al. (2020) and Addae-Dapaah and Wilkinson (2020) that the certification itself is one of the least prioritized factors by tenants, thus indicating that the increased rental premium is not a result of the label itself. This is confirmed by Oyedokun (2017) who also argues that while the green premium for certified commercial properties has been firmly established, it is not yet clear whether occupants value the certification as significant when choosing office space. Addae-Dapaah and Wilkinson (2020) found that marketability was the least prioritized factor by tenants, thus suggesting that the certification in itself is not valued. Several studies have instead pointed toward the importance of location, with Brown et al. (2016), Addae-Dapaah and Wilkinson (2020), Shibani et al. (2021), and Robinson and Sanderford (2016), all suggesting that proximity to public transport and services are the most prioritized factors by tenants when choosing office space.

Shibani et al. (2021) found that BREEAM-certified buildings increase the health and well-being of occupiers, which further improves satisfaction and increases productivity. MacNaughton et al. (2017) found that participants in green-certified buildings in the US had 26,4% higher cognitive function scores and 30% fewer sick building symptoms than those in non-certified buildings. Fuerst and Wetering (2015) argue that indirect social and financial gains can be achieved through improved occupier health and well-being resulting in increased staff efficiency and productivity together with reduced absenteeism and higher staff retention. Andelin et al. (2015) found in their study that improved productivity was one of the main drivers from a tenant's perspective behind occupying certified properties. Newsham et al. (2018) explain that over 80% of the operational expenses associated with occupying office buildings are made up of salaries and benefits. With the attributes of certified buildings resulting in increased occupant health and well-being which increases productivity, there are clear financial motives behind occupying a certified office building. However, quality studies examining the linkage between building characteristics and organizational productivity are rare, and one important reason is the lack of appropriate metrics. Productivity influenced by numerous factors, many of which are not easily quantified. However, in an attempt to evaluate the increased productivity associated with certified office buildings. Newsham et al.

(2018) collected associated metrics and found a clear increase, which indicated higher productivity levels for occupiers of such buildings.

On the contrary, Brown et al. (2016) did not find that certified commercial buildings through improved indoor environmental quality had any effects on employee absenteeism or improved productivity. However, they argue that this could be because the indoor environmental quality standard in Sweden is higher than in the US where the majority of the studies have been conducted. In addition, Altomonte et al. (2017) compared BREEAM and non-BREEAM-rated office buildings when investigating occupant satisfaction with indoor environmental quality and found that BREEAM certification per se did not have any significant or substantive influence on satisfaction with the building and the workspace. Users of non-BREEAM-certified office buildings expressed a statistically significant higher satisfaction with air quality and visual privacy. However, as explained by Oyedokun (2017), while there have been plenty of claims regarding the benefits of certified buildings, there have been troubles quantifying them empirically. Steinemann et al. (2017) also explain that for example, indoor air quality is difficult to measure due to lack of consistent metrics. It is further unclear whether occupier benefits such as improved health and well-being and increased productivity can be exclusively linked to certified sustainable properties because they are affected by several different factors other than building space.

Aside from increased rental income and increased property values, research has also found clear evidence of decreased risk and decreased property costs of certified buildings (Andelin et al., 2015; Oyedokun, 2017). The decreased risk from a property-level perspective stems from the lower yield associated with such buildings which has been found in several studies (Vimpari & Junilla, 2014; World Green Building Council, 2013). In addition, McGrath (2013) found that overall, certified commercial buildings had lower capitalization rates than their non-certified counterparts. Vimpari and Junilla (2014) also found clear evidence of a lower yield for certified commercial properties in their study. A lower capitalization rate indicates a less perceived business risk, reflecting higher demand and increased expected growth rates. It is argued that capitalization rates already incorporate future potential increased rental rates and sales prices and thus, examining the capitalization rate of certified commercial buildings determines their value more fairly.

Furthermore, decreased property costs through reduced energy and water demand are the most direct and easily explained benefits of certified buildings (Brown et al., 2016; Shibani et al., 2021). With energy consumption representing approximately 30% of the operating expenses of a normal office building (Porumb et al., 2020), certification systems such as BREEAM help focus on cost-reduction in such areas. This view is shared by McGrath (2013) who argues that energy cost is the largest and most manageable operating expense for commercial properties. Research has clearly shown that operating expenses tend to decrease in certified buildings and that these savings generally exceed any design and construction cost premiums (Vimpari & Junilla, 2014; World Green Building Council, 2013). Collins et al. (2018) argue that the upfront increased construction cost was not seen as a barrier to investing in BREEAM certifications because of the long-term financial benefits, dominated by lower operating and maintenance costs.

On the contrary, Brotman (2014) states that the research behind improved energy efficiency for certified buildings is conflicting. While there certainly are those who have found certified buildings to use less energy, the opposite has also occurred, and several have provided insignificant results. Many of the aspects and requirements of certification have little to do with energy efficiency and both new certified buildings and new non-certified buildings generally share many of the same characteristics. Therefore, there may be little measurable effect between the energy efficiency of certified buildings and their non-certified counterparts, only the higher levels of certification will provide statistically significant results. Brown et al. (2016) also argue



that energy efficiency is often attained without certifications through corporate policies and strategies.

## 2.5 The cost of certified green buildings

While the advantages and benefits of certified commercial buildings have been firmly established in both literature and practice, investments in such buildings are still restricted due to the increased construction cost (Brown et al., 2016; Nasereddin & Price, 2021; Porumb et al., 2020). The negative perception of an increased initial cost for certified commercial buildings has developed into one of the primary challenges and barriers to delivering sustainable construction. On the contrary, Collins et al. (2018) found in their study that cost was not seen as a barrier to investing in or occupying BREEAM-certified commercial offices. Isaksson and Linderöth (2018) argue that construction companies might not always look beyond the direct cost of building sustainability, thus resulting in a mismatch between perceived value and actual value. However, despite this general perception of a higher upfront cost, there exists little empirical research and no systematic evidence addressing differences in construction costs between certified and non-certified commercial properties (Brown et al., 2016; Chegut et al., 2019; Leskinen et al., 2020). This view is shared by McGrath (2013), explaining that while there exists a perceived view that certified commercial buildings come with a greater construction cost, quantifying this expense has proven challenging. One reason is argued to be that there exists a natural heterogeneity in the construction industry (McGrath, 2013; Rehm & Ade, 2013), where there are low-cost certified buildings as well as high-cost conventional buildings. Another argument for the difficulties in investigating the increased construction cost of certified commercial buildings is lifted by the World Green Building Council (2013), highlighting that countries with a strong emphasis on sustainability and the green agenda embedded into their building regulations will experience a lower cost premium for constructing green certified buildings. This view is shared by Leskinen et al. (2020), Hu & Skibniewski (2021), and Vimpari & Junilla (2014), as previously mentioned, contend that the fundamental construction quality and building standards in Nordic countries are exceptionally high. Thus, several certification standards and requirements are already fulfilled by following current standards. This not only results in a potentially lower price and rental premium but also a lower difference in construction cost for certified commercial buildings.

Additionally, it is argued by the World Green Building Council (2013) that the construction cost premium of certified buildings is generally perceived by industry actors as higher than it is. This is something Brown et al. (2016) experienced through their extensive qualitative study in Sweden where they discovered a clear view among building owners that the production price of certified commercial buildings is significantly higher than for conventional comparable buildings. However, it was also found that this increased cost in reality was very low (<5%) and much lower than anticipated beforehand. Others who have investigated the issue are Chegut et al. (2019) who conducted an extensive study where the construction cost of BREEAM-certified commercial properties in the UK was compared to comparable non-certified buildings. They found a statistically significant construction cost premium averaging 6,5%. Additionally, a strong positive relationship between the level of environmental certification and construction cost was found, with the highest levels of BREEAM being up to 31% costlier to construct compared to non-certified buildings. Although, the evidence also suggests that buildings with only Pass, or Good rating can be constructed without any cost premium. The World Green Building Council (2013) also conducted a rigorous study around the business case for green buildings and found the cost premium for BREEAM-certified commercial buildings ranging between 0 and 12%, with the premium positively correlating with the level of certification.

Furthermore, some studies have investigated the issue but have not found statistically significant results. Among those are Dwaikat and Ali (2016) who analyzed the empirical evidence of cost premiums for certified in the US and found that the majority of the premiums range between -0,4% and 21%. However, due to the extensive span between different studies,

no conclusive answer was found. Rehm and Ade (2013) compared the construction cost of certified green office buildings in New Zealand with comparable conventional buildings and found that on the whole, green buildings are not inherently more expensive than comparable conventional ones. While they found that green buildings on average cost more, numerous buildings were also found to be below the modeled cost. Thus, it was concluded that such cost variance reflects the heterogeneity of the commercial building stock, and consequently no clear evidence of a cost premium was found. Hu and Skibniewski (2021) conducted an extensive literature review on a global scale and found that the cost premium for certified green office buildings was on average 6%. They also found that the average cost premium for certified green buildings in Europe was 3% and in the US 7%. Lastly, a positive relationship between certification level and construction cost was found, with a higher certification level increasing the construction cost.

In summary, the negative perception of an increased construction cost for certified properties compared to their comparable counterparts is regarded as one of the major obstacles to investments in sustainable buildings (Brown et al., 2016; Nasereddin & Price, 2021; Porumb et al., 2020). However, little empirical evidence to support this view has been presented (Brown et al., 2016; Chegut et al., 2019; Leskinen et al., 2020), mainly because there exists a natural heterogeneity in the construction industry where it is possible to construct low-cost certified buildings as well as high-cost conventional buildings (McGrath, 2013; Rehm & Ade, 2013). Some studies have found clear evidence of a cost premium (Brown et al., 2016; Chegut et al., 2019; World Green Building Council, 2013) while others found no statistically significant result (Dwaikat & Ali, 2016; Rehm & Ade, 2013). In addition, it was found that the construction cost is very much connected with current building standards and practices, thus resulting in a natural difference between different markets and explaining the divergence in evidence (Hu & Skibniewski, 2021; Leskinen et al., 2020; Vimpri & Junilla, 2014).

## 2.6 Green building certification systems and the project process

With little research having been conducted regarding the increased construction cost of certified commercial buildings, the same can be said of how certification systems impact the project process of construction projects. The majority of studies examining green building certification systems such as BREEAM focus on the relationship between these assessment tools and building performance or the financial benefits. Limited emphasis has been placed on the individuals and professionals responsible for using the framework and implementing it in construction projects. Nevertheless, research studies have attempted to fill this void in the existing body of literature. Amongst those are Schweber (2013) and Phung et al. (2023) who both investigated the effect of BREEAM on construction professionals. It was found that the framework certainly adds complexity to the project process and that professionals are subject to a constant trade-off between the cost and benefits of obtaining credits. However, as the market matures and the knowledge and experience increase, frameworks such as BREEAM will become an integrated part of the project process, leading to decreasing delays and cost overruns in the future.

### 2.6.1 The concept of visibility

An interesting finding by Schweber (2013) was the versatile concept of visibility that the certification framework contributed to. By assigning points to certain practices and weighting certain areas, BREEAM highlights certain aspects of sustainability and through that obscures others. This view is shared by Steinemann et al. (2017) and Brown et al. (2016) who found that the decision to aim for green building certifications introduced an incentive to include measures that otherwise would not have been considered. This highlights an advantage of BREEAM in promoting sustainability issues since it can be utilized by professionals and project members to defend and promote sustainable commitments in the project team. As argued by Haroglu (2013) BREEAM confers increased authority upon the design team throughout the project process. It further widens the perspective regarding sustainable solutions and measures and additionally

hinders changes such as cheap fittings and simple solutions which often are implemented in the construction stage to save money (Schweber, 2013). Moreover, it offers specific metrics for aspects of sustainability that are often challenging to quantify. This is crucial, as improvement is feasible only when measurable, as emphasized by Christensen et al. (2022).

However, as previously explained the concept of visibility is multifaced, and while it does highlight important issues, it does obscure others. Brown et al. (2016) state that for example energy reduction is an often-cited benefit of green building certification systems. However, they concluded that energy reductions were often achieved without such frameworks, mainly through corporate policies. Thus, credit levels in such areas risk limiting the efforts made by the project team where they might feel satisfactory with meeting the criteria when they in reality could have gone even further to deliver a more sustainable building. Doan et al. (2017) further state that one frequent issue is that actors gather enough points to achieve certification but avoid addressing pertinent issues related to the sustainability of the building. Thus, the certification framework in a way restricts the sustainability efforts since it narrows the focus on solely meeting the demands of criteria. In addition, Steinemann et al. (2017) explain that there is a common misunderstanding that certified buildings have equal performance in all areas of the certification. Critique is raised towards studies examining the impact of green building certifications on indoor air quality (IAQ): “None attempted to explore whether the effects of improved IAQ can be attributed to the higher number of credits awarded for IAQ in green buildings. The studies implicitly assumed that this was the case” (s. 353).

#### 2.6.2 Complexity and additional work

Regarding the impact of BREEAM on the dynamic of construction project processes, Phung et al. (2023) initially stated that building projects are complex, unique, time-consuming, and involve multiple stakeholders and disciplines. In the prevailing project management mostly focused on financial goals and driven by time, budget, and scope constraints, the implementation of certification systems constitutes a complex addition to the project process. This complexity arises primarily from a combination of the integration of more sustainable features together with the multitude of requirements imposed by certification systems (Haroglu, 2013; Kang et al., 2013; Korkmaz et al., 2011). Their requirements do not only relate to materials and technical solutions but also bureaucratic work in gathering information and evidence to prove that requirements have been achieved. Collins et al. (2018) found that building owners experienced the BREEAM process as overly difficult. The bureaucratic process of going through the certification was seen as burdensome and ineffective. Besides, the certification systems focus heavily on defining and measuring sustainable features of the final product, and no attempt is made to guide project management in how to initiate and deliver sustainable projects (Phung et al., 2023).

Furthermore, Herazo and Lizzarralde (2015) strongly emphasize the importance of a “green building champion” in coordinating and integrating the variety of stakeholders involved in the certification process. The stakeholder role includes not only obtaining the points needed for green building certification but also generating a collaborative and innovative project environment. This champion can also be a tight team involving stakeholders responsible for facilitating communication and mobilizing other stakeholders in the process of obtaining a green building certification. Herazo and Lizzarralde (2015) further found that green building certification results in tensions between stakeholders in project teams which negatively impacts the project and certification process. Leadership is the most influential factor in mitigating these tensions, thus ensuring a collaborative, effective, and successful project performance during the certification process. Consequently, it proves the importance of a green building champion or a green building leader as a central stakeholder in the project team. The advantage is that green building leaders see the certification process as central, while other stakeholders merely consider it time-consuming and extra work.

Furthermore, to deal with the complexity of green building certification frameworks, several authors have highlighted the importance of early planning and coordination (Hu & Skibniewski, 2021; Kang et al., 2013; Orsi et al., 2020; Phung et al., 2023). The management of the design stage and the early planning is vital given the extensive costs and delays associated with late changes to the design and poor management of the certification process. As argued by Kang et al. (2013) the greater project complexity and additional requirements of certified buildings puts greater demand on the pre-project planning to lower the risk of cost overruns and delays. Insufficient planning and unclear responsibilities regarding who is in charge of the different credits result in the need to go back for information to prove the fulfillment of certain credits which vastly increases the time and additional work. Frequently, points end up being lost due to the inability to gather evidence. While Orsi et al. (2020) argue that BREEAM as an assessment tool is important in providing a systematic and standardized framework that helps organizations integrate sustainability in their projects, the vast amount of information and evidence gathering is cited as a recurring issue (Schweber, 2013). To obtain credits, the project team has to provide clear evidence which requires that extensive and sometimes unnecessary amounts of information have to be gathered only to achieve relatively simple credits. Consequently, a vast amount of time is spent by professionals in additional bureaucratic work for BREEAM-related issues.

To cope with both the complexity added and the extensive information and evidence requirements of certification systems, experience is vital (Hu & Skibniewski, 2021; Nasereddin & Price, 2021; Schweber, 2013; Shibani et al., 2021). Nasereddin and Price (2021) even state that inexperience in green building certification frameworks is the primary cost driver of such projects. Limited knowledge and experience with certification frameworks result in uncertainty, and it is the uncertainty that fosters complications, delays, additional work, and cost overruns. This is also confirmed by Schweber and Haroglu (2014) who found clear evidence that previous experience with BREEAM had a positive impact on the project and certification process, reducing cost overruns and delays. However, they also found that a successful and effective certification process could be reached with a proactive and skillful assessor despite the absence of prior BREEAM experience within the project team. Thus, they highlight the importance of the assessor in facilitating the certification process.

### 2.6.3 Explaining cost premium

Section 2.5 provides some empirical evidence of cost premiums for certified commercial buildings. Although this premium seems to vary significantly, this section perhaps provides some explanation for why this premium exists. As described above, certification frameworks such as BREEAM increase the complexity of construction projects, often resulting in delays, additional work, and cost overruns. Chegut et al. (2019) found in their study clear evidence that BREEAM-certified buildings on average take 11% longer to complete than conventional buildings and that this time increases with certification level. Brotman (2014) also argues that the certification process incurs delays in the project process and that this is a large disadvantage for such projects. Longer building time is a significant disadvantage for the developer since longer construction time results in greater risk due to a longer time to pay for construction and labor equipment, as well as a longer need for working capital which increases the capital cost. They further concluded that certified building design costs are on average 32% higher than for conventional buildings and that this influences the decision-making process in a disproportional way to its absolute value. It is argued that the design premium becomes visible for developers since the design is carried out early on in the project to avoid changes later on. Thus, even though the design cost constitutes a small part of the total construction cost since the entire design budget is spent before construction starts, the design premium for certified projects becomes visible and thus impacts the perceived view of a higher construction cost for such projects. On the same note Kang et al. (2013) explain that increased efforts in the pre-project planning for certified projects result in superior cost performance. However, increasing the time spent on planning increases the up-front cost. Thus, even though it certainly benefits such

projects from a holistic perspective, it does contribute to the view or perception that certified projects are associated with increased costs.



### 3. Methodology

The following chapter presents and motivates the chosen methodology of the study. An initial explanation of the research approach and a presentation of the study's context is followed by a detailed description of the data collection and data analysis. Lastly, the trustworthiness of the study, and methodological limitations, including the author's reflections is presented.

#### 3.1 Research approach

While the relationship between theory and research together with the research strategy constitutes the essence of the research approach, it is initially important to explain the role of theory in this study. Bell et al. (2019) explain that the term “theory” is often associated with abstract grand theories, but the term “theory” can also refer to the background literature in an area of inquiry, acting as the equivalent of a theory and consequently being used to define the research agenda. This view was adopted in this study and consequently, the research direction was shaped by existing background literature and research questions were developed by critically examining current literature on the subject.

Before determining the research strategy and subsequently concluding the research approach, the relationship between theory and research has to be established. Bell et al. (2019) elaborate on three different approaches or views on this relationship, including the deductive, inductive, and abductive approaches. Given the explorative approach and investigative purpose of this study, the inductive approach was found most suitable. As explained by Bell et al. (2019), this approach involves drawing generalized inferences out of observations and developing theory through empirical findings. It involves identifying patterns from empirical findings to reach conclusions and build theories (Hair et al., 2019), thus suitable for the thesis. However, Bell et al. (2019) explain that one has to be careful with the use of the term “theory” in the context of the inductive strategy. The purpose of this study is not to develop theories, but rather to draw generalized conclusions and identify patterns from empirical findings.

Regarding research strategy, Bell et al. (2019) explains that a distinction can be made between quantitative and qualitative research strategies. In general, quantitative research emphasizes quantification and measurable results in the collection and analysis of data and is most commonly associated with the deductive approach. Qualitative research on the other hand tends to be concerned with words or images rather than numbers and is therefore often associated with the inductive or abductive approach. Qualitative research is discovery-oriented and is therefore based on inductive reasoning (Hair et al., 2019). Quoting Bell et al. (2019) regarding qualitative research: “The stress is on the understanding of the social world through an examination of the interpretation of that world by its participants” (s. 356). Consequently, by capturing the perspectives of the participants, qualitative research is well suited for exploring complex and nuanced phenomena, since it allows for a more in-depth investigation, generating rich, descriptive data and a deep contextual understanding of a problem. Given the exploratory stance and descriptive focus of the study, together with the complex nature of the subject, the qualitative research strategy was adopted to create the best conditions for fulfilling the aim and purpose.

#### 3.2 Study design and context

Bell et al. (2019) present five different research designs, and for this research approach, the case study was utilized. A case study can encompass an organization, location, person, or event but the common denominator is that the focus is on a bounded situation or system and an intense examination of that particular setting (Bell et al., 2019). Therefore, qualitative research is often favored in case studies given the deep contextual understanding that the approach offers. A case study provides an excellent opportunity to investigate the research questions in a suitable setting, and the qualitative approach provides a nuanced and in-depth picture of the subject. It is further described by Bell et al. (2019) that case studies can be used for drawing generalizations, and rather than building new theories, case studies are well suited to refine

existing ones, thus corresponding well to the inductive approach. According to Yin (2017), the selection of a case study approach is significantly influenced by the nature of the study's research question(s). The author further explains that a selection of a case study research becomes particularly relevant when the research questions seek to explain some present circumstance, but also if the questions necessitate an extensive and "in-depth" description.

Given these considerations, the adoption of the case study approach is justified as the most suitable for this study. The extensive scope of the research questions, particularly those delving into the economic impact of BREEAM certification on commercial properties and its impact on the project process, called for a methodology that facilitates a comprehensive exploration. This approach not only allows for a thorough understanding and examination of the intricacies inherent in the case under study but also enables a nuanced exploration and a deep dive into a real-world scenario with specific practices and circumstances. A common critique of case study research is its limited ability to facilitate broad generalization and its perceived lack of scientific rigor, where the result is often not easily transferred to different settings (Yin, 2017). In this study, the case revolved around a commercial office building, currently under construction in the outskirts of Gothenburg. The selection of this particular project is primarily driven by its status as an illustrative case of sustainable commercial property development in Sweden. The case study was conducted in collaboration with a large construction company in Sweden with a strong presence in Gothenburg which will be further referred to as "the developer". They have an in-house policy to certify all new commercial property buildings with at least BREEAM Excellent. Given the representativeness of the study's context and the fact that the broader perspective of the developer is also investigated, the case study could be seen as instrumental, where the case can be used to understand a broader issue or challenge generalizations (Bell et al., 2019). Commonly, single case studies are intrinsic, meaning that they primarily gain insights into the particularities of the situation rather than other cases or generic issues. However, this can be seen as a representative or typical case as described by Bell et al. (2019), which provides the possibility to draw general conclusions from the research.

### 3.3 Data collection

Given the inductive approach and the qualitative research strategy, data were collected through semi-structured interviews.

#### 3.3.1 Interview study

Utilizing an interview study is usually a long process, but frequently this signifies that the interviews will yield valuable insights and a deeper understanding of the subject, justifying the time and effort invested (Bell et al., 2019). The qualitative study of this thesis consists of semi-structured interviews with key stakeholders involved in the project. Qualitative interviews are usually semi-structured and chosen for this study because they allow the researchers to keep an open mind, and let concepts and theories emerge out of the data (Brinkmann & Kvale, 2014). In semi-structured interviews, the interviewer adheres to a script to some degree, which provides full and extensive answers as well as for the interviewers to ask follow-up questions. Bryman and Bell (2017) emphasize the importance of having a primary understanding of the desired outcome from the specific interview, with the reason that the understanding aids in formulating the follow-up questions and tracing the respondents' thoughts. This type of selected structure of interview also results in a deeper understanding of the subject and reduces the risk of missing information as a result of a narrow interview framework.

As previously noted by Bell et al. (2019), a qualitative study provides broader coverage and is less constrained than a quantitative research in the range of selectable individuals. Thus, a broad selection of stakeholders encompasses individuals in the large construction firm's property development department, offering an overview of their role along with the organization. In accordance with the guidance of Brinkmann and Kvale (2014), individual interview guides for

each respondent were created, encompassing both the project's overarching research inquiries in academic terms and a corresponding set of vernacular questions for use during the interviews.

The selection of the interviewees was based on their involvement in the project, aiming to gain an in-depth understanding. The selection criteria focused on individuals who played a key role in the project and could provide valuable insights into the practices and dynamics. The respondents interviewed encompassed a diverse range of roles, including Project Manager 1, QEHS Coordinator (Quality, Environment, and Health and Safety), BREEAM AP, Property Developer, Project Manager 2, Lease Manager, and Head of Department. Additionally, regular conversations with our supervisor from the company were instrumental. For more details about the selected interviewees, see Table 3.

In total, seven interviews were conducted for the study and the interviews were completed over teams, with each interview lasting approximately 45 minutes. The interviews were recorded after each respondent gave their consent regarding the recording, and then subsequently transcribed to facilitate further analysis.

	<i><b>Role</b></i>
<i>Respondent 1</i>	Project manager 1
<i>Respondent 2</i>	QEHS coordinator
<i>Respondent 3</i>	BREEAM AP
<i>Respondent 4</i>	Property developer
<i>Respondent 5</i>	Project manager 2
<i>Respondent 6</i>	Lease manager
<i>Respondent 7</i>	Head of the department

*Table 3. List of the selected interviewees*

### 3.4 Data analysis

Qualitative data analysis does not adhere to standardized rules to the extent that quantitative data analysis does (Bell et al., 2019). The qualitative data analysis in the study involved the adoption of the thematic analysis approach, a method that is frequently employed when it comes to dealing with qualitative datasets. Moreover, this approach involves the identification and exploration of themes within specific empirical data throughout the entire study. A theme can be explained differently in various sources, with many describing a theme as more or less the same as a code. Repetition may occur within a single data source, such as an interview transcript, or, more commonly, across multiple data sources. Braun and Clarke (2006) also assert that the thematic approach is an accessible, flexible, and progressively favored method for qualitative data analysis. Although thematic analysis does not have strictly defined procedures such as the grounded theory, the method is very popular due to its flexibility and adaptability as an analytical approach (Bell et al., 2019).

The thematic analysis approach is characterized to consist of various phases, where the initial phase of the analysis commenced during the interview study. An identification of the different themes could be based partly on listening to the interviews again and partly on analyzing the



transcript from Microsoft Teams. These identified themes were recurring subjects sorted based on their relation to the research questions, i.e. The economic impact of BREEAM, The cost of BREEAM, Drivers and benefits of BREEAM certification, BREEAMs' impact on the project process, and lastly Managing the increased complexity and requirements of the certification. This manner of analysis breaking down themes and sub-themes persisted throughout the entire study.

### 3.5 Trustworthiness of the study

While the three most prominent criteria of evaluation for quantitative research are reliability, replicability, and validity, many researchers agree that these aspects of assessing quality are inappropriate with limited application for qualitative research (Bell et al., 2019). Instead, four aspects of trustworthiness have been suggested as criteria for evaluating qualitative research. Firstly, credibility which considers how believable the findings are. Secondly, transferability concerns how the findings apply to other contexts. Thirdly dependability relates to whether the findings are likely to apply at other times. Lastly, confirmability considers if the researcher's values have intruded on the findings, thus impacting the objectiveness of the research.

The representativeness of the case and the fact that the participants have experience with multiple similar projects in the past improves the credibility of the study. Additionally, credibility was enhanced by the continuous peer debriefing with the supervisor of the thesis. However, credibility could have been enhanced by comparing multiple different cases with each other. Regarding transferability, by focusing on depth rather than breadth and the fact that the study was naturally impacted by the special characteristics and the specific context of the case, transferability was hampered. On the other hand, the case is regarded as representative of the subject and the industry, consequently providing the possibility to draw general conclusions. Further, to ensure the dependability of the study, there was consistency throughout the case regarding documentation and record-keeping of the research process. Additionally, the thematic approach ensured a consistent way of analyzing theory and data throughout the study which also improved the confirmability. Lastly, while complete objectiveness in business research is impossible (Bell et al., 2019), confirmability was ensured by maintaining reflexivity and thoroughly documenting data and the research process to reduce potential biases and subjectiveness. In conclusion, the research process and the findings associated are considered to possess a high level of trustworthiness.

### 3.6 Ethical considerations

Bell et al. (2019), clearly highlight the importance of ethical considerations to maintain the integrity of business research. It is explained that ethical issues generally revolve around four main areas, including potential harm to participants, lack of informed consent, invasion of privacy, and potential deception. It is important that the research does not harm the participants in any predictable way, and that they have a clear understanding of their involvement in the study.

Regarding avoidance of harm, it is the responsibility of the researcher to carefully assess the possibility of harm to participants and take reasonable precautions to minimize the risk that participating respondents suffer harm directly or are adversely affected. To prevent any potential harm to the study participants, precautions were taken. The identities of the respondents were kept anonymous, although their role in the project had to be declared for the trustworthiness of the study. Only the contact person within the company under study, who provided the participants' contact information, was privy to their identities. Emphasis was also placed on informing the research participants about the study's purpose, their role as participants and the utilization of interview materials. Consequently, an informed decision could be made by each participant whether or not to participate in the study. Additionally, as the second ethical principle of informed consent revolves around ensuring that participants

receive sufficient information to make an informed decision about their participation, this action also covered the second ethical issue.

It is explained by Bell et al. (2019), that the third ethical issue of privacy is very much linked to the second one of informed consent. By participating in the study based on a detailed understanding of what the involvement is likely to entail, the participants acknowledge that privacy has been surrendered for a limited domain. However, during each interview, the respondents had the opportunity to refuse to answer certain questions or cancel the interview on whatever grounds they felt justified. Further, the fourth ethical issue of preventing deception is considered through the information each potential participant received before each interview. As explained by Bell et al. (2019), deception occurs when the researchers present their research as something other than what it is. By providing information about the purpose of the study and each participant's role in the study, as well as a copy of the final report before publication, it was made sure that the respondents were not deceived in the study.

In addition, Bell et al. (2019), highlight some other areas of ethical and legal considerations aside from the four main ethical issues. One area relevant to this study is data management, where the routine around collection, storage, and sharing of data is important to consider. To address this issue, respondents were informed that all information, including recordings and transcripts, from the interview study, was deleted at the end of the research period. Additionally, the information was stored in files only accessible to the researchers, and not shared with anyone else. Furthermore, since the researchers had access to privileged information during the research period, a confidentiality agreement was signed with the company subject to the study.

### 3.7 Limitation

To maintain a clear focus and acknowledge potential constraints, several methodological limitations were strategically established for this study. The qualitative approach in this study, relying on only eight interviews, limits the potential for statistical analysis. Moreover, the research's representativeness is somewhat limited because it revolves around a specific project, thereby affecting its generalizability. The empirical data collection process is purposefully directed towards the precise subject matter of the study, even though the theoretical framework encompasses broader insights within the field. Another temporal constraint to be aware of is the study's duration, covering a finite six-month period, which means that the long-term impacts of BREEAM certification on property value may not be fully observed, particularly after the anticipated completion of the project in 2024. The selection of interviewees is also influenced by their availability, potentially impacting the diversity of perspectives included in the study.

Lastly, the chosen methodology for the study was considered by the researchers as suitable for the aim and the purpose of the research. However, there is always room for improvement, and for example, more interviews could have been conducted in order to capture even more perspectives and aspects of the issue. However, since the research primarily revolves around a case study, it was important to interview professionals with a close connection to the project. Additionally, a pre-study could potentially have been carried out to both test the interview questions and gain a better view of the respondent's understanding of the topic. Lastly, to fully investigate the economic impact of certifications on commercial properties, several comparisons and preferably a quantitative study would have been required. However, this was not possible due to time and resource constraints, and the authors are satisfied with the results and consider the research to provide valuable insights into the topic.

## 4. Result

The following chapter presents the empirical findings of the study, presented in the topics of drivers and benefits of BREEAM certification, the economic impact of BREEAM, the cost of BREEAM, BREEAMs' impact on the project process, and lastly managing the increased complexity and requirements of the certification.

### 4.1 Drivers and benefits of BREEAM certification

Regarding the drivers and motives behind certifying by BREEAM, it was initially revealed by the interviewees that the property developer had decided to certify all new office properties by at least BREEAM Excellent. According to respondent 5, this decision was aimed at positioning the company in the front end of the market to increase the return and the value of the buildings developed. It was also to improve the image and the sustainability profile of the company and align the operations with the corporate strategy. A similar view was displayed by respondents 4 and 7 but it was also explained that the decision to aim for Excellent stems from the responsibility of the company towards the environment and society since the construction and real estate sector accounts for a large environmental impact. Additionally, respondent 7 highlighted an internal benefit of BREEAM, noting that it serves as an efficient tool to measure sustainability efforts, acting as a helpful checklist to ensure that the right practices are being implemented in relevant areas. It was explained that it is reassuring that sustainability issues are well incorporated into the projects.

Aside from the internal motives behind certifying office properties with BREEAM Excellent, the external motives were also discussed during the interviews. Several respondents stated that selling the property would be nearly impossible without certification, as it has evolved into a "hygiene factor" (standard practice) in today's property market. It was explained that it is not a question of whether the property is certified or not anymore because it has become a standard practice for new commercial properties and a prerequisite for being able to sell it on the market. Interviewee 7 explained that the certification is the first concern of investors due to primarily financing reasons. By certifying properties, real estate firms and investors can access green bonds and better financing terms, and today, every real estate firm certifies their properties. Additionally, the latest version of BREEAM has been developed to align with the EU taxonomy, which was explained to be attractive for both investors and tenants. By either investing in certified properties or occupying such spaces, the company shows alignment with EU taxonomy requirements which is seen as a major incentive. However, it was explained that tenants do not show particular awareness of the benefits of aligning their occupied space with the EU taxonomy yet. Instead, investors are more concerned with this aspect at the moment. Furthermore, the question was also raised whether or not the certification in itself will be needed to show alignment in the future. As explained by respondent 3:

*“Environmental certifications with the included third-party-assessment could potentially be a tool to demonstrate alignment with the taxonomy in the future to facilitate, but it is difficult to determine how it will evolve. Perhaps property owners will only care about aligning their operations with the taxonomy without involving certifications.”*

Consequently, the external demand was found to be almost solely driven by investors. Tenants showed very limited interest in the certification itself. Interviewee 6 explained that tenants are more following the market without explicitly demanding certification on the properties they occupy. It is implicitly expected that developers work with sustainability and sustainable solutions in their properties. Certifications are therefore in many cases expected, but it does not matter which certification has been used or the level of certification. Both respondents 4 and 6 explained that they do not believe it would be more attractive for tenants if the building achieved the level Outstanding instead of Excellent since the certification is merely a general check for a sustainable, high-quality building. However, there seems to be a growing interest among some tenants in certifications. Mainly large companies that seek to align their business

strategies with their occupied space. From the beginning, the tenants did not ask for certification at all, but as the knowledge increases and includes sustainability in their corporate strategies, there is a shift towards more interest and sometimes demand for certifications.

From the developer's perspective, instead, several other factors rank higher for tenants when choosing spaces to occupy. Respondent 7 explained that they have conducted surveys that showed that certifications were ranked significantly lower than other aspects such as location, rent, facilities and services, and access to public transport. Both respondents 4 and 6 believe that tenants are attracted by the entire concept of the property involving services, facilities, and location, but that the rent is the bottom line that in the end is the most influential factor. Therefore, the certification was not anything they could explicitly use in negotiations with the tenants. It was once again highlighted that it has become a "hygiene factor" where it is expected that a newly constructed office is sustainable and certified. Respondent 6 instead explained that tenants consider the general sustainability profile of the developer. Instead of demanding each building to be certified, it is the company's general sustainability profile that might attract tenants. Knowing that the developer actively works with sustainability and sustainable solutions could be more important than that the property is certified to a specific level.

*"The tenants consider it a given that we work with sustainability and sustainable solutions, and they value our sustainable profile. But they do not specify detailed requirements in the negotiations regarding BREEAM, and we are not in any negotiations concerning those parameters."*

#### 4.1.1 The economic impact of BREEAM

In general, the interviewees found it challenging to evaluate the economic influence of BREEAM certification on the office property, whether in terms of either increased value or potential rent premium. It was early established that the certification could not be utilized in rent negotiations to motivate a higher rent from potential tenants, as there were several other factors deemed significantly more crucial. Instead, the investor's perspective and the potential price premium were focused upon. Respondent 7 explained that they had heard that you achieve at least a 2-3% price premium for certified properties but that they have not seen any real empirical evidence of such numbers. Several respondents also explained that investors certainly ask for and require a certification on their properties, but it is difficult to determine whether or not they would pay a premium for it. As explained in section 4.1, certifications on newly produced properties have developed into a "hygiene factor" and it is nowadays a standard requirement set out by investors. In some areas, there has even been an inflation in certifications with buildings receiving four or five certifications which according to multiple respondents certainly does not increase the value of the property. When discussing rent and price premiums, it was explained by several respondents that newly produced buildings naturally are more expensive compared to the current properties available, thus making it hard to evaluate if the certification in itself contributes to the rent and price premium. As explained by respondent 4:

*"We cannot motivate a price premium simply because we have certified the property with BREEAM Excellent. However, we would probably not have been able to sell it if it had not been certified in the first place."*

While the majority of participants didn't perceive BREEAM to constitute any rent or price premium for the certification in itself, it was discussed whether or not the certification had an indirect impact on the economic value. Respondent 1 explained that in general, few understand what is included in the framework and the certification level Excellent can mean different things depending on each project and which credits you achieve. Respondents 4 and 5 therefore explained that while the certification label itself may not directly increase the building's value, the resultant reduction in operating costs could motivate a higher overall value. Thus, it is the



tangible effects such as reduced operating costs or improved energy efficiency that can increase the economic value and not the intangible aspects of the certification label. There was also consensus among the respondents that the certification level does not matter and does not constitute a price premium. Contrary to the notion of receiving a price premium for reaching a higher certification level, interviewee 7 instead explained that you get punished by not reaching a certain level and that investors are only interested in the level that is required for accessing green bonds and green financing.

*“My theory is that you do get punished for not reaching a certain level but you are not getting paid for reaching a higher level than the least expected, which in this market probably is Excellent.”*

It was argued that if the developer were to only achieve a Very Good as BREEAM rating, it could likely lead to market repercussions, with numerous questions arising about the building and its functionalities. Therefore, BREEAM Excellent is almost required for newly produced buildings because any lower certification level would make the transaction very difficult. Thus, it was seen as more likely that buildings not reaching a high enough certification level would be subject to a price discount by investors.

Furthermore, despite the importance of tangible and quantifiable aspects in increasing the economic value of the property, it was not found that some areas of the certification framework such as water use or energy efficiency are considered more important due to their potential benefit on operating costs that would in turn increase the value of the property. It was explained by several respondents that it is very difficult to ignore credits or aspects of the framework when aiming for the level of Excellent. The project team has to work with all areas to make sure enough points are gathered to reach the set level. Additionally, respondent 3 explained that the developer already directs a large focus on energy-efficient buildings since it is already established that a building with low operating costs is more attractive and obtains a premium, therefore BREEAM does not further contribute towards lower operating costs. However, it was also explained by respondent 5 that BREEAM to some degree further increases the focus towards for example energy efficiency and water use which decreases operating costs, and that this is an important benefit of the framework. Respondent 4 also explained that:

*“If we had not struggled with BREEAM and implemented as efficient solutions as possible, the operating cost per month would have been higher than if we worked with BREEAM. What you can get paid for is if you can prove that you have lower operating costs in the property.”*

Nevertheless, respondent 7 clarified that the ultimate value creation of BREEAM depends on the specific circumstances and contract, explaining the challenges in evaluating the economic value created by the certification. In general, the market value for commercial properties can be determined by the division of net operating income by the yield. In this particular case, the yield was fixed beforehand, and thus it was explained by several respondents that the only thing the developer could do to increase the property value was to increase the rents and decrease the operating cost. Since the certification could not be used to motivate any rent premium, BREEAM was instead seen as beneficial by some of the respondents because of its focus on aspects that impact the operating phase. However, it was argued the developer would have worked with those issues even if it were not for the certification because they know that such aspects are important for the economic value. Therefore, it was difficult to determine whether or not the certification in itself increased the value of the building.

#### 4.1.2 The cost of BREEAM

When discussing the cost of BREEAM, it was generally agreed by all interviewees that the certification increases the cost of the project. Respondents 2 and 3 explained that BREEAM as

a certification framework is relatively costly and comprehensive. Therefore, several actors instead choose Miljöbyggnad or other local certification frameworks that are not as cost-driving and demanding. However, the broad coverage in sustainable focus areas by BREEAM and its international profile was stated to be two of the major benefits of the framework.

The increased cost that the certification imposes on the project was explained by several interviewees to originate from primarily three sources. Initially, there are discernible costs linked to both the BREEAM Accredited Professional (AP), an expert role integrated into project design teams, and the BREEAM Assessor, responsible for overseeing the formal assessment process throughout the project. Given the fact that their involvement started with the project start-up in 2017, the amount of time spent on the certification process adds up to a significant cost over time. Interviewee 1 explained that the budget for the BREEAM AP and the BREEAM assessor was set for around 1 MSEK and 600 000 SEK respectively. Although the BREEAM AP is not required, it was argued that appointing one certainly simplified the certification process. Secondly, there are the potential costs for technical solutions, material choices, or other actions implemented to acquire credits in the framework. To meet certain criteria, there are potential cases where technical solutions or systems are needed that otherwise would not have been implemented. Such systems can be costly to operate and sometimes unnecessary. Respondent 7 described a situation in a previous project where they had to install individual heating controls in each room of the building to acquire credits needed for a certain certification level. However, this system was not at all requested by the client and building owner who found it both unnecessary and complicated to use. Consequently, the system was not at all used in the building but still constituted a significant cost for the developer. As explained by the respondent:

*“The operators found the system difficult and challenging to use, which meant we made a significant investment on behalf of the certification that was subsequently not utilized.”*

The third primary cost driver was argued to be administrative costs and the hidden costs associated with time and extra work required by individuals to achieve credits. The vast documentation and evidence gathering require a lot of resources which are driving costs. It was explained that the responsibility for investigating and obtaining credits was delegated amongst project members in different disciplines. They were then responsible for attaining the credits and carrying out the administrative work. The amount of time and additional work required by each project member was then dependent on their knowledge and experience together with the project specifics. Thus, it is difficult to track the potential hidden costs since they are both project-specific and depend on the individuals responsible for the credits. However, throughout the project, a large amount of time and effort was certainly spent on administrative tasks and information gathering that would not have been required if it were not for the certification. Respondent 1 explained that they spent at least a couple of hours per week on BREEAM-related issues, and over a 6-7-year period, this adds up to a significant cost. However, even though the extra time and money required to achieve BREEAM Excellent is considered in the budget, it is only the explicit costs of the BREEAM AP and the BREEAM Assessor that are separately accounted for. The interviewees agreed that the administrative costs and the hidden costs constitute a significant part of the total added cost for the certification. Respondent 3 explained that:

*“For those of us working specifically with BREEAM in the project, our costs are quite clear, and we can quantify them. However, all the hidden hours that other project members invest have not been separately accounted for, so we do not know the time and cost perspective involved. But it is a significant amount of money we are talking about.”*

Furthermore, it was difficult for the respondents to assess the difference in size between these three cost drivers. Some argued that the administrative costs constituted the largest part while others argued that it was the cost of the BREEAM AP and BREEAM Assessor that were most

significant. It was generally agreed that the cost of technical solutions or similar constituted the smallest part of the additional cost. Respondent 5 explained that the certification level of Very Good was practically achieved by only following the standard building regulations. The quality of construction and building regulations can differ significantly between countries, but numerous credits are already in line with Swedish building regulations and standards. It was also revealed that the developers themselves in several areas put higher demands on the building than those imposed by the certification framework. Certain areas are not included in the framework that the developer therefore works with separately such as the social aspect and CO2 emissions. The additional cost for achieving BREEAM Excellent therefore primarily stemmed from the additional time and work associated with the administrative demands, and potentially some technical solutions or other building attributes. In general, it was also agreed by the interviewees that the additional cost increased with the certification level. Apart from the increased administrative costs, there are probably significant costs for technical solutions to obtain the level of Outstanding, and it is quite a big leap to aim for the Outstanding level in terms of additional costs. As described by respondent 5:

*“Aside from the administrative demands that increase with each certification level. There are probably technical solutions and systems that drive the cost to a greater extent than what can be seen for achieving Excellent. When moving from Very Good to Excellent, it is more about screwing up the requirements and it is not a very big leap.”*

Lastly, it was concluded that BREEAM certainly was more cost-driving during its initial introduction to the Swedish market. With the developer's choice to certify all new commercial buildings as BREEAM "Excellent," the certification has evolved into a company-wide standard. Since 2011, it has become an integral aspect that everyone within the organization must collaborate with, and over time, the company has accumulated extensive experience in this regard. When it was first implemented, it forced improved documentation and verification of materials, solutions, and actions that were not considered in standard practices at that time. Additionally, respondent 5 explained that the market was not ready for certified properties when they were first introduced. Consequently, the cost at that time likely exceeded the benefits, but this dynamic has since evolved. Presently, the experience certainly facilitates the certification process. Given the tightening and increased focus of building regulations on sustainability, certifying today is much more straightforward and less cost-intensive. However, it is still difficult to evaluate the trade-off between the cost and benefit of obtaining certain credits. Especially since some areas are considered more important due to their weighting in the framework. Additionally, it was argued that some credits might look easy to attain but require a large amount of work, mostly administrative. Respondent 3 explained that:

*“Some points are easy, but the administrative work and documentation required to provide evidence become very time-consuming. Sometimes the risk is too great that the right documentation is not obtained or produced, and the whole work fails.”*

#### 4.1.3 Summary of the economic aspects of BREEAM

In summary, it is evident from the empirical findings that the developer in general is unsure regarding the financial benefits of certifying their properties. It is evident that the certification cannot be utilized in rent negotiations, and many investors and tenants consider it to be a “hygiene factor”. The interviewees agreed that they would not have been able to sell the property if it were not for the certification. It is therefore not considered that the investors are willing to pay a price premium for a certified property because it is already expected. However, it is the investors together with the developer themselves that currently drives the demand since limited interest in the certification itself has been shown by the tenants. Moreover, it is clear that the certification brings an additional cost to the project but this cost varies depending on the project together with the knowledge and experience of the project members. In general, it is possible to achieve the Very Good rating by simply following current building regulations

and standards, and therefore achieving Excellent is merely a small step. However, the general perception is that the cost would increase significantly to reach Outstanding but it is not considered to be worth it from a financial point of view since investors mostly are concerned with meeting the demands required to access green bonds and green financing.

#### 4.2 BREEAM's impact on the project process

Given the decision taken by the developer to certify all new commercial buildings with BREEAM Excellent, the certification has developed into a company-wide standard and something that everyone must work with, even in the face of its impact on the project workflow. Therefore, it was sometimes difficult for the respondents to single out and assess the impact of the certification alone on the project process since it is now considered a standard procedure. However, there was consensus between the respondents with the findings indicating a notable increase in workload and increasing complexity.

During the interviews, it was challenging to pinpoint which specific roles were most affected by the implementation, and determining the specific project phases with the greatest effects proved challenging. Nevertheless, there was a unanimous agreement among respondents that overall complexity increased across the board, even though it was not delineated in terms of roles and project phases. Firstly, the additional requirements from BREEAM result in the necessity for numerous new tasks, solutions, and investigations that would not typically be required in conventional construction projects. It was argued that some aspects of the framework are not part of standard practices and therefore the certification raises awareness and forces the project team to consider multiple aspects of sustainability.

Regarding BREEAM's sustainability scope of the project process, there was a divergence of opinions among the interviewees. Respondent 2 underscored that BREEAM has heightened awareness of sustainability, particularly as the new manuals emphasize durability, resilience, and sustainability over time. On the other hand, there is a common emphasis on accumulating points and meeting certification requirements in BREEAM often leading to tailored solutions based on a building's unique characteristics, potentially resulting in suboptimization. However, BREEAM's ability to spotlight critical sustainability issues, including climate impact, material usage, life cycle costs, and energy efficiency, serves as a counterbalance. While there may be a tendency towards suboptimization, it was discovered that BREEAM offers a valuable framework for reflecting on and addressing these essential sustainability considerations. Ultimately, the respondent highlighted that there is a balance between adhering to certification requirements and embracing a broader perspective on sustainability.

On the other hand, respondent 2 does not delve into the topic of suboptimization but instead underscores that the company has already established internal sustainability requirements and has stricter requirements than BREEAM in some areas. This indicates an orientation towards exceeding the minimum requirements and focusing on more ambitious sustainability goals within companies. A concrete example that the respondent mentioned is regarding their waste management, where BREEAM sets a limit of 15% landfill, while the company itself has tightened the requirements to 80% recycling and only 5% new landfill. As explained by the respondent 2:

*“BREEAM should be a help on the way for the company's sustainability work and initiatives.”*

Furthermore, the responsibility to investigate and attain credits along with the administrative work is then often delegated amongst individual project members in different disciplines. The amount of time and additional work required by each project member was then dependent on their knowledge and experience together with the project specifics. As showcased in section 4.2, respondent 5 who works as a project leader explained that they spent at least a couple of



hours a week on BREEAM-related issues which over a 6-7 year project period adds up to a significant amount of time. Respondent 3 explained that:

*"We do not always really know how much extra time and work it takes to achieve certain credits because it depends on the knowledge and experience of each individual who is given the responsibility. Then it is about documenting everything to be able to provide the evidence required."*

In general, it was evident from the interviews that it is primarily the extensive scope of BREEAM together with the administrative demands that constitute the complexity and additional work imposed on the project. When aiming for Excellent, respondents 1 and 3 explained that it is very difficult to ignore credits and aspects in the framework because the project team has to work with all areas to make sure enough credits are achieved. It is not feasible to solely pursue standard solutions and procedures, given that BREEAM imposes requirements on a wide spectrum of building aspects. In this context, it was explained that BREEAM does increase the focus on sustainability and forces the project team to consider aspects that would otherwise not have been considered. As explained by respondent 1:

*"The BREEAM certification significantly amplifies our emphasis on sustainability. It makes us break down and carefully consider each point and aspect of the project, fostering a level of consideration that may not have been as comprehensive otherwise."*

However, respondent 3 argued that the developer already works with many of the areas covered in BREEAM. Additionally, the developers themselves often put higher demands on the building than those imposed by the certification. Certain aspects, such as the social aspect and carbon dioxide emissions, are excluded from the existing framework in BREEAM. Consequently, the developers were required to address these areas independently in both the studied project and other ongoing projects. The BREEAM certification system primarily emphasizes technical and environmental aspects. To address the deficiency of social aspects in BREEAM, respondent 3 asserts that it becomes an internal responsibility, suggesting that property developers should manage social aspects through their internal requirements. Given the extensive sustainability focus already implemented by the developer, it instead becomes a difficult trade-off between the additional work required and the benefit of achieving certain credits. Especially considering that some aspects are valued higher in the framework with the weighting of the system. Some credits might look easy to attain but require a large amount of work, mostly administrative. In such cases, it might sometimes be difficult to motivate the additional time, work, and cost, required to meet a criterion that does not create value or result in environmental benefits. In light of this, the administrative demands were therefore regarded as the largest part of the additional work and complexity that the certification imposes on the project. As explained by the respondent 3:

*"The question is whether the administrative and work-related requirements are proportional to the environmental or sustainability benefits they generate."*

It was also explained by respondent 2 that this is a consequence of the international profile of the certification framework. Standards and practices differ between markets and countries and because Sweden is relatively far ahead in terms of sustainability in the construction sector, some aspects of the certification are already part of standard practice, thus only requiring substantial administrative work and time which can be viewed as unnecessary in some cases. It was explained that when BREEAM was first introduced to the Swedish market, it forced an improved accounting system for materials and other questions of issues that were not part of the standard practice at that time. Subsequently, the evolution of building regulations and standards in Sweden has been notable, with a heightened focus on sustainability. Remarkably, the BREEAM certification level Very Good has become practically attainable by adhering solely to the standard building regulations.

Therefore, respondent 5 explained that nowadays it is more about tightening up the demands when looking at the difference between the certification levels Very Good and Excellent. The additional effort to achieve Excellent primarily stems from the additional time and work associated with the administrative demands since the level of Very Good is practically achieved by following standard building practices. The additional time and work required were argued to increase with the certification level. Moving from Excellent to Outstanding was argued to be quite a big leap where not only the administrative work required increased but probably also the need for more advanced technical solutions or systems that are cost-driving to a greater extent than what can be seen from the demands related to the Excellent level.

Finally, respondent 3 explained that the complexity of implementing BREEAM is reflected in the fact that there are always some questions and challenges that emerge when delving into the details. Especially concerning requirements related to materials and emissions that consistently demand meticulous monitoring. It was explained that when striving for the rating of Excellence, you may not have numerous issues to resolve, but attention must be given to every detail and certain areas might pose greater challenges than others. A specific issue that the project group encountered pertained to the management of surface water drainage for the project. Initially perceived as under control, a closer examination revealed non-compliance with BREEAM requirements in this regard, which necessitated certain adjustments in the project. Moreover, it was found that unexpected indicators may surface during production, necessitating careful consideration and creative problem-solving to meet project requirements.

#### 4.2.1 Managing the increased complexity and requirements of the certification

To deal with this complexity and increased workload imposed by the certification on the project, certain factors were considered especially important by the interviewees. Firstly, the early planning phase was consistently mentioned as an important factor for an efficient certification process by the respondents, and it was argued as crucial to identify both potential obstacles in the certification process and the difficulty level of different credits. Respondent 3 explained that:

*“If we do not address certain aspects early on, they can become very cost-intensive if we have progressed too far in the project planning. It is about identifying what needs to be done at what time.”*

This aspect was further elaborated upon by emphasizing that delays in fulfilling the requirements are also impacting the progress of the project. Consequently, planning and resource allocation are essential to manage the additional workloads and expenses that appear wisely. It was found out in the interviews that an increased need for communication within the project group and with other stakeholders is noted, as BREEAM intertwines issues in both planning and production. This high requirement for effective collaboration among multiple stakeholders has also led to closer integration between the client and the construction contractor, necessitating communication on points and decisions regarding which points can be addressed.

Similarly, considerations for BREEAM certification are integrated into the project's early stages, ensuring alignment with the budget. The significance of this early inclusion establishes a strategic framework with clear indicators that must be addressed in program documents and communications. In light of these considerations, it was highlighted by respondent 5 that the project group recently submitted a specified report, achieving a favourable result of 78%, exceeding the required 70 points and aligning well with the project's objectives. Despite potential challenges in providing tangible evidence to get the credits, it was deemed to have favourable margins at the early stages. As explained by the respondent 3:

*“We consistently incorporate a margin when addressing agreed-upon requirements, providing flexibility during detailed planning and exploration of the specific solution”*

It was argued that there are always complications arising during the project process and therefore early planning is important in making sure there is room for potentially losing some points. As argued by respondents 1 and 3 it can be extremely cost-driving if there is a need to gather certain points in difficult areas to achieve the set-out certification level. If the early planning process has been carried out efficiently, there is greater flexibility to avoid such situations. As a result, it was noted by several participants that encountering themselves in a situation where they completely fail to achieve the goals set for the project related to BREEAM is uncommon. Occasionally, they come across minor issues that may be challenging to anticipate in the earlier stages. This provides them with the opportunity to assess and make decisions on how to address these obstacles, both technically and financially.

Further, another essential factor considered important for dealing with the complexity and the additional requirements of the certification was experience. The developers have now worked with the certification since around 2011 and have built up extensive knowledge and experience throughout the organization. This experience with BREEAM held by members of the project group and contractors within the project team from previous projects was explained by the respondents to be essential and simplify the implementation of the certification process. As argued by respondent 5:

*“Previous experience and collaboration within the organization have proven instrumental in achieving success in BREEAM certification and effectively managing challenges throughout the project.”*

It was further explained that it becomes easier and easier to work with the framework over time and that after several projects it starts to develop into an integrated part of the project process. Respondent 1 explained that it now is especially beneficial to look at previous projects when determining which credits to focus on. This was further explained by Respondent 5:

*“Now we have done it so many times that we know how it should be done. About 70-80% of the BREEAM-related evidence is now quite straightforward, but then there are always questions and issues that arise in each project that need to be addressed.”*

Lastly, when asked about the allocation of responsibilities concerning BREEAM, it was determined that each actor in the project group plays a significant role in achieving the objectives of the property. However, a common theme was recurring, emphasizing the importance of the role of BREEAM Accredited Professional (AP). This role is evident in ensuring a seamless BREEAM implementation process for the project. The role, as described, acts as a form of a process manager, taking a holistic approach to the certification process. It initially ensures that the project achieves the goals set, which mandates projects to achieve BREEAM level Excellent, meaning that a certain score level must be attained within the system. Functioning as an internal role in the studied company, the BREEAM AP begins by strategically planning and setting up a comprehensive implementation plan during the early stages of the project. It also involves coordinating so that all initial investigations with demanding specialists are carried out, which can include everything from energy calculations to ecological analyses. Therefore, the BREEAM AP follows up and ensures that the right people and disciplines take responsibility for various requirements and issues. Respondent 1 explained that:

*“You do not necessarily have to have a BREEAM AP, but it certainly makes life much easier in the project.”*

#### 4.2.2 Summary of the BREEAM's affect on the project proccess

It is evident from the interviews that the certification framework certainly imposes additional, time, work, and complexity on the project process but that this primarily arises from the extensive administrative demands and the overall scope of the certification framework. The developer already works with many of the areas included in the framework but his certification aids in increasing the awareness and focus on sustainability and sustainable solutions. In the Swedish market, adherence to standard building regulations essentially results in the attainment of the certification level Very Good concerning solutions, systems, materials, and other aspects. The time and additional effort required predominantly arise from meeting administrative demands. However, the extensive experience within the organization was argued to facilitate the certification process which now has been integrated into the project process. In addition, the early planning phase and the BREEAM AP were seen as essential for the certification process.

## 5. Discussion

The following chapters examine the alignment between the literature and the empirical study, aiming to assess their agreement or identify any discrepancies. The discussion revolves around the analysis of the research questions outlined in the report.

### 5.1 The economic impact of BREEAM

In this following section, the first research question “*What is the economic impact of BREEAM certification on commercial properties from a developer’s perspective and how does it contribute to their overall value?*” will be discussed where the empirical findings and previous literature on the subject are compared and analyzed. Firstly, the drivers and benefits of the certification framework will be discussed, followed by the economic impact and lastly the cost of BREEAM.

#### 5.1.1 Drivers and benefits of BREEAM certification

When analyzing the literature and the empirical evidence regarding the drivers and benefits of the BREEAM certification system, it becomes evident that the empirical results can be compared to the three categories of sustainable buildings as explained by Andelin et al. (2015). Regarding external drivers, it appears that customer demand on behalf of investors is the most influential factor for implementing BREEAM. As opposed to Chegut et al. (2014) and Christensen et al. (2022) who argued that regulatory risks are frequently cited as one of the major drives for investing in sustainable commercial properties, the empirical results showed to be more aligned with the results reported by Collins et al. (2018) who in their study found that legislative compliance was a very low driver for investing in or occupying BREEAM-certified properties. The fact that both the empirical results and previous literature (Leskinen et al., 2020; Vimpari & Junilla, 2014) state that several certification standards and requirements are practically attained by following current building regulations and standards in Nordic countries could be a potential explanation for the seemingly low importance of legislative compliance as a driving factor for certification. Building regulations and standards are already to a great extent focused on sustainability and therefore the certification framework is not needed or further utilized to show compliance with such regulations.

The decision by the developer to certify all new properties by at least BREEAM Excellent was instead seen by the interviewees as a strategic decision, aimed at positioning the company in the front end of the market, adjusting to customer demands, and contributing towards minimizing the environmental impact. Consequently aligning it more with the corporate level drivers and with the views of Leskinen et al. (2020), Andelin et al. (2015), and numerous other studies who have emphasized the importance of corporate responsibility, image, and marketing benefits as drivers for certifying commercial properties. Additionally, several respondents explained that the company already focuses a lot on sustainability and has developed a clear sustainability profile. Thus, certifying properties was seen as a natural step to further boost this image. Once again the empirical results align with the findings of Collins et al. (2018) who found that company strategy and culture were the most prominent drivers for investing in BREEAM-certified commercial buildings.

Furthermore, the empirical results showed that the external demand was almost solely driven by investors, with tenants showing limited interest in certifications such as BREEAM. This is conflicting with the results of previous studies where Christensen et al. (2022), Brown et al. (2016), and Collins et al. (2018) all found tenant demand to be one of the driving factors behind the increased number of certified buildings. Instead, it aligns with the findings of Leskinen et al. (2020), and Addae-Dapaah and Wilkinson (2020). However, per the respondents there seems to be a growing interest from some tenants in certification as a result of increased knowledge and interest in sustainability which corresponds to the findings by Andelin et al. (2015), but this is mostly driven by large companies who seek to align their occupied space



with their corporate strategy. In general, there are instead numerous other factors such as location, rent, facilities, etc., that rank higher for occupiers which is consistent with numerous previous studies (Brown et al., 2016; Oyedokun, 2017; Robinson & Sanderford, 2016). While investors are driving the implementation of certifications, several respondents explained that it has developed into a hygiene factor and a standard practice where it is practically impossible to sell a newly produced commercial property without a certification. Additionally, the certification level appeared to have a negligible impact since tenants are more concerned with the overall sustainability profile, and investors are mostly concerned about securing green financing and aligning with the EU taxonomy. The fact that investors are driving the demand and are mostly concerned with meeting the requirements for green financing and the EU taxonomy is an interesting finding that very well may have future implications. The potential future of BREEAM as a tool to show sustainability compliance was raised by one of the respondents and it may very well be the case that certification systems are considered to be excessive.

Regarding property level drivers in terms of for example increased rental income, decreased property cost, and increased property value, it was argued by Christensen et al. (2022) that rental premiums are driven by the attractiveness and demand for certified buildings from a tenant perspective. Gabe and Rehm (2014) further argued that the possibility of achieving higher rents is one of the most encouraging benefits for investors. Given the fact that tenants appeared to show minimal interest in certification, and investors considered it to be a hygiene factor in today's market, property-level drivers were found to be relatively insignificant in this study. Shibani et al. (2021), and Fuerst and Wetering (2015), found that tenant demand stems from an increased attractiveness of certified buildings due to benefits such as improved building quality and improved indoor environmental quality. However, it was found that the developer already works with a great focus on sustainability, indoor environment, energy efficiency, and other aspects present in the BREEAM framework. Consequently, while BREEAM was certainly regarded as improving the overall quality of the building, this was not seen as one of the major drivers behind the implementation of the certification.

### 5.1.2 The economic impact of BREEAM

It quickly became evident that the empirical findings did not correspond to the literature on the financial benefits of BREEAM certification on commercial properties. There is a growing consensus amongst previous research that certified properties experience both rental and price premiums. Evidence from Europe (Addae-Dapaah & Wilkinson, 2020; Chegut et al., 2014; Fuerst & Wetering, 2015; Porumb et al., 2020; Vimpari & Junilla, 2014) provide results of price premiums ranging from 9-22,3% and rental premiums ranging from 4,3-26%. Additional evidence from North America (Das & Wiley, 2014; Devine & Kok, 2015; Fuerst & McAllister, 2011; Reichardt et al., 2012; Wiley et al., 2010;) also indicate price and rental premiums of 11-25% and 3-17% respectively. However, this is not consistent with the empirical findings. Although one interviewee had heard rumors about a price premium of 2-3%, the respondents explained that the certification could not be utilized in rent negotiations, and with investors considering it to be a hygiene factor, the developer could not motivate a price premium simply because of the certification.

Furthermore, the price and rental premiums found in previous studies showed to correlate with certification level where Excellent and Outstanding buildings experienced even higher premiums. Neither this aligns with the empirical findings, with respondents claiming that the certification level does not matter. Investors who are driving the demand are mostly concerned with accessing green bonds and better financing terms, and in today's market, the certification level Excellent currently seems to constitute the lowest requirement. Therefore, one interviewee instead explained that you get punished for not meeting this level and could be subject to potential price discounts by investors. This corresponds to the concept of brown discounts presented by Brown et al. (2016) where properties that are not certified may rent or sell for less

in a market where it has become a standard to certify new buildings. The respondents even explained that it probably would be impossible to sell the property at all if it had not been certified. Which is not very surprising given the fact that the Very Good level is practically achieved by standard practices.

Thus, the empirical results show no evidence of any price or rental premiums. This can potentially be explained by the findings of Addae-Dapaah and Wilkinson (2020) who found lower premiums for certified buildings in areas with high-quality buildings where certifications are expected. On a similar note, Leskinen et al. (2020), Fuerst and Wetering (2015), and Warren-Myers (2012) explain that premiums will decrease over time as the market matures and the supply of certified buildings increases and instead, non-certified buildings will experience a potential discount. Leskinen et al. (2020) also suggested that the value of certifications is lower in Nordic countries where the quality of construction is high and building standards and regulations are already tight. Similar to the empirical findings, Vimpari and Junilla (2014) found in their study that the LEED Gold level in Finland could be reached in Finland with business-as-usual, thus diminishing the value of certifications. Thus, the market in Sweden is now considered mature to the degree that certifications do not improve the value of the building and are instead considered to be standard practice. Lastly, several respondents also explained that newly produced buildings are naturally more expensive compared to current properties available, thus making it hard to evaluate if the certification itself contributes to any price and rental premium. This issue was also raised by Robinson and Sanderford (2016) who together with Chegut et al. (2014), although they did not find any significant results, suggested that one potential explanation for the price and rental premiums was because new commercial buildings are naturally more expensive.

Lastly, it was mentioned during the interviews that the potential improvements in lower operating costs and efficiency as a consequence of the certification framework could increase the value of the building and thus serve as an indirect financial benefit of implementing BREEAM. Brown et al. (2016) together with Shibani et al. (2021) also explained that decreased property costs through reduced energy and water demand are the most direct and easily explained benefits of certifications. Frameworks such as BREEAM help direct focus on efficient solutions and cost reductions in several areas. Collins et al. (2018) also argue that the upfront increased construction cost is more than offset by the decreased operational and maintenance costs. However, the empirical findings suggest that these are aspects that the developer already works with, and since it is practically possible to achieve Very Good through following current building regulations and standards, the certification in itself does not contribute very much to the lower operating costs. However, worth noting is that two of the respondents highlighted the focus BREEAM direct towards increased sustainability and improved building quality in a broader perspective. But in general, the empirical findings are consistent with the findings of Brotman (2014) who suggest that not only do many aspects and requirements of the certification framework have little to do with operating costs, but also there is little difference between new certified and new non-certified buildings when it comes to solutions impacting the operating costs. Brown et al. (2016) also explain that energy efficiency is often attained even without certifications since it is financially beneficial to develop a building with low operating costs.

### 5.1.3 The cost of BREEAM

Previous literature investigating the cost of certification frameworks such as BREEAM has concluded that it is primarily the perception of an increased construction cost that restricts investments in certified properties (Brown et al., 2016; Isaksson & Linderöth, 2018; Nasereddin & Price, 2021; Porumb et al., 2020), but little empirical evidence exists that support this view (Chegut et al., 2019; Leskinen et al., 2020). What became evident during the interviews was that BREEAM certainly increases the cost of the project, and this cost was argued to originate from primarily three sources. However, the cost of improvements in building characteristics

and building quality such as technical solutions or similar was argued to be very small since the certification level Very Good was practically achieved by only following the current building regulations and standards in Sweden. This corresponds well to the findings of Leskinen et al. (2020), Hu and Skibniewski (2021), and Vimpari and Junilla (2014) who explained that the fundamental construction quality and building standards in the Nordic countries are very high, and thus several certification requirements are already fulfilled with standard practices. Chegut et al. (2019) also found that buildings with only a Pass or Good rating could be constructed without any cost premium. As argued by the World Green Building Council (2013), countries with a strong emphasis on sustainability and the green agenda embedded in their building regulations will experience a lower cost premium for constructing certified buildings. Instead, the explicit cost for the BREEAM AP and BREEAM Assessor together with the administrative and hidden costs associated with extra time and work needed to conduct investigations and gather evidence was argued to be the largest contributors towards the cost premium of BREEAM. As argued by among others Phung et al. (2023), and Haroglu (2013) the implementation of certification systems constitutes a complex addition to the project process where a large amount of bureaucratic work is needed to gather evidence and information around all the aspects of the framework. As explained by one respondent, they as project leaders spend at least a couple of hours per week on BREEAM-related issues. Since the project started in 2017, the amount of time spent on the certification process adds up to a significant cost. In addition, the vast documentation and evidence gathering require a lot of resources which further drives additional costs. However, these costs are difficult to track since they are not explicitly accounted for and are more implicit.

This could be a potential explanation for the lack of empirical evidence of a construction cost premium for certified properties. A couple of studies (Brown et al., 2016; Chegut et al., 2019; Hu & Skibniewski, 2021; World Green Building Council, 2013) have found, although relatively low, significant cost premiums for certified properties while others have found no statistically significant results (Dwaikat & Ali, 2016; Rehm & Ade, 2013). The fact that the hidden administrative costs are difficult to track and point out can explain this variety of findings. Since the additional cost for technical solutions and improvements in general building quality driven by the certification is low in well-developed countries, it can be difficult to notice any significant increase in construction cost. As explained by McGrath (2013) and Rehm and Ade (2013) there exists a natural heterogeneity in the construction industry where there are low-cost certified buildings and high-cost conventional buildings. As per the respondents, a newly produced commercial building is already expensive in itself, and with certifications developing into a hygiene factor, it is difficult to separate the additional time and work devoted to the certification process since it now has become an integrated part of the entire project. Additionally, an important aspect of the empirical findings was the fact that BREEAM was considered to be much more cost-driving during its introduction. It forced improved documentation and verification of materials, solutions, and actions that were not considered standard practice at the time. But since then the developer has gathered experience and building regulations have become even tighter which now results in limited effort being needed to carry out a certification. Therefore, it is not surprising that previous research has found a construction cost premium for certifications, and that this premium probably tends to diminish over time.

Lastly, Chegut et al. (2019), World Green Building Council (2013), and Hu and Skibniewski (2021) also found a clear positive relationship between certification level and construction cost premium. This corresponds well to the findings from the interviews where it in general was agreed that the additional cost of BREEAM increases with certification level. While the cost of technical solutions and other building attributes was considered low for the level of Excellent, it was explained that there probably are significant additional costs for technical solutions when aiming for the level of Outstanding. As explained by one respondent, there are cases where technical solutions are implemented that otherwise would not have been considered due to their minimal contributions to the building. But once again this shows that building regulations and



standards together with the maturity of the market have a decisive impact on the construction cost premium. In less developed countries, the cost of technical solutions and building quality improvements might be significant which results in a cost premium. In more developed countries on the other hand the construction cost increase generally stems from the administrative and bureaucratic work that the certification framework imposes on the project process. Since this cost is implicit in nature, it is not surprising that there might be difficulties in providing evidence of a construction cost premium for certified properties.

## 5.2 BREEAM's impact on the project process and strategies to manage the implementation

In this following section, the second research question *"How does the implementation of the BREEAM certification system affect the project process, including its complexity and additional work, and what strategies can be employed to manage its implementation in the construction of a commercial office building?"* will be discussed in relation to the empirical findings and the theoretical framework. The focus is to discuss the intricacies and challenges posed by this process entailed in the implementation of BREEAM, and the section will further discuss strategies to effectively manage the complexity.

### 5.2.1 Complexity and additional work

When analyzing the complexity and the additional work that the BREEAM implementation entails, it became clear that both literature and empirical findings underscore a significant increase in both workload and complexity compared to the standards set in traditional construction projects. As noted in the interviews, BREEAM entails additional requirements, tasks, solutions, and investigations that would not typically be required in conventional construction projects. This can partly be connected to the concept of visibility as presented by Schweber (2013) and confirmed by Steinemann et al. (2017) and Brown et al. (2016) who found that certifications introduced an incentive to include measures that otherwise would not have been considered. Thus, the improved sustainability scope the framework imposes benefits the project but simultaneously creates additional complexity and additional work. As argued by one of the respondents, despite the increased complexity and additional work, BREEAM increases widens the sustainability scope and serves as an efficient tool to measure sustainability efforts. This corresponds to Christensen et al. (2022) who explain that BREEAM offers metrics for areas of sustainability that are hard to quantify, and that improvement is feasible only when measurable.

Additionally, it was also explained by some respondents that meeting certification requirements risked leading to tailored solutions for each building to streamline the project process which potentially results in suboptimization in terms of sustainability efforts. This confirms the view of Brown et al. (2016) and Doan et al. (2017) who suggest that certification requirements risk minimizing efforts made by the project team potentially avoid addressing pertinent sustainability issues. Ultimately it was highlighted by the respondents that there is a balance between adhering to certification requirements and improving the sustainability of the building, and with the developer already focusing extensively on sustainability issues with strict demands and internal requirements, the framework generally complements their initiatives. In addition, it became clear during the interviews that certain aspects such as the social aspect and carbon dioxide emissions are not part of the framework and therefore the developer addresses these issues outside the framework because of their importance.

But in terms of complexity and additional work, the most prominent source was argued by the respondents to originate from administrative demands, overall scope, and bureaucratic work. It was explained that aiming for Excellent resulted in a need to consider all credits and aspects of the framework in order to make sure enough credits are received. As explained by the Sweden Green Building Council (2017) all certification decisions must be based on verified, traceable, and credible project information. This vast amount of information and evidence gathering is cited by Schweber (2013) as a recurring issue with the framework. The consequence is that the project team has to collect and provide extensive and sometimes unnecessary information only to achieve relatively simple credits. This is something that was frequently raised during the interviews, with respondents explaining that it is always a difficult trade-off between the additional work required and the benefit of achieving credits, which is an aspect confirmed by Phung et al. (2023). With some credits looking easy to attain but requiring a large amount of work, prioritizing is important. Here, Kang et al. (2013) also explain that points being lost due to the inability to gather evidence is a recurring issue. And as explained by one respondent, the

question is sometimes whether or not the administrative work and efforts required are proportional to the sustainable benefits they generate.

Additionally, it became clear during the interviews that the time and additional work required to obtain credits varies. The responsibility to investigate and attain credits along with the administrative work is often delegated amongst individual project members, and the additional time and work required depends on their knowledge and experience. Therefore, it was also difficult to pinpoint specific roles or project phases that were subject to the greatest effects of the framework. This is an issue touched upon by Phung et al. (2023) who state that the certification system is mostly concerned with defining and measuring sustainable features of the final product and no attempt is made to guide the project management team in how to initiate and deliver sustainable projects. Chegut et al. (2019) found clear evidence that BREEAM-certified buildings on average take 11% longer to complete compared to conventional buildings and that this time increases with certification level. This is not surprising given the fact that one project leader explained that they alone spent at least a couple of weeks on BREEAM-related issues from start to finish of the project. Additionally, the respondents explained that the additional time and work required certainly increases with certification level, confirming the findings of Chegut et al. (2019).

Lastly, as explained by Phung et al. (2023), building projects are already complex, unique, time-consuming, and involve multiple stakeholders, thus certification systems constitute a complex addition to the project process. Although this was confirmed by the respondents, it was also stated that standards, regulations, and practices differ between countries and that Sweden is relatively far ahead in terms of sustainability in the construction sector. Therefore, numerous aspects of the framework are already part of standard practice here, and the BREEAM-related issues are mostly administrative or bureaucratic. While Collins (2018) found that building owners experienced the BREEAM certification process as overly difficult, the respondents explained that this was the case when BREEAM was first introduced to the market. In contemporary times, the certification process has become so ingrained that it is now regarded as a customary practice. The BREEAM certification level of Very Good is practically attained by following standard practice in Sweden, showcasing the development of building regulations and standards. Consequently, to reach the level of Excellent, one respondent explained that it is more about tightening up the demands and the additional effort mainly stems from administrative work and evidence gathering. This very much aligns with the findings of Schweber (2013), and Phung et al. (2023) who explain that as the market matures and the knowledge and experience increase, frameworks such as BREEAM will become an integrated part of the project process.

### 5.2.2 Managing the complexity

Even though the certification process is now an integrated part of the project process for the developer, it is still necessary to cope with the complexity and additional work the certification system entails. The interview study consistently highlighted the pivotal role of early planning in ensuring an efficient certification process, emphasizing the need to identify potential obstacles and assess the difficulty level of various credits. The interviewees further emphasized the significance of early inclusion in establishing a strategic framework that incorporates clear indicators, which should be explicitly addressed in program documents and communications. This proactive approach was deemed to offer favorable margins, particularly in the early stages of the certification process, potentially losing some points in a later stage. Aligned with these findings, the theoretical framework underscores the significance of early planning and coordination in managing the complexity of green building certification frameworks. Kang et al. (2013) argue that the heightened complexity and additional requirements demand thorough pre-project planning to minimize the risk of cost overruns and delays.

This was further discussed by authors such as Hu and Skibniewski (2021), Orsi et al. (2020), and Phung et al. (2023), all emphasizing that effective management during the design stage is vital to mitigate costs and delays associated with late changes and poor certification process management. Moreover, there was also a consensus between the study and literature that insufficient planning and unclear responsibilities can have unprecedented consequences and underscore the critical importance of establishing a well-defined framework and delineating clear roles within the project team. Kang et al. (2013) exemplify that a potential consequence of these challenges is the loss of points, through the difficulty in collecting the necessary evidence. Along the same line, the concept and the role of “green building champion” are also brought up in 2.6.2, emphasizing effective leadership as an influential factor in order to secure necessary points and create a collaborative and innovative project environment (Herazo & Lizzarralde, 2015). This role is argued to be pivotal during the process of ensuring a collaborative, effective, and successful project performance.

Moreover, another important parameter that was evident from the study is the existing experience of the stakeholders in the project. This is vital in navigating the complexity and managing the requirements of the certification process. According to the interview study, the previous experience held by members of the project group greatly simplified the implementation of the certification process. This extensive knowledge facilitates working with the framework to become more manageable, evolving into an integrated part of the project process but also particularly advantageous in determining which credits to prioritize. This is aligned with both Nasereddin and Price (2021), and Schweber and Haroglu (2014), describing that limited knowledge and experience with the certification frameworks result in uncertainty, which often increases cost overruns and delays. In addition, it was highlighted that a skillful and proactive assessor with prior BREEAM experience within the project team can result in facilitating the certification process. As pointed out by the respondents, the assessor plays a significant role in the project team and is essential for a smooth implementation process, especially for coordinating between the disciplines together with initial investigations and an implementation plan to reach the set goals.

## 6. Conclusion

With a growing awareness and emphasis on environmental accountability and sustainability, sustainable and green properties have gained prominence in the field of commercial real estate. And certification systems such as BREEAM have been introduced and utilized by market actors. However, a research gap has been identified concerning the economic impact of such certifications and their influence on the project process. Through an inductive approach and a qualitative research strategy, including semi-structured interviews and a rigorous review of previous literature on the subject, this report aims at approaching this gap. And the following chapter presents the concluding findings by addressing the two research questions directly.

***RQ1: What is the economic impact of BREEAM certification on commercial properties from a developer's perspective and how does it contribute to their overall value?***

It can be concluded that the economic impact of BREEAM on commercial properties and the framework's overall value contribution from a developer's perspective is a multifaceted issue that very much depends on the specific market in terms of regulations and sustainability development. As evident from the discussion around drivers and benefits of BREEAM certification, legislative compliance, and regulatory risks were seen as very low drivers compared to the findings in the literature. The development of building regulations and standards in Sweden has resulted in the certification level BREEAM Very Good is practically attained by adhering to standard practices. This was seen to impact both drivers, economic impact, and the cost of BREEAM significantly. In today's real estate market, certification on a newly produced commercial building has developed into a hygiene factor, with the level of Excellent seemingly constituting the lowest requirement. Consequently, it was not found to be possible to motivate any price and rental premium because of the certification itself, and potential discounts on buildings without certifications or with lower levels were seen as more likely. An important aspect to raise when discussing the financial aspects is the difficulty in comparing newly produced properties, which is necessary when evaluating potential premiums or discounts.

Regarding drivers behind certifying commercial properties from a developer's perspective, as opposed to the literature highlighted tenant demand, investor demand, and corporate policy were found to be the primary drivers. But with investors mostly concerned about securing green financing and aligning with the EU Taxonomy, the question arises whether or not an extensive and costly certification framework such as BREEAM will seem too excessive in the future. In addition, the certification was not considered important on a property level. Apart from the general increased focus on sustainability, the developer was already greatly concerned with sustainability aspects and worked with the majority of the aspects included in the framework. Therefore, potential improvements in reduced operating expenses, energy efficiency, and building quality as a consequence of the framework might be more prominent in other markets depending on regulations, standards, and sustainability development. Consequently, the current drivers behind certifications stemming from the developer and investors might very well change in the future.

Lastly, it is evident that BREEAM certainly constitutes an additional cost to the project, and this cost increases with the highest certification levels, but this cost is difficult to quantify. As a consequence of well-developed building regulations and standards, the cost for improvements in building characteristics and building quality such as technical solutions and similar was found to be very low since it is often part of standard practice. Instead, the implicit administrative costs driven by the vast amount of bureaucratic work together with the explicit costs for the BREEAM AP and Assessor were regarded as the largest contributors. While the implicit costs are difficult to quantify, they are considered to decrease as the project team gathers experience and the certification becomes an integrated part of the project process.

Consequently, the conclusion can be drawn that while well-developed regulations and building standards diminish the potential financial benefits of certification frameworks such as BREEAM, it does also reduce the additional cost when the frameworks become an integrated part of the project process. Thus, the most significant factor for the economic impact of BREEAM on commercial properties found in this study is the market conditions in terms of building regulations and standards.

***RQ2: How does the implementation of the BREEAM certification system affect the project process, including its complexity and additional work, and what strategies can be employed to manage its implementation, in the construction of a commercial office building?"***

It can be concluded that the implementation of BREEAM certification can lead to increased complexity and additional work in the project process for all involved stakeholders. This marked increase correlated also particularly when aiming for higher certification levels. Nevertheless, it was challenging to quantify the specific additional workload for each individual, as this has been a collective decision over many years and a standard practice within the organization.

However, it is notable that the national context plays a significant role in shaping the implementation and impact of BREEAM certification in the construction of commercial office buildings. In the case of Sweden, where this study is centered, the adherence to standard building regulations essentially results in the attainment of the certification level Very Good concerning systems, materials, solutions, and other aspects. This indicates that the national regulatory framework and industry standards have a direct influence on the integration of sustainability practices, including those required for BREEAM certification, into the project process. Furthermore, the Swedish market's emphasis on sustainability and environmental responsibility provides a conducive environment for the adoption of BREEAM certification.

As revealed by the study, there is a growing demand from future property owners and clients for environmental certification, making it a mandatory requirement for construction companies. As part of this evolution, the adoption of BREEAM certification within the examined company has transformed into a standardized practice across the entire organization. The additional workload imposed by BREEAM certification is becoming an unavoidable aspect that future developers must contend with in their projects. Hence, the focus is on devising strategies to navigate and address the issue. The study identified several strategies that can be employed to manage the implementation of BREEAM certification, including early engagement with stakeholders, clear communication, and the use of experienced consultants.

## 6.1 Future research

This master thesis has offered valuable insight into the economic impact of BREEAM on commercial properties and its influence on the project process. Nevertheless, there is an opportunity to broaden and extend these insights. Firstly, a more comprehensive study could consider adopting a more quantitative approach to investigate the economic impact of BREEAM certification on commercial properties. By combining a quantitative approach with a qualitative approach, future research could provide a more nuanced understanding of the economic impact and project process influence of BREEAM certification on commercial properties. While the current study provides valuable insights into the perceptions and experiences of key stakeholders, a quantitative approach could provide a more detailed analysis of the economic implications, involving analyzing economic data such as rental premiums, occupancy rates, and property values, providing a more comprehensive understanding of the financial benefits and costs associated with BREEAM certification. Additionally, the cost aspect of BREEAM was found to be underexplored, and it is therefore a suggestion for future



research to investigate this aspect more deeply. Especially given the fact that there was evidence from both literature and empirical data that there is a relatively large cost addition to increase the level of certification.

Lastly, due to the time limitations of the study, future research could delve into the long-term effects beyond the anticipated completion of the project in 2024, comprehending a more in-depth understanding of how BREEAM certification influences both the economic impact and project processes over an extended period. In addition, considering the limitations of the qualitative research and the aim of the study, an adoption of a broader scope could be adopted in future research. This could encompass wider geographical research, but also an extensive sample size and an investigation of a more diverse range of commercial property companies to enhance the generalizability of findings. Additionally, it would be beneficial to explore the perspectives of tenants, investors, and future property owners in an investigation, providing a more comprehensive understanding of the different perspectives of the key stakeholders in the construction and real estate industry.



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