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Navn:	Fabian August Andvik og Karine Brevik

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BI Norwegian Business School Oslo, Norway
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Karine Brevik

Karine Brevik

Fabian Andvik

Fabian Andvik

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ABSTRACT

In the complex realm of sustainable housing, consumers are torn between perceiving sustainability as an alluring illusion or a perplexing mystery. Despite widespread environmental concern, individuals frequently choose not sustainable certified alternatives when making purchase decisions. One possible explanation for this gap is the lack of awareness and knowledge that is necessary for the adoption of such practices. The purpose of this paper is to cast light on the true nature of how consumers perceive and comprehend the concept of sustainability and the consumers perspectives on sustainable certified home purchase situations. The current study uses in-depth interviews to uncover the consumer perspectives in the housing market of Oslo, Norway. The results are discussed based on attitudes toward sustainability, the significance of sustainable certifications to consumers, perceived performance of housing operators, and consumers' willingness to pay for sustainable certified residences. Despite a notable lack of consumer awareness, the study findings highlight a significant recognition of the impact of sustainability certification on purchasing decisions. Notably, socio-demographic factors, particularly age, emerge as determinants of consumer interest in sustainability certification. However, when confronted with tradeoffs, preferences for sustainable certified homes shift towards conventional attributes. This phenomenon can be attributed to inadequate understanding, technical complexity, and a lack of standardization, which act as barriers to the adoption of sustainability certified residences. Participants in all cases, however, indicated a willingness to pay prices comparable to current market prices for sustainable certified homes. Implications and limitations of the findings are then discussed.

1.0 INTRODUCTION

Imagine a buffet table with delicious food. As you consider the possibilities, a little voice urges you to choose healthy, sustainable selections. Yet, as your eyes meander, you become aware of the enticing appeal of decadent delights, which beckon you with their flavors and familiarity. At this moment, you are faced with a familiar dilemma – the clash between your desire for instant satisfaction and the nagging awareness of long-term sustainability. As we negotiate the buffet, our choices create our future, weighing the familiar versus the greener route.

Research on the origins of green behavior reveals a complex and challenging relationship between its antecedents and behavioral outcomes. This holds true for both academics and marketers. Additionally, there is a growing imperative to enhance the sustainability of the constructed environment. This is due to its substantial consumption of scarce resources, materials, and energy, as well as its significant contribution to emissions during both the construction and operation phases (Warren-Myers et al., 2018). Globally, residential buildings account for approximately 17% of carbon dioxide emissions and consume 27% of energy. Moreover, 40% of the EU's energy consumption and 36% of greenhouse gas emissions are attributable to buildings, which are primarily the result of construction, utilization, renovation, and demolition (European Commission, 2020). Notably, the building industry contributes to 15% of Norway's emissions (Tekna, 2022).

Sustainable certifications have been developed to facilitate the measurement of sustainability objectives and enable effective communication with consumers (Warren-Myers et al., 2018). These certifications serve as a valuable tool for planners, allowing them to assess projects at an early stage and derive guidelines for achieving sustainable planning goals while enhancing building sustainability. Upon completion, these certifications provide users and operators with easily understandable documentation of the building's sustainable quality. However, consumers' desire for sustainability certifications in the housing sector is limited (Esparon et al., 2013). Consequently, the role of sustainable certifications as a crucial tool for advancing the sustainable housing agenda remains uncertain, as

there is insufficient evidence to either support or reject their effectiveness, as noted by Esparon et al. (2013).

Moreover, certifications serve as a means to identify and designate "responsible" businesses, enabling consumers to make informed and ethical purchasing decisions (Chamorro & Banegil, 2006). Research conducted by Chamorro and Banegil (2006) demonstrates that consumers prioritize their energy costs and maintenance expenses. Consequently, enhancing sustainability and energy efficiency becomes crucial for consumers as it provides a safeguard against escalating energy costs. However, it remains unclear whether consumers are sufficiently aware of or knowledgeable about the attributes associated with sustainable certifications.

A paradox arises as planners, regulators, and investors express enthusiasm for certifications, while consumers display limited interest. To address this gap, the current study aims to examine the effectiveness of sustainable certification from the perspective of consumers when making home purchasing decisions, focusing specifically on prospective and current homeowners in Oslo. Therefore, the primary research question is: *"What is the effectiveness of sustainable certification from the consumer's perspective when buying a home?".*

Further, the study seeks to investigate the following aspects:

1. What is the consumers' level of awareness and knowledge regarding sustainable certified homes?
2. What are consumers' perceptions of the attributes associated with sustainable certification?
3. How are consumers' assessments of housing operators' performance based on the attributes of sustainable certification?

The current research contributes to the existing knowledge on sustainable certifications by examining their significance and performance, thereby providing insights into the specific attributes that may require refinement. By conducting in-depth interviews with Norwegian homeowners and potential buyers, this study aims to shed light on the consumer perspective. According to the findings, most consumers are not willing to pay a premium for sustainable certification of

residences in general. This reluctance may be attributable to a lack of consumer awareness, knowledge, or trust in housing operators regarding the attributes of sustainable certifications. These results align with previous survey studies, which have consistently shown that when individuals purchase a home, they prioritize factors such as location, neighborhood, size, landscape, and design over sustainability considerations (Olaussen et al., 2019). Therefore, it appears that sustainable certifications measures have yet to capture the attention and importance of consumers in the housing market.

The current paper begins by reviewing relevant empirical literature that examines the effectiveness of sustainable certifications, providing a solid foundation for the subsequent discussion. This section helps to inform and enrich the study's findings. The methodology employed is then described in greater detail, outlining the specific approach and data collection method used to gather insights from respondents. This methodological section provides clarity on the study's design and ensures transparency in the research process. The main body of the paper focuses on identifying the housing purchase-relevant attributes that individuals consider essential and their willingness to pay based on the perceived significance of sustainable certification attributes and the perceived performance of housing operators. This section includes an investigation of the data collected through in-depth interviews, exploring consumer perspectives and preferences related to sustainable certifications. Further, the paper concludes by summarizing the key insights gained from the study. This conclusion section provides a concise overview of the findings and implications for marketers, industry leaders, consumers, and policymakers in the housing industry. Finally, limitations are discussed, along with suggestions for future research.

1.1 Background

To attain the EU's 2030 climate and energy targets and the European Green Deal's stated objectives, it is essential to prioritize investments in sustainable initiatives and activities. However, to effectively do so, there is a need for a shared understanding and precise definition of "sustainability". Recognizing this necessity, the action plan for financing sustainable growth called for the development of a common classification system known as the "EU taxonomy" (Finance, n.d.). The

EU taxonomy serves as a classification system that establishes a comprehensive list of economically sustainable practices in relation to the environment. Its primary objective is to support the EU in expanding sustainable investment and facilitating the implementation of the European Green Deal. By providing clear definitions of which economic activities are considered sustainable, the EU taxonomy offers businesses, investors, and policymakers a common language and framework.

The EU taxonomy plays a crucial role in several aspects (Finance, n.d.). Firstly, it provides investors with a sense of security by offering transparent criteria for sustainable investment. This helps protect private investors from misleading claims or "greenwashing" and ensures that their investments align with genuinely sustainable practices. Secondly, the taxonomy assists businesses in adopting more climate-friendly approaches by providing them with clear guidelines and benchmarks for sustainable operations. This enables companies to make informed decisions regarding their strategies and investments. Moreover, the EU taxonomy helps reduce market fragmentation by establishing a unified standard across the EU.

Although both certification and the EU Taxonomy are concerned with environmental sustainability, they serve distinct purposes (Celsia Team, 2023). Sustainable certifications concentrate predominantly on evaluating the environmental performance of buildings, which includes both new construction projects and major renovations of existing structures. In contrast, the EU Taxonomy operates on a broader scale, assessing the environmental sustainability of various economic activities across multiple sectors, including construction (Celsia Team, 2023). Consequently, obtaining a sustainable certification can demonstrate a building's commitment to sustainability and may assist in meeting certain EU Taxonomy requirements.

Furthermore, the housing market operates differently from other markets, such as the market for home appliances, where research has demonstrated the positive influence of labels on consumer decisions (Beerepoot, 2007). Unlike the market for appliances, the housing market is characterized by scarcity and heterogeneity. This implies that households rarely choose between identical products (O'Sullivan, 2007). It is worth noting that most theoretical discussions on the impact of

certification primarily focus on certifications in general or specifically on appliance certifications, rather than sustainable certifications for residences. Therefore, while the influence of labels on consumer decisions has been extensively explored in various contexts, the specific implications of sustainable certifications for residences remain less studied and understood.

The current study contributes to an understanding of how to adapt sustainable certifications to the EU's emission reduction goals for the construction industry based on consumer perspectives (Ries et al., 2009). Furthermore, enhancing knowledge of the perceived importance and performance of sustainable certifications is crucial for three key reasons:

1. Identifying alignment between importance and performance from the consumer's perspective: This enables businesses and marketers to address any discrepancies and realign their strategies accordingly. By understanding consumer perceptions, companies, public policies, and industry leaders can make necessary adjustments to ensure their offerings meet consumer expectations and preferences.
2. Providing guidance to certification providers and businesses: By identifying the attributes that interest or concern consumers, the study helps certification providers and businesses gain valuable insights on specific attributes that attract consumers, providing clear guidance for sustainable certified businesses on how to meet their customers' needs and expectations.
3. Evaluating the divergence between consumer perceptions and essential sustainability reality: While consumer requirements are crucial, it is essential to assess if there are sustainability aspects, as measured by certification schemes, that consumers consider inconsequential but are deemed essential by other stakeholders, such as scientists or protected area administrators. In cases where there is misalignment, it presents an opportunity to educate consumers about the significance of those aspects and their role in achieving sustainability objectives. This highlights the potential need for modifying consumer perspectives rather than altering the certification scheme itself.

2.0 LITERATURE REVIEW

2.1 Green Consumer Behavior

The construction of sustainable structures is regarded as one of the most essential means in the pursuit of a sustainable construction industry (Balderjahn et al., 2013), to attain EU's climate and energy objectives. While improved green technology is frequently cited as a crucial aspect of sustainable buildings, it is also crucial to consider the existing housing stock. As the paradigm of global sustainable development continues to evolve, consumers have become more discerning in their purchasing decisions, especially when it comes to high-involvement products such as homes (Zhang et al., 2018). This change in consumer behavior is a result of a greater awareness of environmental issues and a desire to support sustainable practices. Therefore, it is of the utmost importance to understand the key attributes that substantially influence consumers' purchasing decisions in the context of sustainable certified residences (Zhu et al., 2019).

Attention has been drawn to ethical consumerism, which is characterized by favorable attitudes and conscious consumption of ethical products (Auger et al., 2003). Ethical consumers give precedence to socially responsible products and consider their ethical characteristics when making purchase decisions (Creyer, 1997). Foti and Devine (2019) contend that despite efforts to overcome the intention-behavior gap, individual characteristics and environmental influences frequently impede consumer behavior, making it ambiguous whether a comparable lack of knowledge exists in housing purchase decisions.

Foti and Devine (2019) revealed findings that present relationships among the driving factors that were identified by realtors and consumers in the sustainable housing market. Further, the authors identified financial risk as a barrier that prevent consumers from purchasing high-involvement ethical products. Uncertainty regarding investment return is identified as one of the obstacles preventing consumers from purchasing ethical products, and this uncertainty has an impact on initial investments. Due to a dearth of knowledge and training among real estate agents, the inability to reduce investment return uncertainty through information contributes to the intention-behavior gap (Foti & Devine, 2019). However, there

appears to be a void in the research concerning the standardization of sustainable property measures and sustainable education for real estate agents. In the absence of standardized measures, accurately assessing and comparing sustainable certifications may be difficult, potentially undermining their credibility and impact in the housing market.

Furthermore, a lack of sustainable education among real estate agents calls into question their ability to effectively promote and communicate the potential benefits of sustainable certified properties to potential buyers. Without the presence and influence of a real estate agent, this paper intends to address this lack of knowledge by investigating consumers' awareness and knowledge of sustainability and sustainable residences certifications, as well as evaluating the effectiveness of certifications from the consumer's perspective when purchasing a home.

Furthermore, the current sustainable certification system in Norway is solely based on a label to demonstrate home energy efficiency (Amecke, 2012). However, concerns remain about the effectiveness of this approach in communicating energy efficiency information, particularly in terms of the cost implications for potential buyers. Despite economic theory suggesting that consumers tend to be more price-sensitive with larger expenditure items (McTaggart et al., 2015), there remains uncertainty about whether incorporating the financial implications of energy efficiency would genuinely enhance the relevance of sustainable certification to purchasing decisions.

Notably, consumers in the UK generally believe that the current sustainability certification system is ineffective (Lainè, 2011). The results of an online questionnaire revealed that 18% of the sample used certification as part of the negotiation process. However, the study does not consider the costs associated with a sustainable certified home. Financial implications, such as the expected energy cost savings or potential return on investment, may play a significant role in consumers' decision-making processes. Consequently, the presence of financial considerations could potentially impede consumer evaluation and serve as barriers to the widespread adoption of sustainable certification.

Furthermore, the findings of Olaussen et al. (2019) present a challenge to previous studies that reported a positive price premium associated with sustainable certifications. Their research indicated that the energy designation did not lead to a premium price, suggesting a disparity in findings that could be attributed to methodological design rather than reflecting the true impact of sustainable certifications. One possible bias is confirmation bias, where researchers' pre-existing beliefs or expectations about the impact of sustainable certifications unintentionally influenced their choices of variables, sample selection, and data analysis. These biases could have contributed to the previously reported positive price premiums, which may not accurately reflect the actual impact of sustainable certifications.

It is important to consider an alternative perspective regarding the impact of sustainable certification on energy prices in Oslo, as suggested by Olaussen et al. (2019). The authors highlight the evolution of energy prices in the city, which reveals a different narrative. According to their observations, the prices initially increased, peaked in 2010, and subsequently declined. Interestingly, the implementation of sustainable certification in Norway also took place in 2010. This temporal coincidence raises the possibility that the post-label period, characterized by reduced energy prices, may have offset the potential price premium that might be associated with the implementation of such sustainable certification. These findings suggest that other factors, such as changes in energy market dynamics, may have influenced the observed trends in energy prices, thereby questioning the direct causal relationship between sustainable certification and premium pricing.

The aim of this research is to contribute to the existing literature by providing up-to-date findings regarding the attributes that people perceive as important in a home purchase situation. Additionally, the paper assesses the extent to which the sustainability certification aligns with consumers' financial considerations by investigating consumers' willingness to pay and the perceived performance of housing operators. To address these concerns, this research will comprehensively examine the clarity and comprehensibility of sustainable certifications from the consumers' perspective. This investigation provides valuable insights for policymakers, industry leaders, consumers, and researchers seeking to comprehend

the complex dynamics between sustainable certifications, consumer preferences, and housing transaction prices.

2.2 Green Attribute Tradeoffs

According to the theory of diffusion, innovations with greater advantages over established products are anticipated to be adopted more rapidly and broadly (Rogers, 1995). While previous research has supported this hypothesis, it frequently ignores the existence of negatively correlated attributes in sustainable residences, where sustainability certified homes may sacrifice other traditional features. Despite the pervasive public interest in environmental protection, green products are superior to brown products in terms of price, quality, and performance, and will likely be chosen by the overwhelming majority of consumers (Olson, 2013). However, in order to comprehend why average consumers frequently choose brown alternatives, it is essential to investigate the impact of green attribute tradeoffs (Peattie, 1999).

Although research has investigated the relationship between green and conventional product attributes, no empirical study has examined the impact of negative attribute correlation on sustainability certified homes. However, studies conducted in other domains have shown that choice sets with negative attribute correlations contribute to an imbalance in the predictive accuracy of multiattribute models, making it impossible for consumers to achieve their preferred levels across all attributes (Newman, 1977; Olson & Widing, 2002). In such cases, consumers may choose a compromise option with lower overall utility to prevent the undesirable value of a negatively correlated attribute in their preferred option (Simonson, 1993). Even among environmentally conscientious consumers, there is a tendency to avoid low attribute scores frequently associated with the greenest options, according to prior research (Young et al., 2009).

Sustainable certified residences are anticipated to offer advantages in conventional attributes over non-certified residences, compensating for their potential disadvantages, in order to obtain broader adoption beyond green consumers (Pujari et al., 2003). Therefore, average consumers are likely to favor green alternatives when tradeoffs are not considered but may choose less-green products when

tradeoffs are acknowledged in order to prevent low values in negatively correlated conventional attributes. Lack of comprehensive information regarding the cost reductions associated with these features may impede understanding of sustainability ratings in residential development (Foti & Devine, 2019). This lack of information may have hindered the decision-making process, particularly in high-stakes domains where financial risk, pricing, and investment return uncertainties are major concerns. Thus, the asserted attributes of sustainable certified residences, such as lower operating costs and an enhanced internal environment, may not always be realized. Variations in actual cost savings and comfort enhancements can result from residence design, location, and individual utilization patterns, resulting in benefits that are not as substantial or consistent as advertised.

Existing research, which relies primarily on quantitative methods, has limitations that necessitate a more in-depth investigation to completely comprehend the complex dynamics of consumer preferences and decision-making regarding sustainable certified residences. Using qualitative methodologies, our study provides a more thorough and holistic comprehension of the attitude-behavior gap, the green attribute tradeoffs, and the negatively correlated attributes involved in consumers' purchase decisions of sustainable certified homes. This method allows us to delve deeper into the fundamental motivations, preferences, and decision-making processes, which quantitative methods may not fully convey.

2.3 Awareness and Knowledge of Sustainable Certified Homes

Pitt and Sherry (2014) identified a lack of consumer participation and a reluctance to pay as obstacles to the success of these certifications. However, their study did not involve actual consumers but rather relied on the perspectives of other construction process stakeholders. Important insights into consumer attitudes and behaviors regarding sustainability and energy efficiency may have been neglected by this approach.

Furthermore, relying on secondary sources of information may introduce potential biases and assumptions regarding consumer behavior. Consequently, the study's credibility and applicability to the target consumer group may be compromised.

Absence of consumer input makes it difficult to determine the true reasons for their limited engagement and propensity to invest in sustainability and energy efficiency opportunities by ignoring essential factors such as personal values, beliefs, and motivations.

Quantitative research examining consumer demand in sustainability has highlighted the potential influence of knowledge, education, and awareness on promoting participation in sustainability opportunities (Warren-Myers et al., 2012). The findings from their impact study conducted in Germany, indicated that sustainable certification served as a catalyst for 40% of residence owners' renovation activities. While the study provided valuable insights into the potential influence of sustainable certification, its small sample size of fewer than 100 households could be acknowledged as a limitation. This small sample size raises concerns about the generalizability of the results and the ability to capture the diverse array of consumer attitudes and behaviors regarding sustainability. Moreover, the current in-depth qualitative analysis study offers advantages over Warren-Myers's (2017) study in terms of comprehending consumer preferences in relation to sustainability. While the Warren-Myers study highlighted purchasers' desire for increased sustainability and energy efficiency, it focused predominantly on the obstacles they face, such as a lack of communication with architects, insufficient information, and limited options.

Furthermore, the challenges faced by sustainable certifications in gaining acceptability among homeowners are evident in another study. Murphy (2014) found that 5% of the sample expressed a negative opinion of sustainable certifications, which served as a deterrent for pursuing sustainable certification. This highlights the ongoing difficulties in obtaining widespread acceptance and adoption of certifications among homeowners. This finding aligns with the paradoxical nature of previous research in this field. On one hand, studies such as Brounen and Kok (2010) have indicated that homes with higher energy ratings tend to command higher market values, suggesting a positive association between energy efficiency and property value. However, other studies, including Murphy (2019) and Lainè (2011), have shown that few homeowners actively utilize

sustainable certifications during the transaction process, casting doubt on the practical impact of certifications on real estate transactions.

This discrepancy raises questions about the effectiveness of sustainable certifications in the eyes of homeowners. Despite prospective buyers generally being unlikely to negotiate based on sustainability certifications, this paper examines the underlying reasons for the limited utilization and skepticism surrounding these certifications. By engaging directly with consumers and delving deeper into their perspectives, values, and motivations, the study provides a nuanced and comprehensive understanding of consumer awareness and knowledge of sustainability certifications, leading to the following research question:

Research question 1*: "What is the consumers' level of awareness and knowledge regarding sustainable certified homes?"*

2.4 Perceived Significance of Sustainability Certification Attributes

A study by Amecke (2012) reveals that sustainable certifications have a moderate influence on assisting purchasers in incorporating energy efficiency into their purchasing decisions. However, consumers tend to prioritize observable price factors over sustainability certifications (Lutzkendorf & Speer, 2005). This disparity suggests that energy efficiency advancements are not fully reflected in higher home selling prices, resulting in sellers having insufficient incentives to invest in energy efficiency as a product quality (Sanstad & Howarth, 1994). It implies that there may be limitations in how sustainable certifications are perceived and valued by consumers.

Research conducted by Amecke (2012) indicates that 44% of respondents considered sustainable certifications to be reliable in terms of consumer trust and relevance. This lack of confidence can be attributed to the novelty and scarcity of sustainable certification as an informational tool. Similarly, Lainé's (2011) study in the UK revealed that the majority of respondents did not rely on the information provided by the sustainable certification when making purchasing decisions, despite perceiving the certification to be obvious. These findings suggest that the

low relevance of certifications and the lack of confidence in their information could be associated with their limited market penetration.

According to Olson (2013) and Amecke (2012) research, the presence of value-action disparities in consumer behavior toward green products creates additional barriers for the adoption of sustainable certifications. Despite consumers' positive attitudes toward green technologies and recognition of their economic benefits, their actual purchasing behavior frequently fails to match these attitudes. According to Olson's (2013) research, other factors like product size and effectiveness seem to overshadow the appeal of green products in consumer decision-making processes. As a result, efforts to reduce compromises and tradeoffs in other aspects of housing may increase the appeal and desirability of sustainable certifications.

While Amecke's (2012) study provides valuable insights into private purchasing decisions for extant structures in Germany, its limited scope prevents findings from being generalized to other nations with distinct market structures and sustainable certification systems. Moreover, previous studies have indicated that consumers value certification and perceive it to have positive environmental and social effects. However, the specific importance of different sustainable certification attributes in a housing context has not been thoroughly examined (Chafe, 2007; Esparon et al., 2013; Fairweather et al., 2005). As consumer decisions are influenced by various attributes of a product, extending beyond its physical features (Lancaster, 1966), the current study extends on previous research by providing a comprehensive understanding of consumer perceptions of the attributes associated with sustainable certification. Thus, this leads to the following research question:

Research question 2: *"What are consumers' perceptions of the attributes associated with sustainable certification?"*

2.5 Consumers' Perceived Performance of Housing Operators

When assessing customer satisfaction with a product's attributes, two critical factors should be considered: the attribute's importance to the consumer and the consumer's perception of the operator's performance on that attribute (Martilla & James, 1977). Foti and Devine (2019) argue that a lack of trust in real estate agents

may contribute to a lack of confidence in sustainable certifications. However, the current scarcity of information available to agents creates an environment in which the consumer-agent relationship is unsettling. This barrier is exacerbated by the failure to address common misconceptions and misunderstandings about sustainable certifications (Foti & Devine, 2019).

According to Foti and Devine (2019), the pivotal role of real estate agents in the home-buying process is often hindered by their limited knowledge and understanding of sustainable characteristics. This deficiency prevents agents from providing essential information that could address consumer dissonance effectively (Foti & Devine, 2019). Further, this problem is exacerbated by the financial risks associated with high-risk purchases, which may discourage consumers from investing in properties with sustainable certification attributes. Because real estate agents frequently serve as the public face of housing operators when interacting with consumers, a lack of trust in them may reflect broader concerns about the trustworthiness and performance of housing operators.

In addition to recognizing the trust issues with real estate agents, the current study investigates the broader potential implications of the reliability and performance of housing operators. The consumers assessments of housing operators contribute to a deeper comprehension of the factors that influence consumer perceptions in the context of sustainable housing, leading to the following research question:

Research question 3: *"How are consumers' assessments of housing operators' performance based on the attributes of sustainable certification?"*

3.0 METHODOLOGY

3.1 Context

Among the numerous sustainability certifications available in Norway, including Svanemerket, BREEAM, ISO 14001, Energy labeling (A-G), and Miljøfyrtårn, BREEAM certification is the most prevalent across all construction categories (Ryghaug & Sørensen, 2009). With a global history dating back to 1990, approximately 600,000 buildings have received BREEAM certification worldwide. In Norway, there are currently 241 certified sustainable buildings and approximately 891 registered projects (Sørensen, 2023). As of 2023, Statistics Norway reports that a total of 1,592,339 residential buildings have been constructed. Thus, the ratio of sustainable certified buildings to the total number of residential buildings and projects is negligible, accounting for 0.071%. In other words, sustainable certifications represent a small portion of residential construction in Norway at the present time. Although this indicates a positive trend in terms of increased adoption of sustainable certifications, it also demonstrates that certification has not yet become ubiquitous in the residential construction industry as a whole.

In addition, the general public's low awareness and comprehension of various sustainability certifications for residences emphasizes the need to investigate the efficacy of certification from the consumers' perspective (Brand, 2019). Using sustainable certification as a collective term for the wide variety of Norwegian certifications, the current study seeks to assess the degree to which sustainability certification delivers the intended attributes. Notably, these sustainability certifications are project-specific, concentrating on satisfying specific criteria for each housing project as opposed to being applicable to the entire business or operator.

3.2 Research Design and Method

The current study employs predominantly qualitative research design and semi-structured interview to investigate the effectiveness of sustainability certification in the home sector (Ries et al., 2009). While previous research has relied heavily on

statistical methods, this study aims to supplement previous quantification methods. As suggested by Olaussen et al. (2019), in-depth interviews are necessary for elucidating consumers' perspectives on sustainability certification disparities.

To capture the intricate structure of consumers' perceptions regarding the efficacy of sustainable residence certification, a qualitative approach is ideally adapted. This methodology enables for the generation of robust and nuanced data by engaging in direct interaction with participants and drawing on a variety of informational sources (Eisenhardt & Graebner, 2007). In order to answer the study's research question, the method for evaluating the efficacy of sustainability certification consisted of interviewing participants to ascertain their "stated preferences".

3.3 Sample

This study's sample was designed to capture a variety of perspectives and insights regarding the research questions at hand. Using email invitations, respondents were recruited through a voluntary participation process. Participants were chosen based on predetermined criteria to assure their suitability for addressing the research objectives. As a result, one group of interviewees consisted of prospective homeowners residing in Oslo with at least a high school diploma, while another group consisted of current homeowners who met the same criteria. Thus, the sample sought to provide a holistic comprehension of the topic by including consumers of different ages, genders, educational levels, and occupations.

Twenty respondents were selected for in-depth interviews in order to capture high-quality data and obtain a pre- and post-purchase consumer perspective. The interviews took place in Oslo between March and May of 2023. Further, the interviews were conducted in either a digital or physical setting to facilitate effective communication and close interactions with the participants. The interviews were conducted in either the local language (Norwegian) or the international language (English) to ensure that all respondents could completely comprehend and respond to the queries.

3.4 Structure of Questionnaire

This study's interview guide followed a structured format to ensure consistency and thoroughness in data collection. The guide was separated into three sections: Attitudes Toward Sustainability, Sustainability Certification, and Housing Preferences and Demographics.

In Part 1, the interview began with a focus on consumer attitudes toward sustainability, without disclosing the purpose of the study, inspired by Galletta (2013). This method intended to record the initial thoughts and preferences of participants in order to preserve the validity of their responses. The section's queries focused on the perceived significance of home attributes to consumers and their knowledge of sustainability. Participants were asked to rank the five most important elements they consider when making a residence purchase, followed by questions regarding what sustainability means to them and its impact on their home purchase decisions.

Part 2 focused specifically on sustainability certification. The participants were questioned what housing sustainability certifications they are aware of and specific attributes associated with a sustainability certified home. In addition, probes were used to compare the efficacy of sustainable certified and non-certified residences based on their responses. The next question investigated participants' perceptions of housing operators based on the attributes enumerated. Finally, participants were asked how much they expected and were willing to pay for a sustainable certified home, including adjustments to an index value, approval of price differences, and their acceptable maximum price.

Part 3 was devoted to housing preferences and demographic data. Participants were asked about their preferable location for purchasing a home, whether they bought or intend to purchase a home, and the type of residence of interest. Further, participants were asked about their age, level of education, and job title/position.

3.5 Categorizing Data and Ensuring Scientific Rigor

After conducting the interviews, the recorded audio was transcribed, and an inductive analysis method was then applied to the transcripts (Azungah, 2018). Participants' responses were divided into three major thematic categories: awareness and knowledge of sustainability, attitude toward sustainability certifications and housing operator performance, and consumers' willingness to pay. This categorization enabled a systematic organization of the data, which facilitates comparison with existing theoretical and empirical literature and enables the identification of new insights that contribute to the existing corpus of knowledge (Riege, 2003).

To ensure the scientific rigor of qualitative data analysis, numerous quality procedures were implemented. Internal and external validity, construct validity, and reliability were the objectives of these procedures (Yin, 1994). Before conducting in-depth interviews, specialists from Bonava and SINTEF were consulted, including the marketing manager, the health, safety, and sustainability manager at Bonava, and two SINTEF researchers with expertise in relevant research topics. These conversations enhanced the interview guide's dependability and validity. To ensure internal and construct validity, the authors independently transcribed and categorized the interviews and then cross-checked their findings for consistency and accuracy. As suggested by Riege (2003), external validity was determined by comparing the interview results to the existing literature. Using a well-structured research process further ensured reliability and construct validity, as highlighted by Seuring and Müller (2008).

Utilizing inquiries during interviews was an effective method for guiding respondents and eliciting more in-depth perspectives. Participants were encouraged to delve deeper into their thoughts and experiences regarding sustainable certifications through the use of questions designed to steer the conversation toward specific areas of interest. These inquiries served as probes, enabling collection of more thorough and nuanced data. In certain instances, respondents were able to provide insightful responses without the need for extensive questioning. As they spontaneously shared their perspectives and experiences, their knowledge and

comprehension of sustainability certifications were clear. This demonstrates the diversity of the sample's participants' knowledge levels and the range of their opinions. The presence of both prompted and unprompted responses enhanced the overall data collection process, resulting in a more complete understanding of consumer attitudes toward sustainability certifications.

4.0 RESULTS

4.1 Sample Characteristics

According to the findings of the study, prospective and current homeowners have different perceptions of the effectiveness of sustainability certification, which is influenced by demographic factors. One considerable factor is age, as our sample includes respondents ranging in age from 23 to 82 years old. Notably, respondents between the ages of 23 and 30, as well as those between the ages of 70 and 80, prefer apartment living, whereas those between the ages of 30 and 70 prefer houses. When participants were asked about their preferred areas for purchasing a home, the majority of the sample indicated the Oslo area. This response was consistent among both consumers who had already purchased a home and those who were planning to do so. However, it is worth noting that older respondents placed greater emphasis on the availability of a garden and expressed a preference for locations outside of Oslo.

Furthermore, there are few differences in the effectiveness of sustainability certification based on gender, location, or job title. Previous research indicates that those with a higher level of education have less trouble comprehending ecological topics than those with a lower level of education (Paul et al., 2016). However, the current study reveals minor differences in sustainability certification awareness and knowledge based on level of education. Moreover, the current study's findings contradict Chan's (2001) results that minors do experience complexity when making sustainability-related decisions. Rather, the minors are shown to be more knowledgeable about the subject.

4.2 Sustainability Awareness and Knowledge

Research question 1: *What is the consumers' level of awareness and knowledge regarding sustainable certified homes?*

One respondent elaborated: "*When it comes to purchasing a home, my primary considerations are location, price, and quality".* When compared to other attributes, the overall results on consumers' perceived importance of attributes considered when buying a home revealed that respondents place a low value on sustainable certification. Consequently, 15% of the participants consider sustainability certification to be a top-five priority. On the other hand, all participants mention location, price, and quality as important considerations without probes.

According to a respondent from the current homeowner group*: "I feel the location should be handy for my daily commute and close to important facilities".* A notable distinction emerges between the current homeowner group and the prospective homeowner group in terms of attribute emphasis. The current homeowner group places greater importance on attributes such as neighbors, recent renovations, and size, suggesting a focus on immediate and tangible aspects of the property. For example, one respondent answered: "*It's not that I don't appreciate sustainability – rather, when it comes to finding a home, I prioritize other criteria".* In contrast, the prospective homeowner group emphasizes the type of housing and aesthetics, indicating a preference for features that align with their future vision of a home.

These findings raise questions about the comparability of certification with more traditional attributes that consumers value when making a home purchase decision. The emphasis on "visible" factors suggests that consumers prioritize immediate practical considerations and tangible aspects of a property. This is consistent with the findings of Murphy (2014), which suggest that sustainable certifications will not have the intended effect even if they are thoroughly implemented. However, it is important to question whether sustainability certification can be equated with or directly compared to these traditional attributes in terms of consumer valuation.

One respondent stated: "*Sustainability is a relatively new term for me, so I don't know too much about it*". When most respondents heard the term "sustainable housing", the first thing that came to mind, without probes, was the environmentally friendly aspect, the fact that the residence is sustainable, and the use of environmentally friendly materials. 40% of the sample also mentioned that the home is energy-efficient but does not go into detail about what that entails. When asked, the majority of people said: "*The residence retains heat better, which means you save money on energy costs over time*". There appears to be a lack of knowledge about which characteristics are associated with sustainable housing, as evidenced by the majority of consumers believing it is difficult to determine whether a residence is sustainable.

Similarly, prospective and current homeowners stated: "*Sustainability influences/influenced when I consider/purchase a residence".* Interestingly, the study reveals that a significant majority of consumers (90%) claims that sustainability influences their housing choices to some extent. However, considering the limited knowledge demonstrated regarding sustainability certification, it raises questions about the credibility of this statement in actual purchase decisions. The findings are consistent with earlier research by Heeren et al. (2016), which indicates a relationship between environmental knowledge and sustainable behavior. The lack of knowledge regarding sustainability certification suggests that consumers may have a limited grasp of the practical implications and attributes associated with sustainable housing. It is possible that consumers may have a general perception that sustainability is important without fully comprehending the specific criteria or certifications that define sustainable residences. Without a solid understanding of sustainability certification and its underlying principles, it becomes questionable whether this stated influence on housing choices truly translates into informed decision-making during the purchase process.

4.3 Attitudes Toward Sustainability Certifications

Research question 2: *What are consumers' perceptions of the attributes associated with sustainable certification?*

According to one respondent: "*I expect that sustainable certification primarily means that the residence provides better heat and thus does not use the same amount of energy as a traditional home*". Without probes, the majority of respondents struggled to name any certification attributes. The findings reveal that a considerable number of participants lack the ability to discern the fundamental differences between sustainable certified homes and non-certified ones. This aligns with the findings of Ko (2005), suggesting a general consumer unawareness of the multifaceted attributes that constitute sustainability certification. While some participants mention aspects such as energy consumption, improved insulation, and heating capabilities, there is a notable absence of comprehensive understanding.

According to one respondent: "*If sustainable materials are used, the quality will most likely increase, but at the expense of appearance*". This can be interpreted as consumers believing they must make tradeoffs to obtain the potential benefits of a sustainable certified residence. These outcomes are consistent with the research of Olson (2013), which highlights that consumers exhibit strong preferences for green products when tradeoffs are not salient but show a notable shift when actual attribute tradeoffs are considered. This suggests that consumers may be more hesitant to choose sustainable options when they perceive significant sacrifices.

According to one older homeowner: "*My decision to purchase a property is not initially influenced by certification or sustainability because I do not believe it affects my living situation*". The elder homeowner group self-identified as less green, which makes sense given their subsequent lack of interest in sustainability certifications. This finding aligns with previous research, such as Peattie (1999), which suggests that average consumers often prioritize conventional alternatives over green attributes when tradeoffs have a low influence.

The current study reveals a notable distinction between different age groups. The elder homeowner group's lack of interest in sustainability certifications, supports the notion that individuals with less inclination towards green behavior may exhibit lower interest in sustainability certifications. On the other hand, the majority of younger prospective homebuyers, who self-identified as green respondents, demonstrated greater knowledge and placed a higher value on certifications. This finding suggests a relationship between young consumers' green behavior and their interest in sustainability certifications. Previous research by Peattie and Peattie (2009) indicates that green consumers tend to align their actions with their green attitudes by engaging in environmentally friendly behaviors. Based on this understanding and findings of our study, it is reasonable to infer that young prospective homebuyers are more inclined to prioritize and consider purchasing a residence with sustainability certification.

4.4 Perceived Performance of Housing Operators

Research question 3: *How are consumers' assessments of housing operators' performance based on the attributes of sustainable certification?*

Another respondent stated: "*I was unaware there were sustainable certification operators for residences".* Respondents demonstrate a significant dearth of awareness and knowledge regarding operators that implement sustainable certifications. Further, the majority of participants had difficulty naming specific certifications in the absence of probes, indicating a lack of familiarity with the concept. This may be attributable to respondents' limited experience in the housing context and their infrequent exposure to sustainable certification and housing operators in complex purchasing situations. However, when prompted, Svanemerket was the most readily recognized certification, possibly due to its application beyond residential properties.

Moreover, some respondents indicated that they have a favorable opinion of certain housing operators and choose a home based on its reputation and brand perception. One respondent explained: "*Because of Selvaag's strong reputation, I really want to acquire an apartment from them. I wasn't sure if they built flats with sustainable certification or not*". The respondent elaborated that a housing operator with a

positive reputation is perceived as dependable, trustworthy, and able to provide high-quality residences. This positive perception might imbue homebuyers with confidence, mitigating their concerns regarding potential risks and unpredictability associated with the home-buying process. Consequently, the prevalence or absence of sustainable certification was not considered.

Furthermore, when asked how housing operators of sustainable certifications were perceived to be performing, prospective and current homeowners responded differently. One current homeowner said: ”*It is difficult for me to judge how the operators behave in the market when I do not know them or the certifications*”. Consequently, existing homeowners lacked specific expectations. Similar to our findings, Sánchez-Bravo et al. (2020) discovered that interest in sustainability declines with age. Despite respondents' lack of awareness of sustainable certifications, prospective younger homeowners had higher expectations based on the performance of housing operators. One prospective respondent stated that: “*With such a large investment, it is critical that the housing operator performs in a sustainable manner”*. The findings support previous research by Franzen and Vogl (2013), which suggests that interest in sustainability is influenced by socio-demographic factors. Younger people may be more interested than older people because they have grown up in a time when they have had more exposure to sustainability issues. According to Sánchez-Bravo et al. (2020), age is one of the main factors that account for differences in consumer concerns about sustainability. As a result, it is reasonable that young people claim to be more interested in sustainable certified homes, despite the fact that they appear to be unaware of what sustainability certifications entail.

It is worth considering the viewpoint raised by one respondent who expressed concern about the durability of sustainable certified residences compared to non-certified residences. According to the respondent: “*incorporating materials like concrete in addition to sustainable wood would enhance the durability of the structure*”. This perspective sheds light on a potential skepticism regarding the quality of sustainable certification and its implications for trust in housing operators. This finding aligns with research conducted by Foti and Devine (2019), which suggests that a lack of trust in real estate agents may contribute to a lack of

confidence in sustainable certifications. It indicates that some individuals may question the tradeoffs involved in sustainable certification, particularly when it comes to long-term durability. It is therefore reasonable to assume that when individuals perceive a lack of durability in sustainable certified residences, it can erode their confidence in the housing operators responsible for constructing and maintaining these properties. Hence, low trust in housing operators can stem from a variety of factors, including concerns about their expertise in sustainable construction practices, their adherence to quality standards, and their commitment to long-term durability.

4.5 Consumers' Willingness to pay

In general, the majority of respondents struggled to place a value on a sustainability certified home. One respondent stated: "*It is difficult to value sustainability certification because I am unaware of its short and long-term benefits or consequences*". When the respondents were asked about their intentions to purchase a home (regardless of whether they see a used or newly built home as more likely), 20% said they are willing to pay more (5-15%) for a sustainably certified home. This contradicts the findings of Pitt and Sherry (2014), which revealed that the majority are unwilling to pay extra for sustainable certified attributes. Moreover, young individuals have the highest propensity to pay (25-34 years). The fact that sustainable certified residences account for 0.071% of total residential buildings, far less than 20%, indicates a market opportunity among younger consumers. This finding is consistent with Olson (2013), who claims that consumers are aware that green products carry a price premium. However, a greater proportion of the elderly (55-64 years and over 65 years) do not wish to pay more. 10% of those aged 55-64 and 5% of those aged 65 and older are willing to pay extra.

When asked specifically how much more the respondents are willing to pay for a residence to be sustainable certified, 80% of respondents say they are unwilling to pay any additional amount. For example, one respondent stated she anticipates paying an average of 4.5 MNOK for the home of her dreams. Consequently, she is willing to pay an additional NOK 176,000, or 3.9% of the anticipated purchase price, for a residence to be sustainable certified.

Due to the heterogeneity of residents, it is challenging to compare how much more sustainable certified homes cost versus comparable non-certified homes. According to three different studies on the impact of certifications on home sales prices, homes with sustainability certifications are sold at price premiums ranging from 2.1% to 9.6% higher than non-certified homes (Southern Energy Management, 2017). Variations in willingness to pay could be attributed to various entities, locations, and researchers. The majority of the respondents in the current study indicated paying a premium for sustainable certification between 5 and 15%. This indicates that both younger and older consumers have a consistent and reasonable preference for sustainable certified residences over market prices. These findings are in line with Warren-Myers (2017), which suggests that consumers are willing to pay more for energy-efficient features. However, comparing the stated price (5-15%) to actual market prices (2.1-9.6%) indicates that consumers are willing to pay market prices or more for sustainable certification. Thus, the barrier to low sustainable certified home adoption might not be a higher selling price.

While there were homeowners who expressed a willingness to pay more for certification, their motivations varied. Two homeowners mentioned the potential cost savings on ongoing electricity expenses as a reason for paying more for a sustainable certified home. They likely perceive the energy efficiency associated with sustainable certification as a means to reduce their long-term utility costs, making the investment worthwhile. Another perspective is the belief that purchasing a sustainable certified home is an investment that can potentially increase the property's value in the future. However, they did not provide a specific additional amount they would be willing to pay for certification. This highlights a potential uncertainty or lack of clarity among some homeowners regarding the monetary value they associate with sustainability certification.

Another respondent who intended to purchase a residence added: "*I want a sustainable certified home, but it depends on the purchase costs as the price of residences is already so high*". The respondent's statement emphasizes a valid concern regarding the affordability of sustainability certified homes, which may be more expensive than non-certified homes. This concern raises critical

considerations regarding the financial viability of purchasing a certified sustainable home carrying a price premium.

It is worth noting that the respondents in the current study represent a younger age group than the average age of first-time homebuyers in Norway, which is 28 years (NEF, 2017). Given their younger age range of 23 to 30 years, it is possible that these individuals may face limitations in terms of their financial means and ability to afford a sustainable certified residence carrying a price premium. Affordability is a critical aspect to consider when it comes to the adoption of sustainable residences, as high prices can pose a barrier to entry for many individuals, particularly younger buyers who may be in the early stages of their careers and have limited savings.

Considering the average monthly salary for 25-39-year-olds in Norway, which stands at 47,170 NOK, the annual income amounts to 566,000 NOK (Statistisk sentralbyrå, 2023). Taking into account the previous example of the anticipated price of a sustainable certified residence at 4,676 MNOK and the consumer's reliance on a loan for the purchase, it becomes apparent that the individual possesses no equity. Under such circumstances, the equity capital requirement amounts to 1,823,640 NOK, resulting in a monthly borrowing cost of 15,662 NOK.

In comparison, if we eliminate the 3.9% increase attributed to certification, the equity requirement for the same property (priced at 4,5 MNOK) would be 1,755,000 MNOK, with a borrowing cost of 15,075 NOK per month. Consequently, the difference in loan costs amounts to 3.7%, which may be deemed reasonable and unlikely to serve as a significant barrier for potential younger buyers earning the average monthly salary. This analysis serves to underscore the notion that the premium pricing of sustainably certified homes is not the sole factor contributing to their limited market share.

5.0 DISCUSSION AND CONCLUSION

5.1 Attitude Toward Sustainability

In spite of the common belief that providing consumers with more information about sustainability will increase their awareness and adoption of sustainable housing practices, the reality is more complex. The decision-making process of consumers is influenced by a variety of factors beyond information alone. According to this study, respondents placed greater emphasis on traditional housing characteristics such as location, price, and housing type. This suggests that consumers prioritize immediate and tangible benefits over considerations of long-term sustainability. Consequently, a dearth of interest or motivation to prioritize sustainability may overshadow the effect of providing information.

Secondly, the complexity and abstraction of the concept of sustainability can present difficulties for consumers. Multiple criteria, including energy efficiency, resource conservation, and environmental impact, are included in sustainable certification. Understanding and evaluating these factors can be difficult for consumers, especially if they lack the knowledge or experience to assess the significance and characteristics of sustainable housing. Therefore, information saturation or a lack of clarity in communicating the relevance of sustainability can hinder consumers' ability to completely comprehend and value its importance.

In addition, social and cultural norms might influence consumer behavior, which may not align with sustainable practices. Peer influence, societal expectations, and prevalent housing market norms can influence consumer preferences and decisions. If sustainability is not broadly valued or recognized in a given social context, individuals may be less inclined to prioritize it, regardless of the quantity of available information.

It is evident that the newer generation has a greater awareness and understanding of the concept of sustainability, whereas the older generation tends to prioritize and emphasize characteristics that correspond with their existing comprehension, excluding sustainability considerations. This disparity in viewpoints may be

attributable to the increased emphasis on sustainability in educational institutions such as schools and universities over the past ten years. However, as noted by Heeren et al. (2016), merely educating students about sustainability may not be enough to influence their behavior.

In addition to the previously mentioned factors, psychological and emotional factors also influence the attitudes of consumers toward sustainability in the housing market. For instance, consumers may exhibit "status quo bias", in which they prefer to stay with familiar housing options rather than adopting sustainable alternatives. Even if a change is viewed as beneficial, it may be met with resistance due to the familiarity and comfort of the status quo. In addition, cognitive fallacies, such as the "greenwashing effect", may influence consumers' perceptions of the efficacy and impact of sustainable certifications (Nadeau et al., 2019). The proliferation of green marketing claims and varying levels of industry transparency can create skepticism and confusion among consumers.

5.2 The Significance of Sustainable Certifications to Consumers

The observed low perceived significance of sustainable certifications reflects the complexity of consumer perceptions and decision-making processes regarding sustainability in the housing market. This dearth of awareness and recognition may contribute to the lack of trust in housing operators performance in terms of sustainable certifications. As a result, consumers may be less likely to prioritize sustainable certifications or consider them influential factors in their home-purchasing decisions.

First, a dearth of consumer knowledge and comprehension of the specific criteria and attributes associated with sustainable certifications may contribute to their diminished perceived importance. Inadequate knowledge and familiarity with these certifications may cause consumers to misunderstand their value in terms of energy savings, environmental impact, and possible cost savings.

Second, the complexity and technicality of sustainable certifications can hinder consumer understanding. Certifications may use unfamiliar terminology, methodologies, and metrics that are difficult for consumers to interpret and

evaluate. Non-specialists may find energy efficiency and sustainability concepts such as building performance indicators, renewable energy integration, and carbon footprint reduction obscure or foreign. As a result, it may be difficult for consumers to evaluate the true significance of sustainable certifications and the tangible characteristics they provide in terms of energy savings and environmental responsibility.

Moreover, the lack of uniformity and clarity among various sustainable certification systems may also contribute to the low perceived value. Numerous certification programs with diverse criteria, labeling schemes, and levels of recognition can cause consumer confusion. The absence of a unified framework or a widely accepted standard in sustainable certifications can undermine their credibility and make it difficult for consumers to distinguish between certifications and identify their respective value propositions.

Another underlying cause for the low perceived value of sustainable certifications may be the presence of competing attributes and considerations during the home-buying decision-making process. When purchasing a home, consumers prioritize a variety of factors, including location, price, size, amenities, and architectural design. In the decision-making process, the perceived value of sustainable certifications may be overshadowed by these more immediate and readily recognizable factors, thereby diminishing their significance.

Furthermore, when selecting a housing operator to meet their housing requirements, consumers' brand perception and reputation can have a significant impact on their decisions. In the construction industry, a reputable brand often signifies dependability, quality, and adherence to high standards, which can inspire consumer confidence and trust. Based on their past experiences or market reputation, consumers may associate a particular housing operator with positive characteristics such as craftsmanship, attention to detail, and customer satisfaction. This perception of the brand may be strengthened by word-of-mouth recommendations, online reviews, and the company's track record of successful initiatives. In addition, consumers may perceive a well-established brand as an indication of financial stability and a long-term commitment to quality, mitigating

concerns regarding construction delays, substandard craftsmanship, or inadequate after-sales service. As a result, consumers may view the repute and brand perception of a housing operator as a signal of dependability and assurance that their housing requirements will be met, placing it above other decision-making factors.

Given that respondents indicated sustainability plays a role in their decision-making, perceived value, and as an investment for future sale situations, it was perplexing that many of them were oblivious of the certifications for their home and development. The distrust or lack of cognizance demonstrated by consumers in this study could be attributed to a level of moral hazard due to a lack of information. Further, the findings suggest a noteworthy correlation between individuals' level of sustainability knowledge and their familiarity with sustainable certifications. Those who demonstrate a greater awareness and concern for sustainability also tend to possess more extensive knowledge about sustainable certifications and their implications. Consequently, it is observed that the younger generation tends to have a higher level of certification knowledge compared to the elderly generation.

Furthermore, it becomes apparent that individuals who have recently purchased or are planning to purchase a newly constructed apartment display the highest degree of knowledge regarding sustainability certifications. This can be attributed to the fact that their apartment acquisition involved a sustainable certified residence, thereby necessitating a certain level of understanding and awareness. On the other hand, the elderly who purchased a home several years ago exhibit lower levels of knowledge and awareness regarding sustainable certifications. This can be attributed to their limited exposure through earlier education and familiarity with sustainability certifications. The lack of sustainable certification knowledge among the elderly generation also translates into their lack of confidence in the performance of housing operators. With limited understanding of sustainability and sustainability certifications, they are less equipped to evaluate the behavior and practices of housing operators in relation to sustainability standards.

5.3 Willingness to pay

In the context of this study, respondents expressed an expectation that sustainable certified homes would command a price premium ranging from 5 to 15%. Even among those who expressed unwillingness to pay extra for sustainable certification, their expected premium still fell within this range, indicating a general recognition of the potential price premium of sustainable certified homes.

Some respondents in the study expressed the belief that purchasing a sustainable certified home is an investment that could potentially increase the property's value. They perceive sustainability certification as a factor that could positively impact the resale value of the property in the future. Furthermore, examining the payback period associated with sustainable certifications could make sustainable certifications more pertinent and understandable, especially if the payback period is relatively brief. If the repayment period is advantageous, it could convince skeptic consumers that sustainable certifications could be financially viable options.

The findings of this study suggest that payback periods may not be intrinsically appealing to the majority of consumers when evaluating the efficacy of sustainable certification from the standpoint of purchasing a property. Despite the potential cost savings associated with energy efficiency, respondents' willingness to pay a premium for sustainable certifications was limited. This suggests that the financial benefits of energy savings over time, as indicated by repayment periods, may not be the primary factor influencing consumer decisions regarding sustainable certifications.

This dearth of attractiveness may be caused by a number of factors. Initially, consumers may place greater emphasis on immediate financial considerations, such as the purchase price and affordability of a property, than on long-term cost reductions. Given the substantial financial commitment involved in purchasing a property, consumers may be inclined to prioritize immediate expenses over prospective savings in the future. In addition, the complexity involved in calculating and estimating repayment periods may also contribute to their limited appeal. Considering factors such as fluctuating energy prices, household utilization

patterns, and future energy efficiency improvements, it may be challenging for consumers to accurately estimate and project energy savings over time. The absence of clarification and transparency regarding the calculation and presentation of repayment periods in the context of sustainable certifications may further diminish their perceived relevance and efficacy among consumers.

Moreover, a variety of factors, such as personal values, lifestyle preferences, and environmental awareness, might influence the decision-making processes of consumers. Therefore, the attractiveness of sustainable certifications may be impacted by consumers' propensity to support sustainable practices, as opposed to the potential financial returns in the form of repayment periods alone.

Consumer attitudes toward sustainable certifications were found to be significantly influenced by age. In the study, younger respondents demonstrated greater knowledge and placed a higher value on certifications, indicating a relationship between age and interest in sustainability. On the other hand, elderly respondents demonstrated a lack of interest in sustainability certifications, consistent with previous research indicating that individuals with a reduced propensity for green behavior may demonstrate a lack of interest in sustainability certifications (Murphy, 2014). Consequently, younger respondents who self-identified as green consumers have a higher propensity to pay a premium for sustainable certified dwellings.

Further, it is notable that there were no significant differences in respondents' willingness to pay for sustainable certifications based on their educational level or job position. Despite a possible expectation that individuals with higher levels of education or higher-ranking jobs would be more inclined to value sustainability and be willing to pay a premium for sustainable certified residences, this study found no such differences. It suggests that factors other than educational background and job position, may play a greater role in influencing consumer attitudes and behaviors regarding sustainability.

5.4 Implications

In comparison to previous research, the qualitative nature of our study allows for a nuanced comprehension of consumer perspectives on sustainable certification in the context of home purchase decisions. By conducting in-depth interviews with a limited sample size, we were able to evaluate the efficiency of sustainable certifications from the consumers' perspective. Importantly, the current study's findings should be viewed as exploratory and hypothesis-generating. Additionally, it can be utilized by certification system stakeholders to improve their communication strategies, streamline information, and highlight the tangible attributes of sustainable certifications.

Furthermore, the lack of standardization and clarity among sustainable certification systems uncovered by our study might highlight the need for industry-wide efforts to improve consistency and comparability. The findings can inform the development of standardized criteria or benchmarks for sustainable certifications by policymakers and certification bodies. Establishing clear and transparent guidelines can facilitate improved consumer decision-making and increase trust in the value and dependability of housing operators and sustainable certified residences.

In conclusion, the current research on the efficacy of sustainable certification on the housing market has revealed an intriguing paradox: the thin line between green illusion and green confusion. Prospective and current householders in Oslo are tasked with traversing the complex landscape of sustainable certifications, much like diners at a buffet who must distinguish healthy options from enticing indulgences. The paper has investigated the complexities surrounding consumers' knowledge, perceptions, willingness to pay and perceived performance of sustainable certification attributes in the domain of sustainable housing purchase decisions.

The findings revealed that consumer awareness and knowledge of sustainable certifications for housing are relatively low, with respondents struggling to recall specific certifications and associated attributes. This may explain why the majority

of consumers were unwilling to pay a substantial premium for sustainable certified homes. However, the majority indicated that sustainability does influence their purchasing decisions, indicating that they recognize its significance. There were notable differences between prospective and current homeowners when evaluating the performance of housing operators based on sustainable certification attributes. Current homeowners had limited expectations and knowledge of certifications, whereas younger prospective homeowners had greater expectations and emphasized the importance of housing operators' sustainable performance. These findings support earlier research indicating that interest in sustainability is influenced by socio-demographic factors, with younger individuals exhibiting greater interest as a result of greater exposure to sustainability issues. Inadequate consumer comprehension, technical complexity, and a lack of standardization and clarity in certification systems might be identified as obstacles. Targeted efforts to improve consumer awareness and knowledge, enhance standardization, and emphasize the tangible attributes of sustainable certifications can help bridge the gap between perception and reality, empowering individuals to make informed decisions.

5.5 Limitations and Suggestions for Future Research

The qualitative character of our research enabled a nuanced understanding of consumer perspectives on sustainable certification in the context of home purchase decisions. However, our findings cannot be generalized to a broader context due to the small sample size and the narrow focus on private purchasing decisions in Oslo. The exploratory nature of the findings proposes future research avenues for examining the identified challenges in greater depth. To quantify the impact of certification on consumer attitudes, purchasing decisions, and propensity to pay for sustainable attributes, future research can employ larger sample sizes, mixed methods approach, and quantitative analyses.

Additionally, the findings raise concerns about the role of intermediaries, such as real estate agents and housing operators, in promoting and disseminating information about sustainable certifications. Further investigation into their perspectives, current knowledge, and communication challenges can inform training programs and support initiatives aimed at enhancing their capacity to

effectively communicate the value of sustainable certifications to consumers. This can result in enhanced interactions between intermediaries and consumers, fostering a deeper appreciation for sustainable housing options.

Furthermore, this study focused exclusively on the perspective of consumers and did not consider the perspectives of vendors, tenants, or commercial purchasers. Examining the perspectives of various stakeholders can provide a more holistic comprehension of the issues surrounding sustainability certification in the housing market.

As a qualitative study, the findings are susceptible to social desirability bias, and additional research is needed to validate and expand upon the conceptual framework presented in this study. Quantitative studies can supplement qualitative insights by providing more robust and representative information regarding consumer perceptions of sustainability certification. Thus, the qualitative insights can be validated, the prevalence of sustainable certification attitudes quantified, and demographic or contextual factors influencing consumer perceptions identified by conducting large-scale surveys with a more diverse sample of homeowners.

In addition, this study's evaluation of the efficacy of sustainability certification relied on participant interviews to determine their stated preferences. Future research could investigate the revealed preferences of consumers by analyzing their actual sustainable housing purchase behavior. This would entail determining if the low preference for sustainability certification is due to a lack of evident tradeoffs in comparison to conventional attributes. Understanding the revealed preferences of consumers through behavior can provide greater insight into their decision-making processes and provide a more convincing explanation for the observed lack of awareness and knowledge.

Furthermore, analyzing prospective price premiums and market advantages associated with sustainable certifications can provide empirical evidence of the certifications' effect on resale value. Future research could investigate the actual resale value of sustainable certified homes versus non-certified homes, considering market trends, location, and property characteristics. Moreover, it is essential to

acknowledge that, despite being a component of the potential financial benefits of sustainable certifications, repayment periods may not be an influential factor for the majority of consumers. Future research should continue to investigate the multifaceted nature of consumer preferences and motivations in order to improve the relevance and effectiveness of sustainable certifications in the housing market, considering other immediate financial factors and the broader value proposition of sustainability certifications.

Additionally, the paper has examined the effect of the sustainable certifications on market transactions and has not determined the extent to which the sustainable certification has directly influenced investments in energy efficiency. Due to the inherent distinctions between sustainably certified and non-certified residences, estimating the financial impact of certification is challenging. These differences include aspects such as energy efficiency, building materials, and design characteristics.

The current study reveals that the housing market is characterized by a complex interplay between the green illusion and green confusion, highlighting the need to empower individuals to make informed housing decisions. Therefore, the future objective should be to reduce green confusion by bridging the divide between perception and reality and ensuring that the green illusion of sustainable certifications in the housing market closely resembles the actual sustainable practices and characteristics they represent.

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7.0 APPENDIX

7.1 Interview Guide

Introduction to the interview

Thank you for participating in this in-depth interview. The purpose of this interview is to gather insights into your choices and preferences regarding residence purchases. The interview is expected to take approximately 20 to 30 minutes of your time. We are genuinely grateful for your time and contribution.

Please be assured that all information shared during this interview will be treated with confidentiality. Your identity and responses will remain anonymous and will only be used for the purpose of our master's thesis. Your participation in this interview is voluntary, and you may choose to withdraw at any point.

Before we begin, please let us know if you have any questions or concerns about the interview process or the topic we will be discussing. Once again, thank you for your participation, and let’s proceed with the interview.

Part 1: Attitude Toward Sustainability		
	Question	**Probes**
Question 1	Please give a list of the 5 most important elements you consider when making a residence purchase from most to least important.	• Price • Size • Location • Amenities • Housing operator • Aesthetics • Sustainability • Newness • Solar conditions • Type of residence • Condition of housing • Maintenance
Question 2	What does sustainability mean to you in the context of housing?	• Energy efficiency (e.g., well insulated) • Sustainable materials • Durability • Green technologies (e.g., solar panels and heat pumps) • Sustainability certification • Location: proximity to work/school to reduce reliance on cars
Question 3	Does sustainability influence your housing choice?	• If yes, how? • If not, why?
Part 2 - Sustainability Certification		
Question 4	What housing sustainability certifications are you aware of?	• Svanemerket • Energy labeling (A-G) • ISO 14001 • Miljøfyrtårn • BREEAM • WELL Building Standard • DGNB • LEED

Question 5	Do you associate any specific attributes/characteristics with a residence that has been certified as sustainable?	• Higher or lower price compared to non-sustainable certified residences • Larger or smaller size compared to non-sustainable certified residences • Higher or lower quality compared to non-sustainable certified residences • More or less comfortable than non-sustainable certified residences • More or less aesthetically attractive than non-sustainable certified residences • More or less practical/utilitarian than non-sustainable certified residences • Use of more sustainable materials than non-sustainable certified residences • More or less energy efficient than non-sustainable certified residences • Easier and more efficient maintenance than non-sustainable certified residences
Question 6	How do you perceive the performance of housing operators based on these attributes?	• Do you trust that the sustainable certification attributes will perform as expected/promised by the operators?
Question 7	If the price of a non-certified residence has an index value of 100, how much would you expect to pay for a similar certified home?	• For instance, if a certified residence is 20% more costly, the answer is 120; if it is less expensive, the answer is less than 100
Question 8	Considering your earlier response, would the price difference between a certified residence and a similar non-certified residence be acceptable to you for your purchase?	

Question 9	What is the highest percentage you would be willing to pay for a sustainability certified home?	
Part 3 - Housing Preferences and Demographics		
Question 10	In which area of Norway do you prefer to buy a residence?	
Question 11	Have you bought or do you plan to buy a residence?	
Question 12	What type of residence have you purchased or do you plan to purchase?	• For example, apartment, condo, single-family home, etc.
Question 13	How old are you? (in years)	
Question 14	What is the highest educational level you have attained?	
Question 15	What is the job title/position?	