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Faculty of Business Economics

Master of Management

Master's thesis

What factors motivate consumers to choose sustainable options when building or renovating their home?

Veronika Vránska

Thesis presented in fulfillment of the requirements for the degree of Master of Management, specialization International Marketing Strategy

SUPERVISOR :

Prof. dr. Robert MALINA

MENTOR :

Mevrouw Nazanin LOVE

2023

2024

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Abstract

The environmental crisis, characterized by climate change, biodiversity loss, or urban pollution, emphasize the need for a transformation in environmental behaviors, especially within the building industry. This thesis explores the motivations behind consumer decisions to adopt sustainable practices during home renovation and building projects. Using the Protection Motivation Theory (PMT) as the theoretical framework, this study examines how various motivational factors, including economic, social, environmental, regulatory, personal-psychological, and cognitive-practical motivations, influence sustainable behavior in the construction sector.

Employing a quantitative research methodology, this research utilizes an online survey targeting individuals involved in home renovation or construction in Slovakia over the past ten years. The survey assesses the relative impact of different motivators through a Likert scale, with data analyzed using factor analysis, correlation, and multiple regression in SPSS. Findings reveal that environmental and social factors are the most significant drivers of sustainable behaviors, overshadowing economic incentives.

This thesis contributes to the broader understanding of behavioral change in the building industry, offering insights that can guide the development of effective policies and interventions to promote sustainability. The results emphasize the need for a comprehensive approach in encouraging sustainable building practices, considering not just economic and practical aspects but also social and emotional dimensions. These insights can lead stakeholders in refining strategies to better align with consumer motivations and encourage sustainability in the building sector.

Key words: Environmental Crisis, Environmental Behavior, Consumer Behavior, Building Industry, Sustainable Building Practices, Protection Motivation Theory (PMT), Motivational Factors

Abstract

De milieucrisis, gekenmerkt door klimaatverandering, verlies van biodiversiteit en stedelijke vervuiling, benadrukt de noodzaak voor een transformatie in milieugedrag, vooral binnen de bouwindustrie. Deze scriptie onderzoekt de motivaties achter consumentenbeslissingen om duurzame praktijken aan te nemen tijdens woningrenovatie- en bouwprojecten. Met behulp van de Protection Motivation Theory (PMT) als theoretisch kader, onderzoekt deze studie hoe verschillende motivationele factoren, waaronder economische, sociale, milieu-, regelgevende, persoonlijk-psychologische en cognitief-praktische motivaties, duurzaam gedrag in de bouwsector beïnvloeden.

Dit onderzoek gebruikt een kwantitatieve onderzoeksmethode en maakt gebruik van een online enquête gericht op personen die in de afgelopen tien jaar betrokken zijn geweest bij woningrenovatie of bouw in Slowakije. De enquête beoordeelt de relatieve impact van verschillende motivaties via een Likert-schaal, met data geanalyseerd met behulp van factoranalyse, correlatie en meervoudige regressie in SPSS. Uit de bevindingen blijkt dat milieu- en sociale factoren de meest significante drijfveren zijn voor duurzaam gedrag, en dat ze economische prikkels overschaduwen.

Deze scriptie draagt bij aan een breder begrip van gedragsverandering in de bouwindustrie en biedt inzichten die kunnen leiden tot de ontwikkeling van effectieve beleidsmaatregelen en interventies om duurzaamheid te bevorderen. De resultaten benadrukken de noodzaak van een omvattende aanpak bij het aanmoedigen van duurzame bouwpraktijken, waarbij niet alleen economische en praktische aspecten worden overwogen, maar ook sociale en emotionele dimensies. Deze inzichten kunnen belanghebbenden helpen om strategieën beter af te stemmen op consumentenmotivaties en duurzaamheid in de bouwsector te bevorderen.

Sleutelwoorden: Milieucrisis, Milieugedrag, Consumentengedrag, Bouwindustrie, Duurzame Bouwpraktijken, Protection Motivation Theory (PMT), Motivationele Factoren

Preface

The pursuit of a Master of Management in International Marketing Strategy has taken me on a journey to explore what motivates consumers toward sustainable building and renovation practices. This master thesis, entitled " What factors motivate consumers to choose sustainable options when building or renovating their home?" written under the supervision of Prof. dr. Robert Malina and with the essential mentorship of Nazanin Love, explores the motivational layer of consumer behavior during an escalating environmental crisis.

I was motivated to study this topic because of the growing awareness of serious environmental problems like climate change, biodiversity loss, urban pollution, and water scarcity. The building industry, which contributes significantly to these issues, was a key area to explore for potential changes in consumer behavior. This paper aims to provide insights that can help develop effective interventions and policies to promote sustainable options in the building industry.

The research process had its challenges. For example, it was difficult to find people in Slovakia who had renovated or built their home in the past ten years. Despite these obstacles, I successfully distributed an online questionnaire to a convenience sample, providing useful data on the factors that influence sustainable building and renovation decisions.

The theoretical foundation of this work was based on the Protection Motivation Theory, which suggests that perceived threats and the effectiveness of responses determine consumer behavior. It was found that environmental concerns, social influences, and personal beliefs are stronger motivators than economic or practical factors. Such a broad view of consumer motivations is useful to better design interventions and policies.

I would like to thank in particular my mentor, Nazanin Love, whose advice not only directed the research but also provided the valuable support and encouragement. I would also like to thank my family and friends who supported and believed in me during my academic journey.

The aim of this thesis is to approach and get a more comprehensive understanding of the multifaceted motivations driving sustainable consumer behavior within the building industry. Hopefully, the gained insights will contribute to a more sustainable future, offering inspiration for future research in this relevant field.

Veronika Vránska

Summary

The title of the master's dissertation: What factors motivate consumers to choose sustainable options when building or renovating their home?

Surname and first name of the student: Veronika Vránska

Program and specialization: Master of Management, International Marketing Strategy

Supervisor: Prof. dr. Robert Malina

Mentor: Nazanin Love

Introduction

In dealing with the severe environmental crisis our planet faces today, including climate change, biodiversity loss, urban pollution, and water scarcity, it is increasingly clear that significant changes in both individual and collective environmental behaviors are necessary. This thesis explores the various motivations behind consumers' decisions to adopt sustainable practices during home renovation and building projects. We focus particularly on the building industry because it significantly contributes to these environmental issues. Changing human behavior and societal norms is extremely difficult. Therefore, by identifying the specific motivations that drive sustainable practices, this study aims to provide valuable insights that can help design effective interventions and policies within the building industry to promote sustainable options and thereby contribute to broader environmental sustainability goals (DuNann Winter & Koger, 2004; Gardner & Stern, 2002; Vlek & Steg, 2007; Ripple et al., 2017; Lange, 2023; Louzi et al., 2022; Häkkinen, 1994).

Literature Review

In the literature review for this thesis, we explored a range of articles to understand different theories about environmental behaviors, choosing the Protection Motivation Theory (PMT) as our theoretical base. This theory was selected because it helps explain why people choose to adopt sustainable practices by focusing on how serious they believe environmental threats are, how likely they feel they are to be affected, and how effective they think their actions can be in addressing these threats. Including PMT elements in the research provides deeper insight into why people decide to build sustainably, as shown by Norman et al. (2015) and Kothe et al. (2019).

We also reviewed articles to identify what motivates consumers when they are renovating or building their homes. In the studies we examined, we found a wide range of motivators, such as economic benefits, social influences, personal values, and many others, all of which significantly impact environmental behaviors. We carefully categorized various types of motivations that, according to different studies, influence consumers when they are renovating or building their homes. The main categories we included, besides the PMT Constructs, are Economic, Regulatory, Environmental, Social, Personal/Psychological, and Cognitive-Practical motivations. Each category contains specific motives, such as cost savings, environmental benefits, social expectations, personal beliefs, or convenience.

Methodology

We examined these main motivation factors and tested our hypotheses through an online survey. The methodology involved distributing an online questionnaire to individuals who have engaged in home renovation or construction within the past ten years in Slovakia. Respondents expressed their agreement with statements related to economic, regulatory, environmental, social, psychological/personal, cognitive-practical motivators, and PMT constructs using a 5-point Likert scale. This approach allowed us to collect quantifiable data about the importance of each motivational factor in the decision-making process for home renovations and building projects.

Findings

The correlation analysis revealed significant relationships among the motivational factors. We observed a strong correlation between Environmental Motivation and Social Motivation, indicating that environmental concerns are closely linked with social factors. Social Motivation is significantly associated with both Protection Motivation Theory (PMT) Constructs and Personal/Psychological Motivation as well. This emphasizes the impact of social influences on protective and personal motivations.

The key findings of our thesis, based on the regression analysis, reveal that various factors influence consumer decisions for sustainable home building and renovation in Slovakia. The constructs of Protection Motivation Theory (PMT), including perceived severity of environmental threats, vulnerability, and belief in the effectiveness of protective behavior, are the most powerful drivers, with a regression coefficient of 0.674 and a p-value of <0.001. This insight confirms previous studies that tested PMT constructs (Shafiei A. & Maleksaeidi H., 2020; Janmaimool P., 2017), demonstrating that when people perceive higher environmental risks and believe their actions can make a difference, they are more likely to adopt behaviors that lead to sustainability.

Environmental concerns are also highly influential with a regression coefficient of 0.539 and a p-value of <0.001, as individuals significantly motivated by their awareness of environmental impacts tend to choose sustainable materials. This aligns with the findings of Leslie et al. (2021), Barreto et al. (2014), and Jowkar et al. (2022), among others.

Social influences, such as community values and societal norms, strongly shape decisions towards sustainability, highlighting the role of social context in encouraging eco-friendly building practices. This is supported by a regression coefficient of 0.536 and a p-value of <0.001. These findings are consistent with Park and Kwon (2017), despite contradictory findings from Gręboszz-Krawczyk (2021).

Personal beliefs and emotions significantly influence consumer choices, with anticipated emotions and self-efficacy showing a regression coefficient of 0.478 and a p-value of <0.001, as highlighted by Mastria et al. (2023).

Although economic factors such as cost savings and financial support are important, they do not motivate individuals as strongly as environmental or social factors do. Legal requirements and policies also encourage people to make sustainable choices, demonstrating that government regulations are effective in promoting green building practices, although not overwhelmingly so.

Practical considerations, such as the ease of implementing sustainable options and their direct benefits, are the least influential factors. Economic, regulatory, and cognitive-practical factors, while less influential, remain significant with regression coefficients below 0.400 and p-values of <0.001 and 0.002, respectively, findings that are consistent with those of Meles and Ryan (2022).

In conclusion, our study supports all our hypotheses, demonstrating that PMT Constructs, Economic, Regulatory, Environmental, Social, Personal/Psychological, and Cognitive-Practical Motivations significantly motivate sustainable choices in home building and renovation.

Conclusion

Combining all these elements, the thesis provides a comprehensive view of the various factors that drive sustainable building and renovation choices. The findings suggest that motivating consumers towards more sustainable choices should not only focus on the practical and economic aspects but also consider the emotional and societal dimensions that significantly impact consumer behavior in the context of sustainability. This comprehensive understanding can help in designing more effective interventions and policies promoting more sustainable building practices across different demographics.

Managerial Implications

Our paper provides actionable and practical recommendations that managers can implement to improve decision-making and encourage sustainable choices in building and renovating homes, based on the study's results. One recommendation is that managers should highlight the environmental benefits of their products, as people often choose sustainable options due to their environmental awareness and concerns. However, accuracy is crucial to avoid the negative impacts of greenwashing. Regulatory compliance and sustainable reporting are also important factors in customer choices. Social proof and community engagement, such as partnerships with trusted community members and influencers, might be effective in influencing consumer behavior towards sustainability as well. Economically, emphasizing long-term cost savings and property value increases can motivate consumer choices. Personal factors like aligning marketing messages with individual values and offering practical education about sustainable practices can further encourage sustainable choices (Guerreiro & Pacheco, 2021; McComb, 2002; Glass, 2012; Valente & Pumpuang, 2007; Harangozó & Zilahy, 2015; Boogen et al., 2022; Taufique, 2022; Moslehpour et al., 2018; Epstein & Roy, 2001; Hayles & Kooloos, 2005).

Limitations and Recommendations for Future Research

Limitations of the study include its reliance on convenience sampling and self-reported data, which may affect the generalizability and accuracy of the findings. Future research should consider other sampling methods, extended data collection periods, and qualitative analyses to support the understanding of consumer motivations in sustainable building and renovation.

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Introduction

The world is currently facing a severe environmental crisis. We can observe this crisis in phenomena such as climate change, loss of biodiversity, urban pollution, water scarcity, and excessive noise pollution (DuNann Winter & Koger, 2004; Gardner & Stern, 2002; Vlek & Steg, 2007). A significant contributor to these issues is the environmental behavior of individuals. This behavior leads to excessive energy use, waste production, and other harmful activities (Kollmuss & Agyeman, 2002). To overcome these challenges, a visible change in human behaviors is needed. (Ripple et al., 2017; Lange, 2023).

However, changing behavior on a large scale is very difficult. Despite widespread awareness of environmental issues, altering human habits and societal norms is complex (Lange, 2023). The difficulty lies not only in encouraging individuals to adopt new practices but also in overcoming systemic barriers that facilitate harmful behaviors (Barr & Gilg, 2007).

The building industry significantly contributes to environmental problems, primarily through high material use and creating a lot of waste. The sustainable development becomes more important globally, but this industry faces challenges such as running out of natural resources and following strict environmental laws (Louzi et al., 2022; Häkkinen, 1994). Related industries try to address these issues with using lower-quality raw materials or increasing recycling efforts. However, researchers evaluate environmental impacts through employing life-cycle assessment (LCA) tools, and they strongly emphasize the importance of replacing traditional raw materials with recyclable waste or by-products to reduce environmental burdens (Häkkinen, 1994).

However, many in the industry are hesitant to fully adopt these sustainable practices. It is often due to uncertainties about the quality and production methods of recycled materials (Louzi et al., 2022). This reluctance is made worse by increasing landfill costs and the lack of available land. These highlight the serious environmental issues linked with modern construction activities. Furthermore, studies about operational impacts, such as the energy used for heating, compared to the environmental footprint of material use, underscore the critical role of material selection and effective waste management (Häkkinen, 1994). Exploring the use of green materials in construction projects is considered a key approach to promote sustainability. All these practices help reduce the environmental impact of the construction industry, supporting more sustainable building practices and contributing to global environmental sustainability goals (Louzi et al., 2022).

Researchers have developed various theoretical frameworks for understanding and influencing environmental behavior. In our research, we focus on identifying the motivations behind consumers' decisions to adopt sustainable practices during home renovation and building projects. We use the Protection Motivation Theory (PMT) as a theoretical core. This theory examines how individuals are motivated to engage in protective behaviors in response to perceived threats (Rogers, 1975; Kothe et al., 2019). Alongside PMT, we explore various factors/motivators that influence environmental behavior, including economic incentives, social norms, and personal values among others. Our goal is to examine motivations that drive consumers toward sustainability in the context of home improvement, which can help to develop effective policies and interventions to promote sustainable options in building industry.

To explore the motivations behind adopting sustainable practices in home renovations and building, this study will employ a quantitative research methodology in form of an online survey designed in the Qualtrics software. The survey will target individuals who have engaged in home renovation or construction within the past ten years in Slovakia. Participants will be selected using a convenience sampling method to facilitate efficient data collection within the specified demographic. The survey will be designed to measure various motivational factors, including economic, regulatory, environmental, social, personal/psychological, and cognitive-practical motivations, alongside the constructs of the Protection Motivation Theory (PMT). Respondents will be asked to rate their agreement with a series of statements on a 5-point Likert scale, providing quantitative data that will be analyzed in SPSS using factor analysis, descriptive statistics, correlation analysis, and multiple regression analysis to test the hypotheses about the impact of these motivations on sustainable behavior. With this approach we will examine how different motivational factors influence the decision to adopt sustainable building and renovation practices.

2 Environmental Behavior

Environmental behavior describes the actions individuals undertake to reduce their impact on the environment. These actions vary from reducing energy and resource use, preference of eco-friendly products, to minimizing waste generation (Kollmuss & Agyeman, 2002). The significance of such behaviors is critical, especially because the world faces environmental challenges including climate change, biodiversity loss, urban pollution, water scarcity, and noise pollution (DuNann Winter & Koger, 2004; Gardner & Stern, 2002; Vlek & Steg, 2007).

The raising issues of climate change and biodiversity reduction are largely attributed to human activities. This reality demands a change in behavior across societal levels (Ripple et al., 2017). Lange (2023) also emphasizes that effectively addressing these urgent problems requires broad behavioral changes among various actors. However, changing human behavior is a very complicated process. Achieving transformative change stands on a deep understanding of the reasons behind consumer's consumption patterns, and other relevant behaviors.

One approach to the complex process of changing human behavior is the Transtheoretical Model (TTM) of Change. The Transtheoretical Model (TTM) of Change, as detailed in the article by Petrocelli (2002), is an empirically derived, multistage model that describes the process of intentional behavior change. In TTM theory, there are concepts of stages and processes of change, where stages include Precontemplation, Contemplation, Preparation, Action, and Maintenance. This model integrates various counseling approaches, emphasizing that change occurs through a developmental process rather than solely through personality or behavioral modifications. TTM also highlights the importance of recognizing natural dynamics in individuals self-change efforts. It also outlines specific interventions suitable for each stage of change (Petrocelli, 2002). These stages are illustrated in a spiral in Figure 1 below.

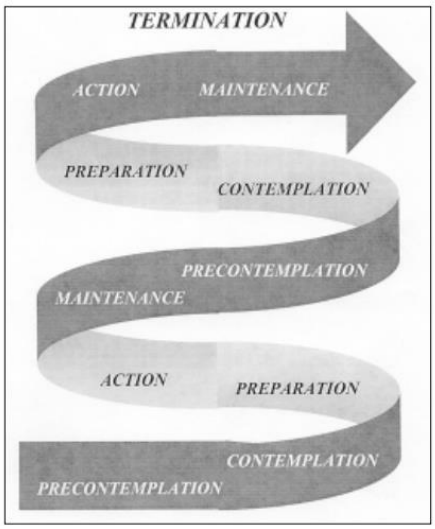

Figure 1 A Spiral Model of the Stages of Change (Petrocelli, 2002)

Fighting against the environmental crisis involves a thorough analysis of the factors driving environmentally harmful behaviors, designing strategies for behavioral modification, and supporting actions that help with environmental conservation. Developed countries' governments are already

focusing on promoting individual environmental practices such as energy saving, water conservation, waste management, and sustainable consumption to achieve their environmental objectives (Barr & Gilg, 2007). Nonetheless, the path to the environmental improvement is very complicated, it demands insight into which behaviors need alteration, how to monitor these changes, and the motivations behind them. These motivations can be for example economic, ethical, or habitual. Furthermore, the implementation of physical and technological innovations, essential for reducing environmental impacts, depends on individuals' readiness to adopt, understand, and consistently use these innovations (Steg & Vlek, 2009).

Ecological Modernization Theory, as outlined in the article by Buttel (2020) emphasizes that environmental improvements can and should be achieved through advancements and reforms within the capitalist and industrial frameworks. The theory suggests that economic development, environmental protection, and innovation can coexist. It highlights that modernization processes, including state policies, technological advancements, and economic mechanisms, can be leveraged to address environmental challenges, but still allowing economic growth. This perspective calls for the transformation of the state and market to enable environmentally friendly practices and behaviors (Buttel, 2020).

3 Theoretical Frameworks

There are many theoretical frameworks exploring environmental behavior and each of them is offering distinct insights into the motivations behind individuals' actions towards the environment. Among these are the Theory of Planned Behavior (TPB), the Value-Belief-Norm (VBN) theory, the Transtheoretical Model (TTM) of Change, Social Practice Theory, Ecological Modernization Theory, the Norm Activation Model (NAM), and Protection Motivation Theory (PMT), among others. To understand different environmental behaviors, we will explore some of these theories in the sections that follow.

3.1 Review of Theories Related to Environmental Behavior

One of the first theories and models were Early US Linear Progression Models. These models suggest a linear sequence from environmental knowledge to awareness and concern, leading to pro-environmental behavior. They assume that increasing environmental knowledge will naturally result in more environmentally friendly actions (Kollmuss and Agyeman, 2002).

However, the theoretical framework presented by Barr and Gilg (2007) explores the complex relationship between individual attitudes towards environmental behavior and the actual actions undertaken. It challenges the linear model of behavior change, which assumes that increased awareness and knowledge lead directly to action. Instead, it proposes a more complicated understanding that includes a variety of factors influencing environmental action. This framework integrates concepts from the Theory of Reasoned Action, adding situational and psychological variables to explain the gap between stated intentions and actual behaviors. It highlights how values, personal situations, and attitudes influence environmental actions, which are present around people's everyday lifestyles rather than isolated behaviors. The role of context seems much broader, more generally relating to the impact of social norms and personal efficacy that could collectively influence the availability of opportunities to engage in environmental actions. In Figure 2, we can see the conceptual model of the framework developed by Barr and Gilg (2007).

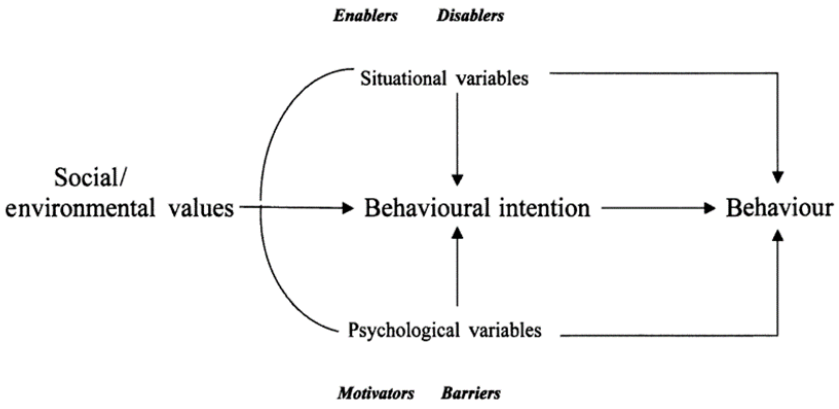

Figure 2 Barr and Gilg' (2007) Framework of Environmental Behavior

The Theory of Planned Behavior (TPB), developed from Fishbein and Ajzen's Theory of Reasoned Action, focuses on predicting reasoned behaviors. It outlines that an individual's behavior is influenced by their intention, which is affected by their attitude towards the behavior, subjective norms (the perceived social pressure to perform or not perform the behavior), and perceived

behavioral control (the perceived ease or difficulty of performing the behavior). TPB adds the component of perceived behavioral control to address situations where people feel they do not have full control over their behavior. This inclusion helps to better predict the likelihood that the behavior really occurs by considering the individual's beliefs about their ability to perform it under various conditions (Chao, Y. L., 2012). The theory, therefore, suggests that behavior is directly determined by the intention to perform the behavior, influenced by attitudes toward the behavior, subjective norms, and perceived behavioral control (Klöckner, C. A., 2013). This concept is visually represented in Figure 3 The TPB Model (Ajzen, 1991) below.

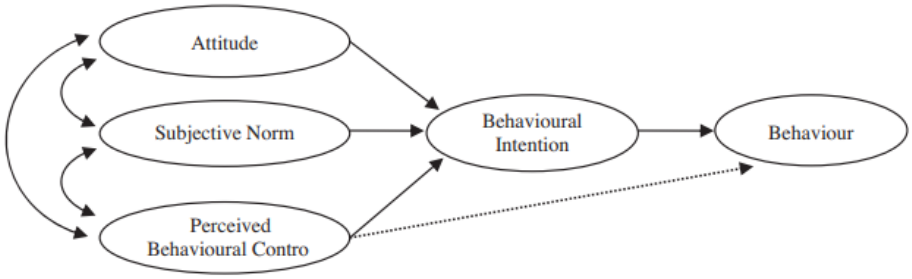

Figure 3 The TPB Model (Ajzen, 1991)

Kaiser, Hübner & Bogner's (2005) article compares the Theory of Planned Behavior (TPB) and the Value-Belief-Norm (VBN) Model in explaining conservation behavior. Based on the article, conservation behavior refers to actions that individuals take to preserve, protect, or restore the environment. These behaviors can include a wide range of activities such as recycling, using less water, reducing energy consumption, and purchasing eco-friendly products.

The TPB outlines that conservation behavior is primarily driven by three factors: attitudes towards the behavior, subjective norms (perceived social pressure to perform or not perform the behavior), and perceived behavioral control (the perceived ease or difficulty of performing the behavior) (Chao, Y. L., 2012; Klöckner, C. A., 2013; Kaiser, Hübner, & Bogner, 2005). Kaiser, Hübner & Bogner's (2005) article highlights that, according to TPB, these factors influence an individual's intention to act, which predicts actual conservation behavior. The TPB is a very strong and effective predictor of conservation behavior, and intention is one of the main reasons that explain variance in conservation behaviors.

The Value-Belief-Norm Theory (VBN), on the other hand, focuses on the role of deep-rooted values, beliefs, and norms in shaping conservation behavior. It suggests behavior is directly determined by personal norms. These are activated by combination of responsibility and awareness of consequences and influenced by a general ecological worldview and value orientations (Klöckner, 2013). It suggests that personal ecological values influence beliefs about the consequences of one's actions (or inactions) for the environment, which activate personal norms related to environmental responsibility. These personal norms then motivate conservation behavior. The VBN model emphasizes the moral and ethical dimensions of environmental behavior, claiming that individuals engage in conservation actions because they feel a moral obligation to do so, rather than only calculating the benefits and costs of their actions as suggested by the TPB (Kaiser, Hübner &

Bogner's, 2005). Figure 4 The VBN Model (Kaiser, Hübner & Bogner, 2005) below provides an illustration of this model.

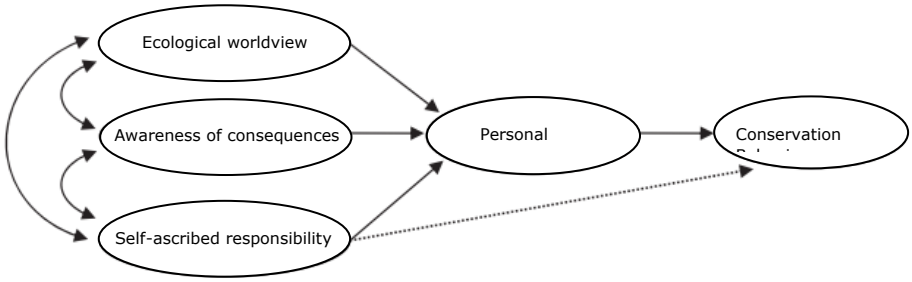

Figure 4 The VBN Model (Kaiser, Hübner & Bogner, 2005)

In comparing these two models, while both provide valuable insights into the factors driving conservation behavior, TPB represents a stronger predictive power and a more accurate depiction of the relationships among its constructs than the VBN model. However, it is important to note that the VBN model's focus on values, beliefs, and personal norms offers a complementary perspective that highlight the importance of ethical considerations and the intrinsic motivation behind conservation actions (Kaiser, Hübner & Bogner's, 2005).

Social Practice Theory, as discussed in the article by Hargreaves (2011), stands on the routine and collective organization of practices. It is because the primary units of analysis are about understanding pro-environmental behavior change, rather than focusing on individualistic and rationalist perspectives. It emphasizes the role of broad cultural entities in shaping individuals' actions, perceptions, and interpretations within the world. Consequently, this approach suggests a shift from traditional views that focus on individual attitudes or values towards understanding the social and collective organization of practices. They claim that these are essential in effecting behavior change.

Similarly, Altruism, Empathy, and Prosocial Behavior Models focus on the role of altruistic and empathetic motivations behind pro-environmental actions. They suggest that individuals who express a greater concern for others and the environment are more likely to engage in behaviors that benefit the environment, according to Kollmuss and Agyeman (2002).

Moreover, the Norm Activation Model (NAM), as explained in the article by Onwezen, Antonides, and Bartels (2013), suggests that for an individual to engage in pro-environmental behavior, their personal norms must be activated. This activation process is influenced by factors such as the awareness of consequences and the ascription of responsibility. Furthermore, the article investigates the role of anticipated emotions, particularly pride and guilt, within this model. They suggest that these emotions can mediate the effects of personal norms on behavior, which confirms the self-regulatory function of these anticipated emotions within the NAM.

Following this, according to Klöckner (2013), The Norm-Activation Theory (NAT) claims that people help others if they feel morally obliged to do so in a given situation, which is determined by awareness of need, awareness of consequences, ascription of responsibility, and perceived capability to help.

Building on these perspectives, all the theories and models mentioned above (The Value-Belief Norm Theory, Social Practice Theory, Altruism, Empathy, and Prosocial Behavior Models, the Norm Activation Model (NAM)) move beyond models that focus solely on individual decision-making based on rational calculations of costs and benefits. Instead, they acknowledge the role of deeper, more complex factors in shaping behavior. They collectively emphasize that effective strategies for promoting environmental conservation must consider psychological, social, and emotional components (Hargreaves, 2011; Kollmuss & Agyeman, 2002; Onwezen, Antonides, & Bartels, 2013; Klöckner, 2013). Additionally, Sociological Models incorporate sociological and psychological factors to explain pro-environmental behaviors. They consider a broader range of influences, including personal values, social norms, and external conditions that enable or hinder ecological actions, as highlighted by Kollmuss and Agyeman (2002).

3.2 Protection Motivation Theory

The author of Protection Motivation Theory (PMT) is Rogers, who developed it in 1975 to describe how are individuals motivated to react in a self-protective way towards a perceived health threat (Rogers, 1975). Kothe et al., (2019) in their article linked PMT with the pro-environmental behavior and described this theory which contains two main processes that determine the engagement in protective behaviors: coping appraisal and threat appraisal. These processes assess the perceived severity and susceptibility to threats, the intrinsic and extrinsic rewards for not performing protective behaviors, and the perceived efficacy of the protective behavior, including response efficacy and self-efficacy, as well as perceived costs. The theory suggests that individuals are motivated to engage in protective behaviors (adaptive responses) when they perceive a high threat (high threat appraisal) and believe that their protective actions can minimize this threat (high coping appraisal). Components like threat severity, susceptibility, and maladaptive rewards influence the intention to act protectively, while response efficacy, self-efficacy, and response costs are considered when deciding whether to adopt a protective behavior (Kothe et al., 2019). This model is illustrated in Figure 5 Protection Motivation Theory (Kothe et al., 2019) below.

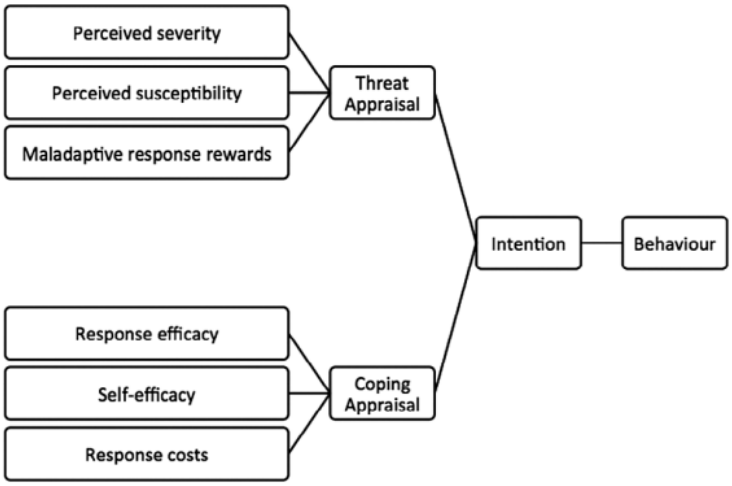

Figure 5 Protection Motivation Theory (Kothe et al., 2019)

Threat Appraisal represents one aspect of the Protection Motivation Theory (PMT) and involves evaluating several key components. The first is Perceived Severity, which assesses how serious the

consequence of the threat are believed to be. Following this, Perceived Susceptibility considers the likelihood of being affected by the threat. Third, Maladaptive Response Rewards are representing the benefits or rewards of not engaging in the protective behavior. These can be social, financial, or psychological. (Kothe et al., 2019) Threat appraisal considers the source of the threat and evaluates the probability of engaging in maladaptive responses, like avoidance or denial. It also includes the assessment of the perceived severity and vulnerability to the threat, which can prevent maladaptive responses. At the same time, individuals may recognize certain rewards, both intrinsic, like pleasure, and extrinsic, like social approval, which can increase the likelihood of maladaptive responses (Norman et al., 2015).

On the other side of the PMT is Coping Appraisal, which contains assessing the belief in the effectiveness of the protective behavior to minimize the threat, known as Response Efficacy, and Self-Efficacy, which is the confidence in one's ability to perform the protective behavior. Response Costs are also evaluated. They represent the perceived costs associated with performing the protective behavior, which can include time, money, effort, and other sacrifices (Kothe et al., 2019).

Intention plays a crucial role in this model. Intention here means the determination to perform a behavior, influenced by both threat appraisal and coping appraisal. If the individual appraises the threat as serious and feels open to respond, and also believes that the response is effective (response efficacy) and is capable of performing it (self-efficacy), and the costs are not outrageous, the individual is likely to have an intention to perform the protective behavior (Kothe et al., 2019).

Finally, Behavior represents the actual action of the protective behavior. We understand this as a formation of the intention to act (Kothe et al., 2019). The PMT is recognized as a powerful predictor of intention than of future behavior, which means that while people may be motivated to perform a behavior, actual future behavior may not always align with those intentions. This can be caused by various factors, for example the complexity of behavior changes and the presence of barriers that may not have been anticipated or adequately addressed by the coping strategies (Norman et al., 2015).

The model developed by Norman, Boer, Seydel, and Mullan (2015) substitutes "intention" with "protection motivation". This model is depicted in Figure 6 Protection Motivation Theory (Norman et al., 2015) below.

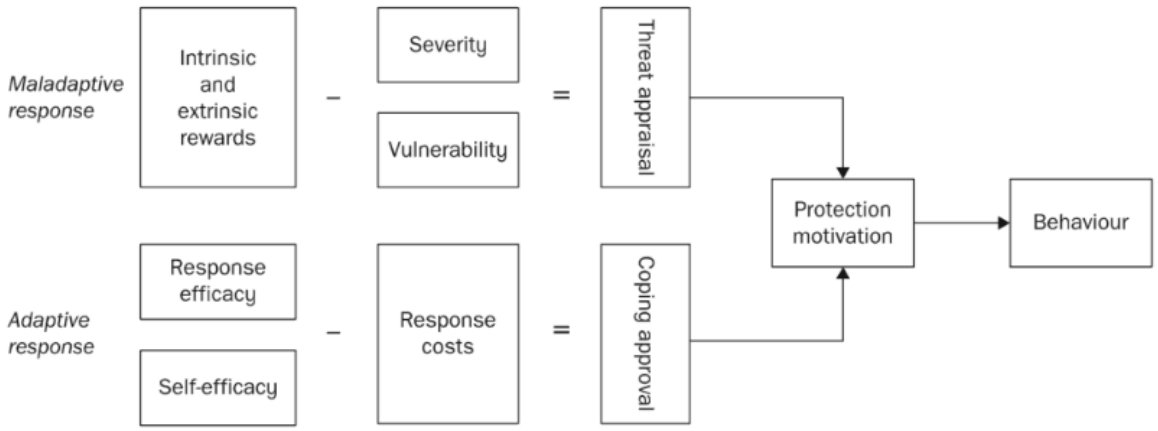

Figure 6 Protection Motivation Theory (Norman et al., 2015)

This model also suggests that individuals are more likely to adopt protective behaviors if they believe the threat is severe and they are open to respond, the recommended protective behavior is effective, and they can perform it, and if the perceived costs of these behaviors are not too high. Strong personal norms are increasing the likelihood of engaging in the adaptive behavior as well (Norman et al., 2015).

The meta-analysis reported in the article by Floyd, Prentice-Dunn, and Rogers (2000) on Protection Motivation Theory (PMT) summarized findings from 65 studies reaching approximately 30,000 participants. The results showed a mean overall effect size of moderate magnitude, indicating that increases in threat severity, threat vulnerability, response efficacy, and self-efficacy facilitated adaptive intentions or behaviors. Conversely, decreases in maladaptive response rewards and adaptive response costs increased adaptive intentions or behaviors. This pattern held true regardless of whether the measures were based on intentions or behaviors. The findings suggest that PMT components may be useful for individual and community interventions (Floyd, Prentice-Dunn, & Rogers, 2000).

Meta-analyses of other PMT studies have shown that coping appraisal variables generally provide stronger predictions of protection motivation and behavior than threat appraisal variables. Particularly Self-efficacy has been identified as having a large effect size and being a strong predictor of concurrent and future behavior (Norman et al., 2015).

Bockarjova & Steg (2014) used the conceptual model based on the Protection Motivation Theory (PMT), but they adapted it to explain the adoption of electric vehicles (EVs) in the context of slow-onset environmental risks, such as climate change and sustainability challenges. This model integrates both threat appraisal and coping appraisal processes to predict pro-environmental behavior. This conceptual model is illustrated in Figure 7 Conceptual Model of The PMT (Bockarjova & Steg 2014).

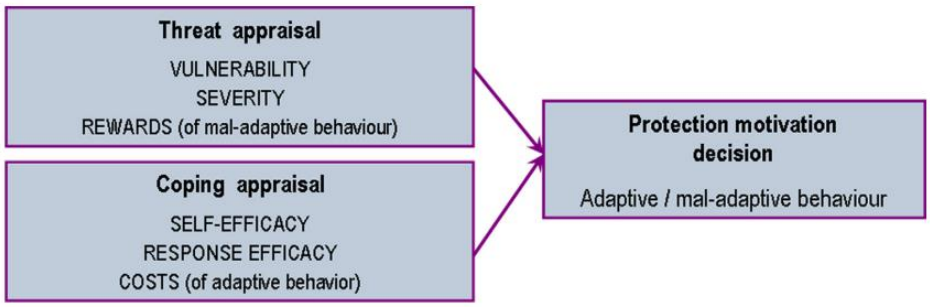

Figure 7 Conceptual Model of The PMT (Bockarjova & Steg 2014)

Janmaimool, (2017) used this conceptual model to investigate sustainable waste management behaviors as we can see in Figure 8 Conceptual Model of PMT And Sustainable Waste Management Behavior (Janmaimool, 2017).

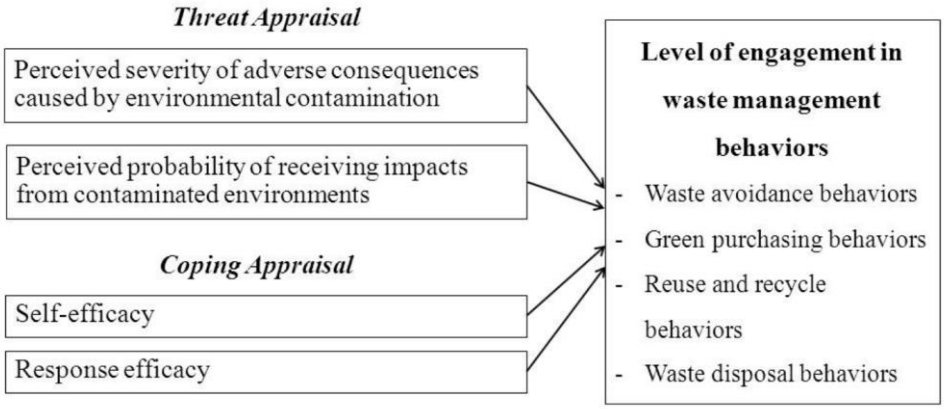

Figure 8 Conceptual Model of PMT And Sustainable Waste Management Behavior (Janmaimool, 2017)

For our research, we will adopt this conceptual model as well, but we aim to explore additional motivators, including coping mechanisms and threat appraisals. We believe that various factors could influence consumers' decisions to choose sustainable materials for home renovations or new constructions. We aim to move beyond models that focus solely on individual decision-making based on rational calculations of costs and benefits. Instead, with the inspiration from Hargreaves (2011), Kollmuss & Agyeman (2002), Onwezen, Antonides, & Bartels (2013) and Klöckner (2013) we would like to acknowledge the role of deeper, more complex factors in shaping environmental behavior. They collectively emphasize that effective strategies for promoting environmental conservation should consider psychological, social, emotional, and other components (Hargreaves, 2011; Kollmuss & Agyeman, 2002; Onwezen, Antonides, & Bartels, 2013; Klöckner, 2013). In the following section, we will review the literature to pinpoint the motivations driving consumers towards sustainability.

4 The Most Common Motives for Adopting Pro-Environmental Behaviors

In this section of our literature review, we explore the motivations behind choosing sustainable practices, especially in home renovations and building, highlighted in various studies. These studies examine mainly reducing energy consumption efforts like using less electricity (Park & Kwon, 2017), waste management through recycling (Janmaimool, 2017), and choosing solar panels or heat pumps to support the environment and save money (Schelly, 2014; Gręboszc-Krawczyk et al., 2021; Meles & Ryan, 2022).

Our focus is to understand the reasons behind these eco-friendly choices, influenced by various factors, for example environmental awareness and the negative impacts of not sustainable practices (Schelly, 2014; Häkkinen & Belloni, 2011), economic factors such as cost savings and financial incentives (Palm, 2018; Jowkar et al., 2022), personal and psychological drivers including individual beliefs and self-efficacy (Black & Cherrier, 2010; Janmaimool, 2017), social influences like community involvement and social responsibility (Park & Kwon, 2017; Leslie et al., 2021), and practical considerations such as convenience and technological interest (Leslie et al., 2021; Schelly, 2014). This review aims to identify the factors, besides the PMT Constructs, that might motivate individuals to choose sustainable practices when building or renovating their home.

4.1 Economic and Regulatory Motivation

Many studies consistently emphasize that financial incentives are the primary motivator to adopt sustainable behavior. We can understand financial incentives as general economic benefits gained from to sustainable practices as well as immediate cost savings (Palm 2018; Jowkar et al., 2022). However, financial motivation for sustainable practices also includes various factors, including the expenses involved in implementation and maintenance, as highlighted by Meles & Ryan (2022). In their study, they mention that economic factors are, among others, very important when encouraging sustainable behaviors like adoption of heat pumps. Financial support also plays a significant role. People are motivated when monetary benefits or subsidies are provided to encourage sustainable practices (Gręboszc-Krawczyk, 2021). These subsidies are closely linked with the standards and objectives established by states or international bodies like EU to support sustainability. Consequently, the economic incentive is directly tied to regulatory and normative motivations, including compliance with legal and normative frameworks that promote sustainability, as highlighted in the research by Häkkinen & Belloni (2011). Through the investigation into the barriers and motivations for Sustainable Building Renovations (SBR) from house-owners' perspectives in Norway Jowkar et al. (2022) highlight the economic barriers and incentives in sustainable building renovations. They also outline the importance of cost considerations. Savings of energy are also important part of economic motivation. Energy savings bring both economic and environmental benefits through reduced energy consumption. They are highlighted in the work of Jowkar et al. (2022) but as well - broader economic benefits, including cost savings resulting from sustainable actions, are major consideration in the study conducted in Sweden by Palm (2018).

Economic incentives and disincentives are crucial in shaping pro-environmental behaviors. High costs or perceived inconvenience can discourage from environmentally friendly decisions, whereas economic incentives can significantly encourage such behaviors (Kollmuss & Agyeman, 2002). This

phenomenon is illustrated in Figure 9 Low-Cost High-Cost Model of Pro-Environmental Behavior (Kollmuss & Agyeman, 2002) below.

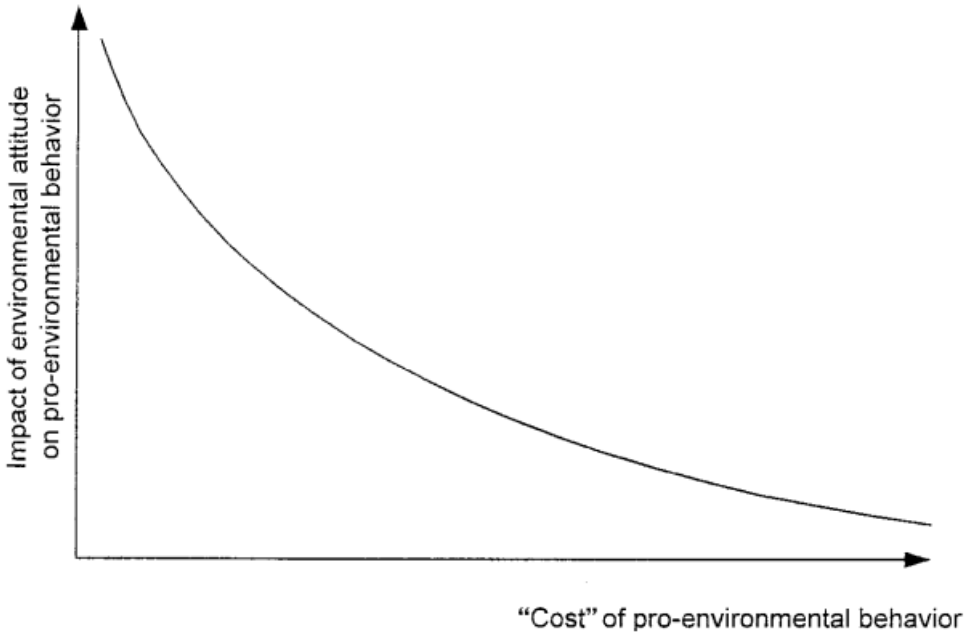

Figure 9 Low-Cost High-Cost Model of Pro-Environmental Behavior (Kollmuss & Agyeman, 2002)

Nevertheless, studies interpret the role of economic factors as motivators for sustainable behavior differently. Some researchers, like Barreto et al. (2014), argue that economic considerations, especially cost savings, are primary motivators in driving sustainable behavior. These studies highlight the significant influence of financial benefits in promoting eco-friendly practices. In contrast, in the article by Meles and Ryan on the adoption of renewable home heating systems, specifically focusing on heat pumps in Ireland, economic motivation is not considered as the most crucial factor influencing the decision to adopt these heat pumps. The authors present the influence of economic factors alongside with psychological factors and social networks. They integrated factors such as consumer attitudes, social influences, and financial considerations. The findings suggest that while economic factors like cost savings and financial incentives are important, they are not sufficient on their own to encourage adoption. Psychological factors, such as individual attitudes towards technology and perceived ease of installation and social influences, for example how individuals are affected by their networks and the actions of their friends, also play significant role in the decision-making process.

Our research will also examine the impact of the economic and regulatory motivators highlighted in our literature review to understand their influence on homeowners' decisions to adopt sustainable practices in building and renovation. In our study, we will investigate the influence of costs of buying and maintenance, financial incentives, energy savings and the role of regulations and normative goals to test our first two hypotheses:

Hypothesis 1: Economic motivators drive consumers to choose sustainable options when building or renovating their homes.

Hypothesis 2: Regulatory motivators drive consumers to choose sustainable options when building or renovating their homes.

4.2 Environmental Motivation

The topic of many studies are environmental issues and their important function in stimulating sustainable behavior. These studies are examining sustainable practices such as waste management, reducing energy consumption, and the renovation of sustainable buildings. Regarding the environment, the motivation often originates from a concern and awareness about the negative impacts on the environment. This motivation can eventually lead to actions that minimize these effects. Aspects like these are thoroughly explored by Schelly (2014) and Häkkinen & Belloni (2011). Leslie et al. (2021), for instance, in their study about the three Rs of sustainability—reduce, reuse, recycle, highlight that increased awareness of environmental issues and the potentially harmful effects on health and well-being can significantly motivate people to adopt more sustainable practices, such as reduction and reuse.

Not less important is the concept of environmental consciousness. This concept reflects an individual's understanding and willingness to address environmental issues, and it is discussed by Arroyo & Carrete (2019). They investigated the impact of various goal triggers on the intention to purchase green energy, specifically solar systems, among households in a major city in central Mexico. Barreto et al. (2014) highlights the environmental advantages for families as the main driver in sustainable behavior, along with financial gains. The positive environmental outcomes resulting from sustainable actions, termed as environmental benefits, are also a crucial factor, as seen in the research by Palm, J. (2018). Moreover, the impact of actions on environmental health and sustainability, termed as environmental impact, is considered in the studies by Barreto et al. (2014) and Janmaimool (2017).

As far as the influence of environmental knowledge is concerned, perspectives may differ among different authors. On one hand, studies by Jowkar et al. (2022) and Arroyo & Carrete (2019) suggest that an increase in environmental knowledge positively influences sustainable behavior, claiming that greater awareness leads to more eco-friendly actions. On the other hand, the research by Park & Kwon (2017) has a contrasting perspective, claiming that knowledge alone may not necessarily drive action in energy-saving behavior. Their findings show that environmental knowledge plays a weak role in motivating the actual use, intention, and perceived value of energy-saving products. Instead, the study outlines that factors such as social responsibility and perceived benefits are important in promoting positive intentions and actual usage of these products. In this context, knowledge alone may not be a strong motivator for action.

Based on our insights on environmental motivation from this literature review, we propose our second hypothesis. We will investigate how a sufficient awareness and concern for environmental impacts influence the choices consumers make in the field of sustainable home building and renovation:

Hypothesis 3: Environmental concerns prompt consumers to adopt sustainable practices in home building and renovation.

4.3 Social Motivation

Social motivation involves various elements, such as social responsibility, where individuals are motivated to act in ways that benefit society and set positive examples, as discussed by Park & Kwon (2017) and Barreto et al. (2014). Park & Kwon (2017) outline the importance of consumers' social responsibility in South Korea as a driving force behind energy-saving behavior. The influence from social networks and peers in encouraging sustainable practices, known as social pressure, is a key factor explored by Leslie et al. (2021). Furthermore, the impact of social networks and the perceived value of actions that benefit society, termed social value, is emphasized in research by Gręboszˑ-Krawczyk (2021). This study's results however, showed that the impact of social value was not statistically significant ($p > 0.05$). Another perspective has Schelly (2014) who emphasizes the impact of community engagement and information sharing on the adoption of solar electricity.

Connecting interesting findings around social motivations from the studies in our literature review, we formulate the Hypothesis 3. We will explore if social factors, such as responsibility and community influence, drive consumer decisions in adopting sustainable practices in their building and renovation projects.

Hypothesis 4: Social factors are significant in motivating consumers towards sustainable building and renovation options.

4.4 Personal/Psychological Motivation

Personal and psychological motivation includes elements like personal identity, which refers to the influence of individual beliefs, values, and self-conception on sustainable behaviors, as explored in the study about anti-consumption by Black & Cherrier (2010). Self-efficacy, the confidence in one's ability to effectively engage in sustainable practices, is discussed in the study by Janmaimool (2017). The study's most important aspect is its application of Protection Motivation Theory (PMT) to explore how individual perceptions of threat and coping abilities influence engagement in sustainable waste management behaviors. We think that self-efficacy is not only one of the PMT constructs but also, based on the definition of self-efficacy, which starts with "confidence in one's ability", and according to the results of İhsan et al. (2015), self-confidence was found to be positively and significantly correlated with intrinsic motivation. Intrinsic motivation is described as a psychological state by Larson & Rusk (2011). Based on this knowledge, we categorized self-efficacy as a personal/psychological motivator.

Meles & Ryan (2022) highlight other psychological factors, including attitude towards heat pumps, perceived behavioral control and subjective norms. The work of Mastria et al. (2023) explores how anticipated emotions—emotional responses expected from engaging in sustainable behaviors—play a crucial role in psychological motivation towards environmental sustainability. This investigation brings to the light significant influence of these expected emotional outcomes on individuals' willingness to adopt sustainable practices.

Drawing from the insights on personal and psychological motivations in our literature review, we formulate Hypothesis 4. We aim to examine how beliefs, personal identity, anticipated emotions, and self-efficacy influence preferences for sustainable building practices.

Hypothesis 5: Personal and psychological factors influence consumer preference for sustainability in building or renovating their homes.

4.5 Cognitive-Practical Motivation

Cognitive-Practical Motivation includes the motivation to acquire knowledge with the intention of applying it in a way that is tangible and beneficial, aligning closely with actions that are informed and effective (Sheikhmiri, M. & Issa, T., 2020). Practical and operational motivation is closely connected with the knowledge and awareness about the benefits of practices, technologies and tools linked with sustainable actions. Jowkar et al. (2022) point out that insufficient information about the practical benefits of sustainable renovations can be a major barrier, suggesting that higher awareness could lead to increased adoption of such projects. Similarly, Arroyo & Carrete (2019) note that personal awareness and concern for the environment are influential in the decision to adopt green energy. Additionally, the belief in the effectiveness of one's actions, known as response efficacy, is a factor considered in Janmaimool's (2017) research. Awareness and knowledge about environmental issues and sustainable practices are also discussed by XW Zou & J. Yang (2014) and Hafez et al. (2023). In examining awareness and knowledge about environmental issues, XW Zou & J. Yang (2014) used a methodology focused on the assessment of sustainability practices within the construction industry, using surveys or case studies to increase awareness levels and the impact of knowledge spreading on sustainable construction methods. Hafez et al. (2023), on the other hand, have approached the topic through the lens of energy efficiency in sustainable buildings, using a combination of empirical research and analytical models to explore the relationship between informed awareness, knowledge application, and energy-saving behaviors.

Factors such as convenience, along with a clear understanding of usage, and the ease and practicality of sustainable practices, play a crucial role in their adoption, as highlighted by Leslie et al. (2021). They also discuss how an understanding of environmental issues can motivate individuals towards sustainable actions. Another aspect of cognitive-practical motivation is technological interest. The interest in technical aspects of sustainable technologies is explored by Schelly (2014).

Linking the review on cognitive-practical motivations to our research aims, we formulated Hypothesis 5. Our exploration will focus on understanding how convenience, knowledge, response-efficacy, and technical interest, shape the willingness of individuals to adopt sustainable building and renovation practices.

Hypothesis 6: Cognitive-practical motivation facilitate consumer inclination towards sustainability when building or renovating their homes.

4.6 Conceptual Model

The hypotheses formulated in the previous section of our literature review form our conceptual model, which illustrates different motivations influencing the decision of a consumer to adopt sustainable practices in home building or renovation. The motivations include economic, regulatory,

environmental, social, personal/psychological, and cognitive-practical factors. The conceptual model is depicted in the Figure 10.

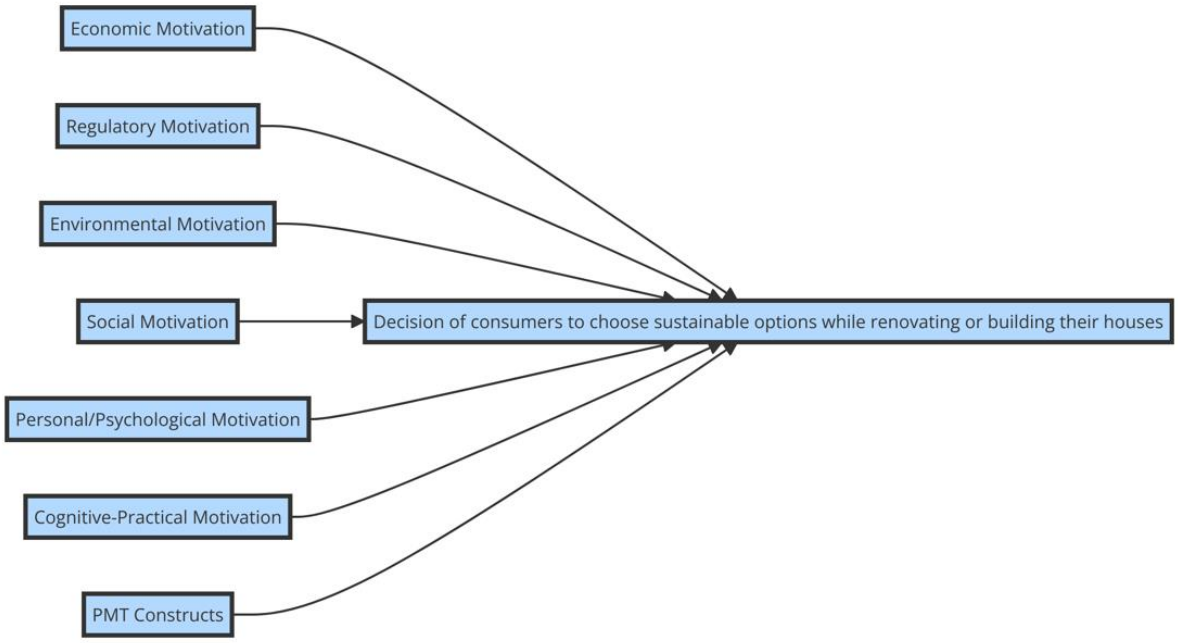

Figure 10 Conceptual Model of this study

4.7 Overview of Possible Motivators for Sustainable Behavior

Table 1 Overview of Motivators provides an overview of above-mentioned motivators for sustainable behavior:

Category	Motivators	Reference
Economic and Regulatory	Cost, Financial Incentives, Economic Benefits, Economic Factors, Energy Savings, Regulations, Standards, Normative Goals	(Meles & Ryan, 2022; Häkkinen & Belloni, 2011; Leslie et al., 2021; Palm 2018; Jowkar et al., 2022; Grębosz-Krawczyk, 2021)
Environmental	Environmental Concern, Environmental Benefits, Environmental Consciousness, Environmental Impact	(Barreto et al., 2014; Mastria et al., 2023; Schelly, 2014; Häkkinen & Belloni, 2011; Arroyo & Carrete, 2019; Janmaimool, 2017)
Social	Social Responsibility, Social Engagement, Social Pressure, Social Networks, Social Value	(Barreto et al., 2014; Park & Kwon, 2017; Jowkar et al., 2022; Leslie et al., 2021; Meles & Ryan, 2022; Grębosz-Krawczyk, 2021)
Personal/ Psychological	Personal Identity, Beliefs, Self-Efficacy, Psychological Factors, Anticipated Emotions	(Black & Cherrier, 2010; Janmaimool, 2017; Mastria et al., 2023; Meles & Ryan, 2022)
Cognitive-practical	Convenience, Awareness, Knowledge, Technical Interest, Response Efficacy	(Leslie et al., 2021; Mastria et al., 2023; Schelly C. 2014; Hafez et al., 2023; XW Zou & J. Yang, 2014; Janmaimool, 2017)

Table 1 Overview of Motivators

Each of these motivations, whether economic, regulatory, environmental, social, personal, or practical, might play a crucial role in the push towards sustainable practices and decision-making.

In the Protection Motivation Theory (PMT), coping appraisal and threat appraisal are the key elements through which individuals evaluate potential threats and their capacities to handle them. Coping appraisal, as described by Kothe et al. (2019), reflects the individual's assessment of their ability to effectively manage or minimize a threat. People focus in the coping appraisal on their confidence (self-efficacy) and the perceived effectiveness (response efficacy) of their protective actions, alongside the costs associated with these actions. On the other side, threat appraisal involves an assessment of the perceived severity and susceptibility of the threat, as well as the potential rewards for not adopting protective behaviors. These could lead to maladaptive responses such as avoidance or denial (Norman et al., 2015).

With this understanding, we aim to classify motivational factors from Table 1 into categories of threat and coping appraisals. Economic and regulatory factors are seen as threat appraisals, emphasizing external pressures and perceived risks. Environmental motivators also fall under threat appraisal,

highlighting awareness of environmental risks. Personal and psychological factors, alongside cognitive-practical factors, are categorized as coping appraisals, focusing on internal beliefs and capacities that encourage protective actions. Social factors are unique because they can affect both threat and coping appraisals, increasing the perceived severity of threats, or strengthening the individual's ability to cope, depending on the social context.

By incorporating this classification, we are enriching the Protection Motivation Theory (PMT) framework with new constructs. This approach is inspired by the work of Shafiei A. & Maleksaeidi H. (2020), who introduced additional constructs, such as environmental attitude, into PMT. Their research demonstrated the value of integrating novel constructs into the framework to improve its effectiveness in predicting protection motivation behaviors.

The conceptual model, which integrates additional constructs, is depicted in Figure 11 Conceptual Model with Threat and Coping Appraisal below.

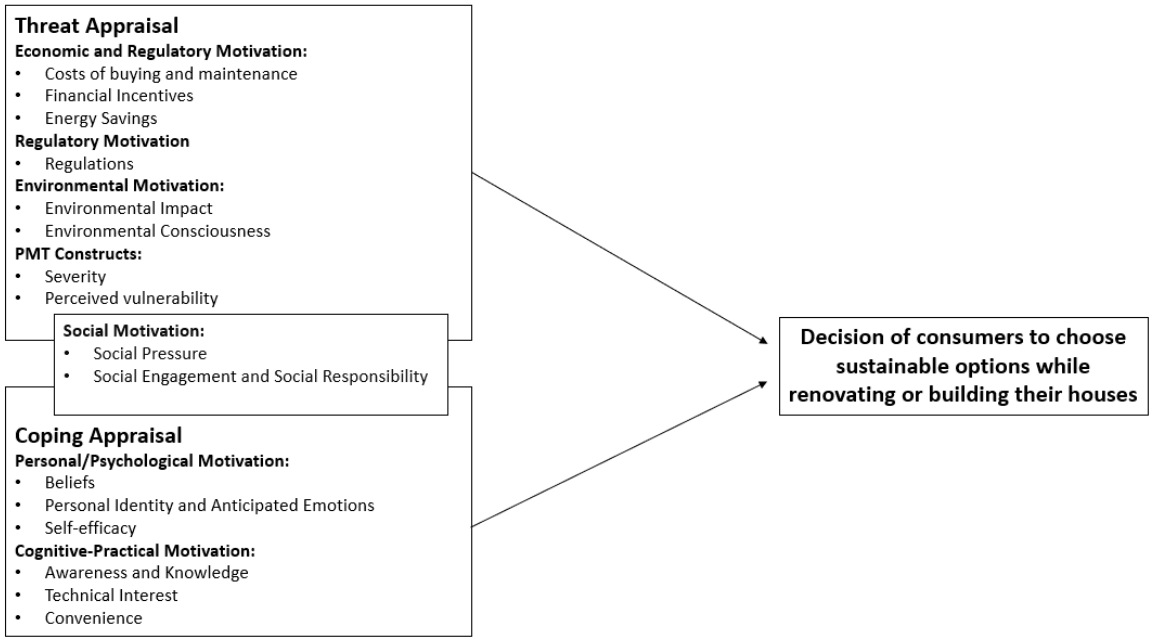

Figure 11 Conceptual Model with Threat and Coping Appraisal

We aim to validate our categorization of these factors into threat and coping appraisals (categorization which we did not find an existing literature foundation for). We will employ an analysis of internal consistency. This approach could provide valuable insights and serve as an inspiration for further research in this domain.

However, in our study our priority is to explore how different categories of factors may individually affect the decision to choose sustainable materials for home renovation and building projects.

5 Gaps in the literature

While already existing research has focused on the broad aspects of sustainable building practices, there is a lack of studies specifically investigating the context of Slovakia and its engagement with sustainable building materials. Existing literature to the large extend covers the general motivations, benefits, and challenges of sustainable practices, as well as those specific to different regions. However, a detailed exploration of these factors in Slovakia remains not explored. Our study aims to address this gap by exploring the factors that motivate individuals in Slovakia to choose sustainable options when building or renovating their homes.

We acknowledge that studies employing Protection Motivation Theory (PMT) have brought significant insights into understanding the motivations behind protective behaviors, including those related to environmental conservation. However, PMT does not explicitly incorporate constructs such as environmental consciousness, awareness, or other personal and psychological aspects that are crucial in shaping behaviors toward sustainability. Many studies have used the PMT conceptual model as it is but have not added constructs that could be crucial in understanding why individuals make environmentally friendly choices, especially in contexts as significant as home renovations and new constructions, where decisions have long-lasting impacts on the environment.

6 Methodology

In this chapter, we present the methodology employed to investigate our research question and test our hypothesis. We will detail the steps, tools, and analytical techniques used for our data collection and analysis.

6.1 Population and Sampling

This section describes the study's participants and the sampling method used.

6.1.1 Population

The target population for this study are individuals residing in Slovakia who have either renovated or constructed their homes within the past ten years. This timeframe ensures that the responses regarding the construction or renovation processes will be relevant and current as the respondents also have the experiences and awareness of the outcomes.

6.1.2 Sampling

The study focuses on a specific activity (home renovation or construction) within a defined period; therefore, a convenience sampling method will be used. This approach is based on selecting participants who are relevant, readily accessible, and willing to participate. While this method may not cover the whole population, it is efficient for studies with specific criteria and limited resources (Sekaran & Bougie, 2016).

6.2 Data Collection Instrument

This section details the tools and methods used to collect data for the study, covering Survey Design, Survey Ethics, Survey Distribution, and the Data Collection Timeline.

6.2.1 Survey Design

This study employs a quantitative research design. An online survey designed utilizing Qualtrics software will be used as the primary tool for data collection. The survey will include Likert scale questions and demographic questions. Likert scale questions will be used to measure the motivations behind consumers' choices of sustainable materials in the context of home construction and renovation in Slovakia. The questionnaire is divided into seven sections, each targeting a specific aspect of motivational factors, including economic, regulatory motivations, environmental motivations, social motivations, personal/psychological motivations, cognitive-practical motivations and PMT constructs. The structure of the questionnaire into distinct categories/sections was inspired by the approach adopted by Janmaimool, P. (2017), who divided their questionnaire into four specific categories. Each section includes a series of statements related to the respective motivational factor. Respondents are required to express their level of agreement with these statements by using a 5-point Likert scale. This scale ranges from 1, representing "Totally disagree", to 5, representing "Totally agree". This method allows participants to clearly indicate how strongly they agree or disagree with each statement provided in the survey. The decision to employ a 5-point Likert scale for capturing responses was inspired by the successful application of similar measurement scales in the studies conducted by Shafiei A. & Maleksaeidi H. (2020), Janmaimool, P. (2017), and Meles & Ryan (2022).

The design of the questionnaire was significantly informed by a review of existing literature on the subject. This was ensured because each item and scale employed was either directly adopted from

or inspired by previous studies. Below is an overview of the main sections of the questionnaire, the aspects they aim to measure, and the sources from which they were adopted:

Section name:	Questions about:	Based on:
Economic and Regulatory Motivation	Costs of Buying and Maintenance	Häkkinen & Belloni, 2011
	Financial Incentives	Gręgosz-Krawczyk (2021)
	Energy Savings	Meles & Ryan, 2022, Gręgosz-Krawczyk (2021)
	Regulations	Shafiei A. & Maleksaeidi H. (2020), Gręgosz-Krawczyk (2021)
Environmental Motivation	Environmental Impact	Shafiei A. & Maleksaeidi H. (2020), Mastria et al., 2023
	Environmental Awareness and Consciousness	Mastria et al., 2023
Social Motivation	Social Pressure	Barreto et al., 2014
	Social Engagement and Social Responsibility	Shafiei A. & Maleksaeidi H. (2020), Barreto et al., 2014
Personal/Psychological Motivation	Beliefs	Mastria et al., 2023
	Personal Identity and Anticipated Emotions	Mastria et al., 2023
	Self-efficacy	Shafiei A. & Maleksaeidi H. (2020)
Cognitive-Practical Motivation	Knowledge	Häkkinen T. & Belloni K. (2011), Mastria et al., 2023
	Technical Interest	Palm (2018), Schelly (2014)
	Convenience	Palm (2018), Gręgosz-Krawczyk (2021)
	Response Efficacy	Shafiei A. & Maleksaeidi H. (2020)
PMT constructs	Severity	Shafiei A. & Maleksaeidi H. (2020)
	Perceived Vulnerability	Shafiei A. & Maleksaeidi H. (2020)
Demographics	Gender, Age	Shafiei A. & Maleksaeidi H. (2020), Janmaimool P. (2017)

Table 2 Resources for Survey Questions

The survey concludes with demographic questions that gather information about the respondents, such as age and gender identity.

6.2.2 Survey Ethics

The introduction of the questionnaire includes a brief overview of the study's purpose, emphasizing its focus on understanding consumer motivations for selecting various options in home building and renovation. It also contains a GDPR statement to ensure participants' informed consent regarding the use of their data for research purposes. Informed consent is also secured by explaining expected duration of the questionnaire. Participants will be made aware that their involvement was voluntary, and they can exit the questionnaire at any time without penalty. To protect confidentiality and anonymity, the survey is designed without any questions regarding names or other personal data (Nunan, Birks & Malhotra, 2020).

6.2.3 Survey Distribution

The online survey will be distributed via email to a carefully selected individuals who meet the study's criteria. Participants will be informed about the survey's purpose, its anonymous nature, and how their responses will contribute to a better understanding of factors which motivate consumers in Slovakia to choose sustainable options while renovating or building their houses. To increase the number of responses, the survey will be designed to be concise, with clear instructions and an estimated completion time provided upfront (Nunan, Birks & Malhotra, 2020).

6.2.4 Data Collection Timeline

The data collection phase for the online survey is set to last for two weeks starting on 22.03.2024, due to the limited timeframe available for the completion of this master's thesis. We will ensure the collection of enough responses within this limited timeframe.

6.3 Data Analysis Procedure

The data collected from the online survey will be transformed into SPSS for analysis. Following steps will be taken data preparation, conducting descriptive statistics, factor and reliability analysis for each construct, correlation analysis and multiple regression analysis to test the hypotheses (Sekaran & Bougie, 2016).

6.3.1 Data Preparation

The initial step in the analysis is cleaning the dataset which ensures the data quality and reliability. This will include removing of the incomplete responses. Missing age values will be replaced by using the average age of the respondents, while missing data about gender will be filled by using the most frequently occurring category (Sekaran & Bougie, 2016). To verify the absence of outliers that could skew the results, the Mahalanobis distance test will be employed. Certain questions in the survey sections Awareness, Knowledge, and Technical Interest are with the reverse phrasing. These items will be recoded which will ensure that all responses are aligned for consistent analysis (Sekaran & Bougie, 2016).

6.3.2 Factor Analysis

The objective of the factor analysis will be to confirm if the constructs within the dataset really represent different sections of the questionnaire, such as Economic, Regulatory, Environmental, Social, Personal/Psychological, Cognitive-Practical motivations or PMT Constructs. Initial reliability testing using Cronbach's Alpha will highlight which sections do not meet the acceptable threshold for

internal consistency. An appropriate level of internal reliability, judged based on Cronbach's alpha, should be above 0.70 (Kennedy, 2003).

Confirmatory factor analysis will then be conducted for sections where Cronbach's Alpha is below 0.7. This involves reassessing the factor structure and eliminating items with low communalities (extraction values below 0.4). Adjustments to the factor loadings and composition based on these analyses will improve the overall reliability scores and provide a clearer interpretation and grouping of factors (Nunan, Birks & Malhotra, 2020). The final factor structure will be confirmed through a Component Matrix, which will show how variables load onto specific factors.

We will employ Cronbach's alpha to test the internal consistency of our categorized factors into threat and coping appraisals, as illustrated in Figure 11 Conceptual Model with Threat and Coping Appraisal (Nunan, Birks & Malhotra, 2020).

6.3.3 Descriptive Statistics and Distribution of the Data

Descriptive statistics will be calculated for each motivational factor to understand the central tendencies and variabilities. This will include minimum, maximum, mean, and standard deviation values for each factor. Histograms and normality tests (Kolmogorov-Smirnov and Shapiro-Wilk) will be used to assess the distribution of scores across different factors. This step will be important for determining the appropriateness of subsequent parametric tests, considering the evidence of skewness and kurtosis in some distributions (Nunan, Birks & Malhotra, 2020).

6.3.4 Correlation Analysis

Correlation analysis will be performed to explore the relationships between the identified factors. A correlation matrix will be used to illustrate these relationships. Significant correlations at different levels ($p < 0.01$ and $p < 0.05$) will be highlighted. The strength of each correlation will be categorized into weak, medium, or strong based on the established thresholds (Nunan, Birks & Malhotra, 2020).

6.3.5 Multiple Regression Analysis

To examine the relationship between the choice of sustainable materials (dependent variable) and various motivational factors (independent variables), multiple regression analysis will be conducted. This analytical approach is inspired by the work of Janmaimool P. (2017), who successfully employed multiple regression analysis to examine how attributes of the Protection Motivation Theory (PMT) influence various types of Sustainable Waste Management Behaviors. This study outlines the efficacy of multiple regression analysis in testing the impact of multiple predictors on a specific outcome. Therefore, we apply this approach in this study to assess the influence of motivational factors on the choice of sustainable building materials.

Composite scores will be created by averaging responses to items within each factor, serving as independent variables in the regression model. To conduct a regression analysis, we will average the respondent's score on each item to create composite score, thus creating a new variable. This new dependent variable represents the likelihood of respondents choosing sustainable options (Nunan, Birks & Malhotra, 2020).

As these authors Nunan, Birks & Malhotra (2020) suggested in their book, a series of equations will be used to individually assess the influence of various motivators on the choice of sustainable options. Each equation takes the following form:

Choice of sustainable options = α + Mi + ε

where M_i ranges from 1 to 7, representing each motivator separately. In these equations, α is the intercept, indicating the baseline level of choosing sustainable options when the motivator M_i is zero. M_i represents one of the seven distinct motivators examined, one per equation. ε is the error term, which accounts for all other variations not explained by the motivator in the model. This approach allows us to isolate and analyze the impact of each individual motivator on sustainable decision-making (Nunan, Birks & Malhotra, 2020).

The significance of each factor's influence on decision-making will be assessed through p-values and adjusted R-square values from the regression output. This analysis will help to confirm or refute our hypotheses (Nunan, Birks & Malhotra, 2020).

7 Data Analysis

7.1 Data Preparation

In the phase of cleaning data, we removed incomplete responses. We found two respondents who did not state their age and one who did not state a gender. As these demographics were not the main focus of our research, we decided to fill the blank spots for age with the average age of our respondents, which was 40. One blank spot for gender identity was filled with the median, in our case, female. Based on the Mahalanobis distance test, we did not identify any outliers. Additionally, the shorter times spent on the questionnaire were clarified by the respondents themselves after completion. They mentioned that they accidentally exited the questionnaire early, which led to them finishing it faster when they returned and completed it (Sekaran and Bougie, 2016).

In the sections covering Awareness, Knowledge, and Technical Interest, we reversed the coding of negatively stated questions. These were the second and third questions in Awareness, the fourth and fifth in Knowledge, and the third in Technical Interest.

The data preparation process in our study was conducted following the procedures outlined by Sekaran and Bougie (2016).

7.2 Demographics

The dataset describes age and gender with 50 respondents: ages range from 22 to 70 with an average age of 40. This is depicted in the *Figure 12 Demographics - Age*.

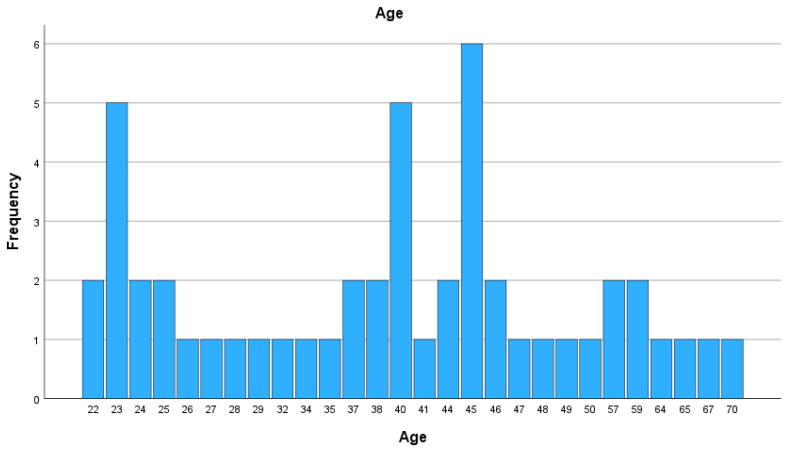

Figure 12 Demographics - Age

As for gender, 40% are men and 60% are women as it is illustrated in the pie chart below (Figure 13 Demographics - Gender)

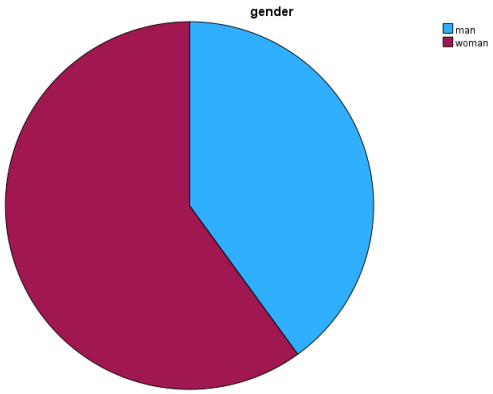

Figure 13 Demographics - Gender

The overview of descriptive statistics is presented in Table 3 Demographics below.

Statistic	Value
Count	50
Minimum Age	22
Maximum Age	70
Mean Age	40.02
Percent Men	40%
Percent Women	60%

Table 3 Demographics

7.3 Factor Analysis

We aimed to group variables into different factors representing distinct sections of the questionnaire. After examining Cronbach's Alpha for each section, we found that not all variables could be grouped into the factors we initially considered. This is illustrated in the Table 4 Cronbach's Alpha before Factor Analysis below (Nunan, Birks & Malhotra, 2020).

Factor Name	Cronbach's Alpha Based on Standardized Items (before factor analysis)
Economic Motivation	0.437
Regulatory Motivation	0.546
Environmental Motivation	0.644
Social Motivation	0.835
Personal/Psychological Motivation	0.751
Cognitive-Practical Motivation	0.649
PMT constructs	0.837

Table 4 Cronbach's Alpha before Factor Analysis

Values above 0.7 are typically considered acceptable, indicating good internal consistency. Values above 0.8 are considered strong. Values below 0.7 might suggest that the items may not be consistently measuring the same construct, or the scale may be too diverse (Kennedy, 2003).

Therefore, we conducted a confirmatory factor analysis for every section whose Cronbach's Alpha was below 0.7, specifically for the economic, regulatory, environmental, and cognitive-practical motivation factors.

Initially, we sought to identify which variables could be integrated into the 'economic motivation' factor with a sufficient Cronbach's Alpha. For the factor analysis, where we anticipated that these variables would all converge into a single factor – 'economic motivation' – the Kaiser-Meyer-Olkin measure was 0.524, indicating the factor analysis was appropriate (Nunan, Birks & Malhotra, 2020).

In the communalities table, we excluded the variables 'costs 1, 2, 3, and 4' because their extraction values were below the cutoff point of 0.40 (Nunan, Birks & Malhotra, 2020) as we can see in Table 5 Communalities - Economic Motivation. Future research should focus on better question formulation regarding costs to include this dimension in our factor analysis.

Communalities

	Initial	Extraction
costs_1	1.000	0.235
costs_2	1.000	0.024
costs_3	1.000	0.248
costs_4	1.000	0.130
incentives_1	1.000	0.670
incentives_2	1.000	0.642
energy_savings	1.000	0.409

Extraction Method: Principal

Table 5 Communalities - Economic Motivation

However, the variance explained by over 60% with our initial variables suggests that they are quite diverse and can be classified into three factors. Therefore, we conducted a confirmatory factor analysis, anticipating three factors, as illustrated in the Table 6 Component Matrix - Economic Motivation below (Nunan, Birks & Malhotra, 2020).

Component Matrix[a]			
	Component		
	1	2	3
costs_1	0.485	0.738	-0.055
costs_2	-0.156	0.071	0.906
costs_3	0.498	0.430	0.222
costs_4	-0.361	-0.340	0.369
incentives_1	0.819	-0.547	0.044
incentives_2	0.801	-0.568	0.052
energy_savings	0.639	0.344	0.177
Extraction Method: Principal Component a. 3 components extracted.			

Table 6 Component Matrix - Economic Motivation

In this table, we can determine the factors onto which the variables are loaded based on the highest value in their row. We observe that only one variable is loaded onto Factor 2 and Factor 3, which led us to decide to retain only the first (more general) factor, as we initially intended, and name this factor 'Economic Motivation'. However, the Cronbach's Alpha based on standardized items was 0.68, which is below the preferred threshold of 0.7. Excluding 'costs 4', which had a lower loading value and whose communalities for a single factor suggested removal, the Cronbach's Alpha increased to 0.756, which is acceptable (Nunan, Birks & Malhotra, 2020).

The variables initially composed for regulatory motivation also exhibited a Cronbach's Alpha lower than 0.7, specifically 0.546. Consequently, we conducted a confirmatory analysis which was perceived appropriate with a Kaiser-Meyer-Olkin measure above 0.5. The communalities indicated that the third variable should be excluded because its value was below 0.40 as we can see in Table 7 Communalities - Regulatory Motivation. Without this variable, Cronbach's Alpha is 0.732 which is acceptable.

Communalities		
	Initial	Extraction
regulations_1	1.000	0.580
regulations_2	1.000	0.711
regulations_3	1.000	0.001
regulations_4	1.000	0.664
Extraction Method: Principal		

Table 7 Communalities - Regulatory Motivation

Environmental motivation also did not reach a Cronbach's Alpha of 0.7, therefore, confirmatory factor analysis was necessary. Upon re-evaluating our questionnaire, we decided to move the first two questions regarding knowledge from the cognitive-practical motivation section to environmental motivation, as they are more concerned with environmental issues than just practical knowledge of sustainable options. With the inclusion of these variables, the Kaiser-Meyer-Olkin measure for the confirmatory factor analysis was 0.676, which is suitable. Based on the communalities, we decided

to exclude 'impact_2' and 'impact_3', as well as 'awareness_1' and 'awareness_3' based on Table 8 Communalities - Environmental Motivation. With the remaining variables, Cronbach's Alpha for this factor reached 0.838.

Communalities		
	Initial	Extraction
impact_1	1.000	0.577
impact_2	1.000	0.025
impact_3	1.000	0.007
impact_4	1.000	0.597
awareness_1	1.000	7.664E-05
awareness_2	1.000	0.538
awareness_3	1.000	0.171
awareness_4	1.000	0.639
Knowledge_1	1.000	0.437
Knowledge_2	1.000	0.471
Extraction Method: Principal Component Analysis.		

Table 8 Communalities - Environmental Motivation

Cognitive-Practical Motivation includes variables such as Knowledge, Technical Interest, Convenience, and Response Efficacy. We will proceed without the first two questions in the Knowledge section, as we have reclassified them into the 'Environmental Motivation' factor. Without these two variables, Cronbach's Alpha decreased to 0.596, prompting us to perform confirmatory factor analysis as well.

The Kaiser-Meyer-Olkin measured for this factor analysis was 0.518, indicating the test was appropriate. Communalities suggested retaining only the variables 'Knowledge 3, 4, and 5' and 'Technical Interest 3' as we can see in Table 9 Communalities - Cognitive-Practical Motivation. With only these variables, Cronbach's Alpha was a sufficient 0.817.

Communalities		
	Initial	Extraction
Knowledge_3	1.000	0.467
Knowledge_4	1.000	0.703
Knowledge_5	1.000	0.671
Technical_Interest_1	1.000	0.238
Technical_Interest_2	1.000	0.246
Technical_Interest_3	1.000	0.526
Convenience_1	1.000	0.041
Convenience_2	1.000	0.000
Responseefficacy_1	1.000	0.069
Responseefficacy_2	1.000	0.003
Responseefficacy_3	1.000	0.000
Extraction Method: Principal Component		

Table 9 Communalities - Cognitive-Practical Motivation

We removed the entire Response-Efficacy section from the Cognitive-Practical section. However, Response-Efficacy is also one of the constructs of the Protection Motivation Theory (PMT). Therefore, we decided to include this section in the 'PMT Constructs' factor. With this inclusion, the factor still maintains a sufficient Cronbach's Alpha of 0.749.

The Cronbach's Alpha for the 'Social Motivation', 'Personal-Psychological Motivation' and 'PMT Constructs' factors was a sufficient, so no further factor analysis was necessary.

The comparison of Cronbach's Alpha for each factor before and after factor analysis, including changes to sections and the exclusion of variables, is depicted in Table 10 Cronbach's Alpha Before and After Factor Analysis below.

Factor Name	Cronbach's Alpha Based on Standardized Items (before factor analysis)	Cronbach's Alpha Based on Standardized Items (after factor analysis)
Economic Motivation	0.437	0.756
Regulatory Motivation	0.546	0.732
Environmental Motivation	0.644	0.838
Social Motivation	0.835	0.835
Personal/Psychological Motivation	0.751	0.751
Cognitive-Practical Motivation	0.649	0.817
PMT constructs	0.837	0.749

Table 10 Cronbach's Alpha Before and After Factor Analysis

With these seven factors, we will conduct correlation and regression analyses. In Table 11 Final Factor Loading below, we present the final allocation of variables to their respective factors following the factor analysis.

Factor	Variables
Economic Motivation	Financial Incentives, Energy Savings
Regulatory Motivation	Regulations
Environmental Motivation	Environmental Impact, Environmental Awareness, Knowledge and Consciousness
Social Motivation	Social Pressure, Engagement and Social Responsibility
Personal/Psychological Motivation	Personal Identity and Beliefs, Anticipated Emotions, Self-efficacy
Cognitive-Practical Motivation	Knowledge, Technical Interest
PMT Constructs	Severity, Vulnerability, Response Efficacy

Table 11 Final Factor Loading

With these variables, we will examine whether the newly created factors load onto coping or threat appraisal, as illustrated in our Figure 11 Conceptual Model with Threat and Coping Appraisal.

As suggested, economic, regulatory, environmental, and social factors lead to the threat proposal, with a Cronbach's Alpha of 0.730. However, since the coping appraisal—comprising Social Motivation, Personal/Psychological Motivation, and Cognitive-Practical Motivation—only achieved a Cronbach's Alpha of 0.521, we decided to perform a factor analysis on the coping appraisal. This analysis showed that Cognitive-Practical Motivation does not load significantly on either Coping (extraction value 0.236) or Threat Appraisal (Cronbach's Alpha with this variable decreased to 0.677). However, the reliability analysis conducted after excluding Cognitive-Practical Motivation still resulted in a Cronbach's Alpha lower than 0.7 (0.661), leading us to conclude that our attempt to add factors to the Coping Appraisal was unsuccessful.

This contribution to the field may serve as a valuable resource or a source of inspiration for further studies on this topic. It can potentially guide future research in refining and validating the PMT framework.

We did not perform reliability or factor analysis on the PMT constructs because these had already been examined and categorized into Coping and Threat Appraisal (Norman et al., 2015; Kothe et al. 2019) and there was no hypothesis in our study concerning these constructs. This classification and further details about the PMT constructs can be found in the chapter 3.2 of our literature review in this document.

7.4 Descriptive Statistics and Distribution of the Data

Table 12 Descriptive Statistics below shows statistical measures for different motivational factors and behaviors. Economic Motivation ranges from a minimum of 2.00 to a maximum of 5.00, with an average of 4.5267 and a standard deviation of 0.61016. Regulatory Motivation has the lowest minimum at 1.00 and a high of 4.67, a mean of 3.2267, and the highest standard deviation of 0.94627. Environmental Motivation shows a minimum of 1.33, a maximum of 4.83, a mean of 3.8033, and a standard deviation of 0.68403. Social Motivation varies from 1.30 to 4.50, with a mean of 3.3180 and a standard deviation of 0.63106. Personal/Psychological Motivation ranges from 1.90 to 4.40, with an average value of 3.4360 and a standard deviation of 0.51260. Cognitive-Practical Motivation ranges from 2.00 to 5.00, with a mean of 4.1400 and a standard deviation of 0.65106.

PMT Constructs have values between 2.56 and 5.00, with a mean of 3.9844 and a standard deviation of 0.47088. Lastly, Sustainable Behavior is measured between 2.53 and 4.37, with a mean of 3.7764 and the smallest standard deviation of 0.42525.

	Minimum	Maximum	Mean	Standard Deviation
Economic Motivation	2.00	5.00	4.5267	0.61016
Regulatory Motivation	1.00	4.67	3.2267	0.94627
Environmental Motivation	1.33	4.83	3.8033	0.68403
Social Motivation	1.30	4.50	3.3180	0.63106
Personal/Psychological Motivation	1.90	4.40	3.4360	0.51260
Cognitive-Practical Motivation	2.00	5.00	4.1400	0.65106
PMT Constructs	2.56	5.00	3.9844	0.47088
Sustainable Behaviour	2.53	4.37	3.7764	0.42525

Table 12 Descriptive Statistics

Based on the book by Nunan, Birks, and Malhotra (2020), we will further analyze the histograms of various factors and determine whether the data are normally distributed or if skewness or kurtosis is present.

Skewness and kurtosis are statistical terms that describe the shape of a data distribution. Skewness looks at whether the shape leans more to one side. If the shape is even on both sides, it has no skewness. If one side stretches out longer than the other, it shows skewness. Positive skewness means the right side is longer, negative skewness means the left side is longer. Kurtosis tells us about how tall and sharp the peak of the shape is compared to a normal bell curve. If the peak is taller and sharper, it has positive kurtosis; if it's flatter, it has negative kurtosis. These measures are crucial because if a distribution deviates significantly from normality in terms of skewness or kurtosis, statistical techniques assuming normal distribution might not be appropriate (Nunan, Birks & Malhotra, 2020).

Figure 14 Histograms for Economic and Regulatory Motivations show the distribution of respondents' responses with a normal curve. Economic are skewed left and higher than the normal curve, suggesting positive kurtosis. Regulatory are skewed right, suggesting negative kurtosis, and the distribution is flatter than the normal curve, suggesting negative skewness.

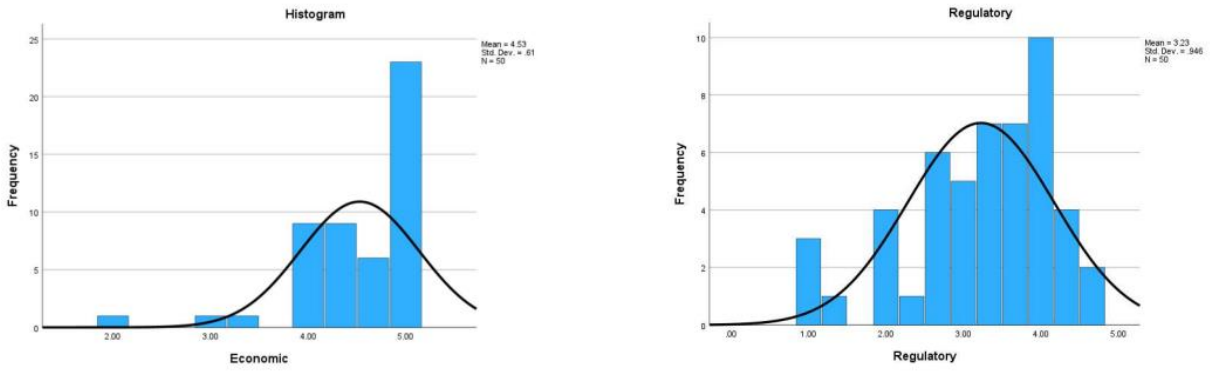

Figure 14 Histograms for Economic and Regulatory Motivations

Figure 15 Histograms for Environmental and Social Motivations show the frequencies of respondents' responses. Environmental motivation responses are somewhat normally distributed but show a slight left skew. Social motivation responses depict a right skew with a peak to the left of center and a longer tail to the right. Both distributions appear to have a single peak and could be considered as normal but with noted skewness.

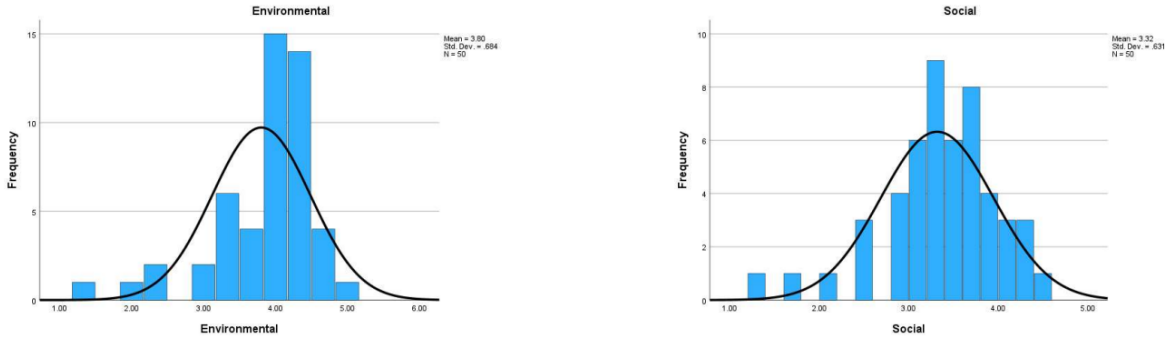

Figure 15 Histograms for Environmental and Social Motivations

Figure 16 Histograms for Cognitive-Practical Motivation and PMT Constructs shows that Cognitive-Practical Motivation on the left has a slight positive skewness, with the longer tail extending towards the higher values, indicating a kurtosis similar to a normal distribution. The PMT Constructs on the right are also positively skewed but show more deviation from symmetry compared to the Cognitive-Practical Motivation. It shows a sharper peak which means that its kurtosis is higher than that of a normal distribution.

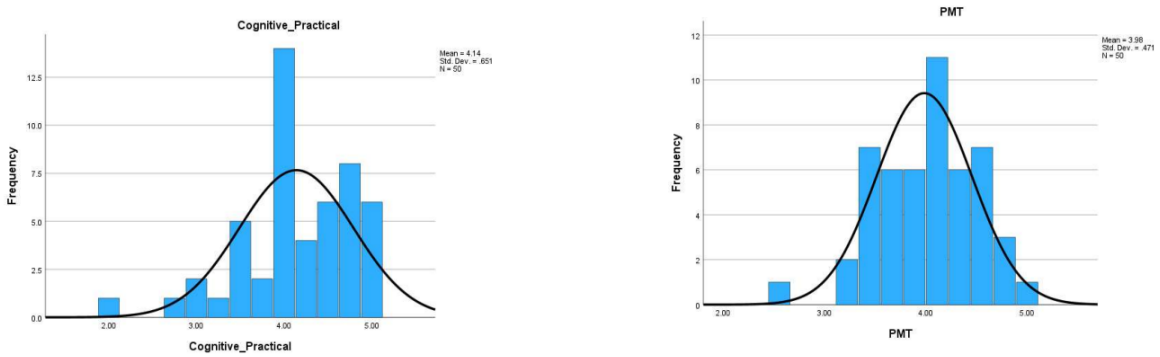

Figure 16 Histograms for Cognitive-Practical Motivation and PMT Constructs

Figure 17 Histogram for Sustainable shows a distribution that is skewed to the right, with a greater frequency of lower scores and the mean (3.78) falling to the right of the mode.

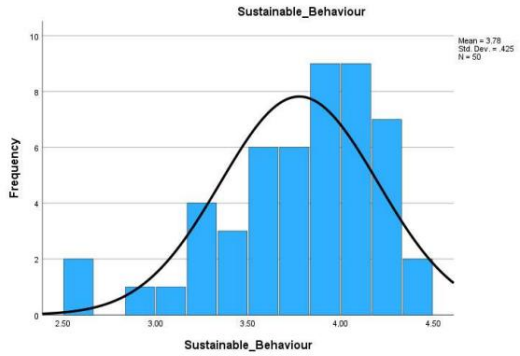

Figure 17 Histogram for Sustainable Behavior

Some of histograms above are indicating a deviation from a normal distribution. These observed skews could affect the robustness of parametric tests, so it is important to assess normality more formally through statistical tests before proceeding with correlation or regression analysis (Nunan, Birks & Malhotra, 2020).

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Economic	0.241	50	0.000	0.755	50	0.000
Regulatory	0.145	50	0.010	0.924	50	0.003
Environmental	0.197	50	0.000	0.871	50	0.000
Social	0.145	50	0.010	0.939	50	0.013
Personal	0.115	50	0.094	0.958	50	0.075
Cognitive_Practical	0.175	50	0.001	0.921	50	0.003
PMT	0.110	50	0.176	0.976	50	0.397

a. Lilliefors Significance Correction

Table 13 Tests of Normality

Table 13 Tests of Normality above presents the results of tests for normality using two different statistical tests: the Kolmogorov-Smirnov test and the Shapiro-Wilk test.

For each variable, the table provides a statistic and a significance value (Sig.). Sig. < 0.05 means that the test is significant, meaning that the data is likely not normally distributed. Sig. > 0.05 shows that the test is not significant, meaning that the data does not significantly deviate from normality and can be considered normally distributed for the purposes of most statistical tests that assume normality (Nunan, Birks & Malhotra, 2020).

Based on the table, Economic, Environmental and Cognitive-Practical Motivation have significance values less than 0.05 for both tests, suggesting that the data for these variables are not normally distributed. Regulatory and Social Motivation also show significance values less than 0.05 in both tests as well, indicating they are likely not normally distributed. Personal Motivation shows a significance value greater than 0.05 in the Shapiro-Wilk test, which suggests that it is normally distributed. PMT Constructs Factor shows significance values greater than 0.05 for both tests, suggesting that the data for this variable does not deviate from normality and can be considered normally distributed.

For regression and correlation analyses, non-normally distributed variables can cause issues, especially if the sample size is small or if the analysis assumes normality (e.g., Pearson's correlation or linear regression). However, if the sample size exceeds 30, the Central Limit Theorem (CLT) allows us to assume that the distribution of the sample means will be approximately normal. For larger sample sizes (commonly, n>30 is considered sufficient), the sampling distribution of the mean will tend to be normal or bell-shaped. This is true even if the underlying population from which the sample is drawn is not normally distributed (Kwak & Kim, 2017). To conclude, even if our data is not normally distributed according to the tests in SPSS, but we have a sample size greater than 30, we are generally able to proceed with methods that rely on normality for the distribution of the sample mean, such as correlation and regression analysis.

7.5 Correlation Analysis

Correlation analysis will be conducted using the correlation matrix below. Table 14 Correlation Matrix is a table showing correlation coefficients between variables. Each cell in the table shows the correlation between two variables. The value of the correlation coefficient ranges from -1 to 1. If the value is close to 1, it indicates a strong positive correlation; if it's close to -1, it indicates a strong negative correlation, and if it's around 0, it indicates no correlation (Nunan, Birks & Malhotra, 2020).

Correlations							
	Economical	Regulatory	Environmental	Social	Personal	Cognitive-Practical	PMT
Economic Motivation	1	0.201	.411**	0.205	0.088	0.273	.345*
Regulatory Motivation		1	.475**	.530**	0.228	-0.094	.434**
Environmental Motivation			1	.701**	.548**	0.275	.625**
Social Motivation				1	.504**	0.106	.643**
Personal/Psychological Motivation					1	0.246	0.172
Cognitive-Practical Motivation						1	.320*
PMT Constructs							1

Table 14 Correlation Matrix

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

The cells of the matrix are highlighted based on Table 15 Correlation - Strength of Relationships below. Yellow cells are in the range of 0.10 to 0.29, signifying a weak correlation. Orange-highlighted cells signal a medium relationship between variables, representing values from 0.30 to 0.49. A strong correlation is represented by values from 0.50 to 1 and is highlighted green. When the cell is uncolored, it indicates that no correlation was found.

Correlation Coefficient (absolute value)	Strength of Relationship
Between 0.10 and 0.29	Small/weak
Between 0.30 and 0.49	Medium
Between 0.50 and 1	Large/strong

Table 15 Correlation - Strength of Relationships (Nunan, Birks & Malhotra, 2020)

In our data, the significance (p-value) is set at 0.01 for strong significance (noted by "**") and 0.05 for moderate significance (noted by "*"). Correlations with p-values above 0.05 are not considered

statistically significant in our dataset (Nunan, Birks & Malhotra, 2020). The number of observations (N) for each correlation is 50, which provides a decent sample size for statistical analysis.

In summary, the correlation analysis reveals key associations among the variables. Economic Motivation is significantly moderately tied to Environmental Motivation (r = 0.411) at the 0.01 level and PMT Constructs (r = 0.345) at the 0.05 level. There is not significant weak correlation between Economic Motivation and Cognitive-Practical (r = 0.273), Social (r = 0.205) and Regulatory Motivation (r = 0.201). There is no correlation between Economic Motivation and Personal Motivation.

Regulatory Motivation demonstrates strong connections, particularly with Social Motivation (r = 0.530) at the 0.01 level. It has significant medium connection with Environmental Motivation (r = 0.475) and PMT constructs (r = 0.434) both with the 99% significance level. There is no relationship between Regulatory and Cognitive-Practical Motivation.

Environmental Motivation is displaying strong correlations with Social Motivation (r = 0.701), PMT constructs (0.625) and Personal Motivation (r= 0.548) with the 99% significant level indicating a strong link between environmental concerns, social factors, and personal factors. It also shows that environmental motivation is strongly connected with Protection Motivation Theory, suggesting that protective motivations are relevant to environmental concerns. There is only weak relationship between Environmental Motivation and Cognitive-Practical Motivation.

Social Motivation also shows a significant strong correlation with PMT Constructs (r= 0.643) and Personal/Psychological Motivation (r = 0.504) at the 0.01 level, suggesting that social drivers are closely associated with Protection Motivation Theory and with personal/psychological factors as well. Social Motivation has insignificant weak relationship with Cognitive-Practical Motivation.

Besides relationships mentioned above, Personal Motivation also shows insignificant weak relationships with Cognitive-Practical Motivation (r=0.246) and PMT Constructs (r= 0.172).

PMT Constructs show a significant moderate connection with Cognitive-Practical Motivation (r = 0.320) with the 95% significance level. In contrast, Economic Motivation, Regulatory Motivation, and other motivations show less significant or no correlation with Cognitive-Practical Motivation. This indicates a weaker relationship with this specific motivation.

7.6 Regression Analysis

We asked multiple questions about how important each factor (economic, regulatory, environmental, social, personal/psychological, cognitive-practical, and PMT constructs) is in respondent's decision-making process for sustainable home building or renovation. To conduct a regression analysis, we averaged the respondent's score on each item to create composite score, thus creating a new variable. This new dependent variable represents the likelihood of respondents choosing sustainable options following the procedures outlined by Nunan, Birks & Malhotra (2020).

In our regression analysis, we used a series of equations to individually assess the influence of various motivators on the choice of sustainable options. Each equation takes the following form as Nunan, Birks & Malhotra (2020) suggested in their book:

Choice of sustainable options = $\alpha + M_i + \varepsilon$

where M_i ranges from 1 to 7, representing each motivator separately. In these equations, α is the intercept, indicating the baseline level of choosing sustainable options when the motivator M_i is zero. M_i represents one of the seven distinct motivators of our examination, one per equation. ε is the error term, which represents the variations that the motivator in the model does not explain. This approach allows us to isolate and analyze the impact of each individual motivator on sustainable decision-making.

Regressions				
	Adjusted R-square	Anova Sig.	Coefficients Sig.	Unstandardized B
Economic Motivation	0.288	<0.001	<0.001	0.374
Regulatory Motivation	0.435	<0.001	<0.001	0.300
Environmental Motivation	0.752	<0.001	<0.001	0.539
Social Motivation	0.632	<0.001	<0.001	0.536
Personal/Psychological Motivation	0.319	<0.001	<0.001	0.478
Cognitive-Practical Motivation	0.179	0.002	0.002	0.276
PMT Constructs	0.557	<0.001	<0.001	0.674

Table 16 Regression Analysis

The p-value is a statistical measure that helps to determine the significance of research results. When the p-value is less than a commonly used threshold of 0.05, the results are considered statistically significant, supporting the hypothesis that there is an effect. In the context of regression, the regression coefficient, represented by "Unstandardized B" in the table above, quantifies the size and direction of the relationship between an independent variable (a motivator) and the dependent variable. A positive coefficient indicates that an increase in the motivator leads to an increase in the likelihood of consumers choosing sustainable options, with the coefficient value specifying the magnitude of change in the dependent variable for each one-unit change in the independent variable. The significance of the regression coefficient, known as "Coefficients Significance", is a p-value for each independent variable in the regression model. It tests whether the coefficient is significantly different from zero. If this p-value is below 0.05, the null hypothesis that there is no effect can be rejected, suggesting that the independent variable has a statistically significant impact on the dependent variable. Table 16 Regression Analysis reveals that all the considered motivators significantly influence consumer decisions, as indicated by the p-values (<.001 and .002) in the ANOVA significance column (Nunan, Birks & Malhotra, 2020).

Environmental Motivation has the highest adjusted R-square value of 0.752, and a regression coefficient of 0.539 suggesting that concerns for the environment are the strongest predictors of sustainable building or renovation practices among consumers. This strongly supports Hypothesis 3, proposing that environmental concerns prompt consumers to adopt sustainable practices.

Social Motivation also has a substantial impact, with an adjusted R-square of 0.632 and a regression coefficient of 0.536 supporting Hypothesis 4 about the significance of social factors in driving sustainable consumer behavior. This result outlines the importance of societal influence, social pressure, and community values in shaping individual decisions regarding sustainability.

PMT Constructs revealed to be a strong motivator with an adjusted R-square of 0.557 and the highest regression coefficient of 0.674, suggesting that protection motivation theory, which contains both threat appraisal and coping appraisal, is a significant predictor of consumers' decisions to engage in sustainable building or renovation practices.

Regulatory Motivation was also a significant factor with an adjusted R-square of 0.435 and a regression coefficient of 0.300, supporting Hypothesis 2 and indicating that policies and regulations play an important role in encouraging consumer choices towards sustainability.

The influence of Personal/Psychological Motivation is also considerable, with an adjusted R-square of 0.319 and a regression coefficient of 0.478, supporting Hypothesis 5 that personal or psychological factors, such as beliefs and anticipated emotions, significantly influence consumer preferences for sustainability.

Economic Motivation showed a moderate effect with an adjusted R-square of .288, providing partial support for Hypothesis 1 (Nunan, Birks & Malhotra, 2020). The regression coefficient of 0.374 suggests that consumers are indeed motivated by economic factors, though not as strongly as by environmental concerns.

Cognitive-Practical Motivation had the least impact among the factors studied, with an adjusted R-square of .179 and regression coefficient of 0.276, suggesting that while cognitive and practical considerations are significant, they are less influential compared to other factors.

In conclusion, the results of this regression analysis suggest that while economic, regulatory, and cognitive-practical factors are important, environmental, social, and personal/psychological factors are more powerful motivators for consumers to choose sustainable home building and renovation options.

7.7 Overview of the Results

In this section, we present the overview of the results of our analysis, including demographics, factor analysis, descriptive statistics, correlation analysis, and regression analysis.

The demographics analysis outlines the age and gender of the study participants, ranging from 22 to 70 years old, with 20 % more females than males.

In the factor analysis, we carefully sorted survey responses into different groups that represent various motivations. This step was key in organizing the data into meaningful categories. We had to exclude some variables and move some variables to the other factors to make sure that these groups were accurate and represented the patterns in the data well. This part of the analysis helped us understand the data better.

The descriptive statistic of our study examines the basic trends and differences within the data, showing the range of responses and common patterns. This part allows us to proceed with deeper analysis while assuming normality.

The correlation analysis identified several key relationships among different motivators. Strong correlations were observed between Environmental Motivation and Social Motivation, suggesting a significant link between environmental concerns and social factors. Social Motivation also showed a

strong association with both Protection Motivation Theory (PMT) Constructs and Personal/Psychological Motivation, highlighting the significant influence of social drivers on protective and personal motivations.

Environmental Motivation was also strongly connected with PMT Constructs and Personal Motivation, suggesting that protective and personal factors are highly relevant to environmental concerns. Regulatory Motivation highlighted strong connections with Social Motivation and significant associations with Environmental Motivation and PMT Constructs.

On the other hand, no significant relationships were found between Economic Motivation and Personal Motivation, as well as between Regulatory Motivation and Cognitive-Practical Motivation. These findings highlight specific areas where motivational constructs do not significantly influence each other.

The Regression Analysis revealed that all our hypothesis were supported:

H1: Economic motivators drive consumers to choose sustainable options when building or renovating their homes.

The p-value for the regression coefficient is <0.001, which indicates a significant effect of economic motivation on the decision to choose sustainable options. The regression coefficient suggests that for every unit increase in economic motivation, there is a corresponding 0.374 unit increase in the likelihood of choosing sustainable options.

H2: Regulatory motivators drive consumers to choose sustainable options when building or renovating their homes.

With a p-value of <0.001 and a regression coefficient of 0.300, this also highlight a significant impact, indicating that regulatory motivations are an influential factor in consumer decisions for sustainability.

H3: Environmental concerns prompt consumers to adopt sustainable practices in home building and renovation.

The analysis reveals a strong and significant effect, represented by a p-value of <0.001 and a regression coefficient of 0.539, which is one of the highest among the motivators, suggesting the considerable influence of environmental concerns on sustainable consumer behavior.

H4: Social factors are significant in motivating consumers towards sustainable building and renovation options.

Similarly significant with a p-value of <0.001 and a regression coefficient of 0.536, this indicates that social factors play a crucial role in encouraging consumers to choose sustainable choices.

H5: Personal and psychological factors influence consumer preference for sustainability in building or renovating their homes.

These factors show a significant influence with a p-value of <0.001 and a regression coefficient of 0.478, suggesting that personal and psychological motivations are important drivers in sustainable decision-making.

H6: Cognitive-practical motivation facilitates consumer inclination towards sustainability when building or renovating their homes.

The p-value here is 0.002, which is above the other motivators but still well below the 0.05 significance threshold, and a regression coefficient of 0.276 indicates a significant effect, although it is less marked compared to the other factors.

Summary of the results is depicted in Table 17 Summary of the Results and Figure 18 Conceptual Model with Unstandardized Regression Coefficients below.

Hypothesis	Statement	Supported	P-Value
H1	Economic motivators drive consumers to choose sustainable options when building or renovating their homes.	Yes	0.001
H2	Regulatory motivators drive consumers to choose sustainable options when building or renovating their homes.	Yes	0.001
H3	Environmental concerns prompt consumers to adopt sustainable practices in home building and renovation.	Yes	0.001
H4	Social factors are significant in motivating consumers towards sustainable building and renovation options.	Yes	0.001
H5	Personal and psychological factors influence consumer preference for sustainability in building or renovating their homes.	Yes	0.001
H6	Cognitive-practical motivation facilitate consumer inclination towards sustainability when building or renovating their homes.	Yes	0.002

Table 17 Summary of the Results

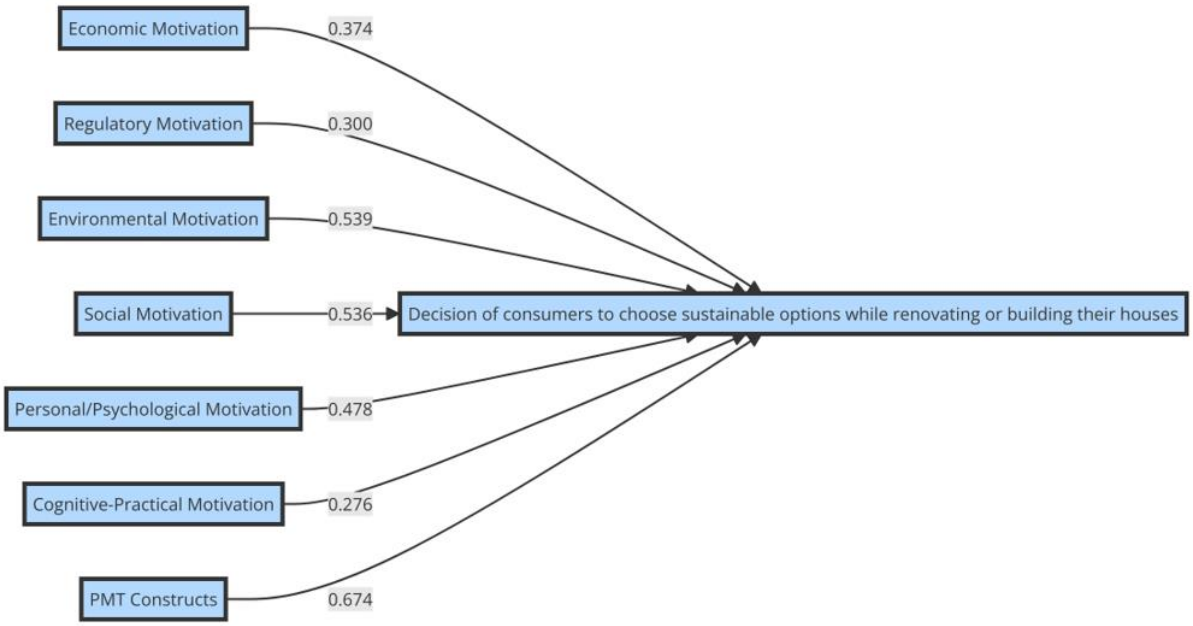

Figure 18 Conceptual Model with Unstandardized Regression Coefficients

8 Discussion

The results of our thesis revealed that 60% of females and 40% of males among the 50 respondents in Slovakia, who renovated or built their homes within the last decade, are motivated to choose sustainable options primarily due to the constructs of PMT Theory. In our thesis, these constructs include a person's belief in how serious the consequences of the threat will be, how vulnerable one feels about being impacted by an environmental crisis, and one's belief in the effectiveness of the protective behavior. In our case, when people believe that choosing sustainable options when building and renovating homes minimizes the threat of an environmental crisis, and when they believe that the consequences of an environmental crisis are threatening and feel vulnerable to this crisis, they are highly likely to choose these sustainable options. Our study proved that PMT constructs are the most influential motivator, with a p-value of <0.001. The regression coefficient suggests that for every unit increase in PMT Constructs, there is a corresponding 0.674 unit increase in the likelihood of choosing sustainable options. This finding was expected, as we chose Protection Motivation Theory (PMT) as our base theory, and many studies, such as those by Shafiei A. & Maleksaeidi H. (2020) and Janmaimool P. (2017), have also shown that these constructs are very influential when it comes to motivating protective behavior. Now, we will examine other motivators we anticipated would influence people's choice of sustainability.

The second most influential motivator for sustainable choices in the construction industry, according to our study, was the environmental concerns of our respondents. Our study indicates that when people are informed about the environmental situation and are aware of the environmental impact and their own impact on the environment, they tend to choose sustainable materials. This aligns with what Leslie et al. (2021) demonstrate in their study. They highlight that increased awareness of environmental issues and the potentially harmful effects on health and well-being can significantly motivate people to adopt more sustainable practices. Similarly, acknowledging the environmental impact is considered a potential motivator in the studies by Barreto et al. (2014) and Janmaimool (2017). We also agree with studies by Jowkar et al. (2022) and Arroyo & Carrete (2019), which suggest that an increase in environmental knowledge positively influences sustainable behavior, claiming that greater awareness leads to more eco-friendly actions. These aspects together reached a p-value of <0.001, and the regression coefficient was 0.539, suggesting strong motivation for choosing sustainable options when renovating or building homes. This supports our third hypothesis that environmental concerns prompt consumers to adopt sustainable practices in home building and renovation.

Our results showed that similar significant motivators of sustainable choices in Slovakia are social motivators such as social pressure, social engagement, and social responsibility. According to the results, when people observe that sustainable behavior is adopted in their surroundings, when they feel responsible for the well-being of their community, and when their family recommends sustainable options, they are more ready to adopt these sustainable practices as well. This was supported by a regression coefficient of 0.536 with a p-value of <0.001 in our study, which supported Hypothesis 4 that social factors are significant in motivating consumers toward sustainable building and renovation options. This is in contradiction to the study by Gręboszc-Krawczyk (2021), whose results showed that the impact of social value was not statistically significant ($p > 0.05$). We agree with Park & Kwon (2017) that individuals are motivated to act in ways that benefit society and set

positive examples. They claim that consumers may estimate the benefits based on the general and social mood of consumers' responsibility toward energy saving.

According to our results, personal/psychological factors are also strong motivators. One's beliefs, personal identity, anticipated emotions, and self-efficacy can significantly influence the sustainable choices of consumers. We agree with the studies that claim psychological/personal factors motivate sustainable behavior. One such study, by Mastria et al. (2023), highlights the significant influence of these expected emotional outcomes on individuals' willingness to adopt sustainable practices. These factors show a significant influence with a p-value of <0.001 and a regression coefficient of 0.478, which supports our fifth hypothesis that personal and psychological factors influence consumer preference for sustainability in building or renovating their homes.

We are also in line with the studies that claim economic, regulatory, and cognitive-practical factors motivate sustainable choices, although in our study they resulted in lower regression coefficients (<0.400), yet still significant with a p-value of <0.001 for economic and regulatory motivators and 0.002 for cognitive-practical factors. We agree with Meles and Ryan (2022) that economic motivation is not considered the most crucial factor influencing the decision to adopt the sustainable choices, as we found environmental, social, and personal/psychological factors to be more influential.

In conclusion, the results of our study conclusively support all our hypotheses, demonstrating that a variety of factors influence the decision to choose sustainable options in home building and renovation.

9 Conclusion

In dealing with the severe environmental crisis our planet faces today, including climate change, biodiversity loss, urban pollution, and water scarcity, it is increasingly clear that significant changes in both individual and collective environmental behaviors are necessary. This thesis explores the various motivations behind consumers' decisions to adopt sustainable practices during home renovation and building projects. We focus particularly on the building industry because it significantly contributes to these environmental issues. Changing human behavior and societal norms is extremely difficult. Therefore, by identifying the specific motivations that drive sustainable practices, this study aims to provide valuable insights that can help design effective interventions and policies within the building industry to promote sustainable options and thereby contribute to broader environmental sustainability goals (DuNann Winter & Koger, 2004; Gardner & Stern, 2002; Vlek & Steg, 2007; Ripple et al., 2017; Lange, 2023; Louzi et al., 2022; Häkkinen, 1994).

In the literature review for this thesis, we explored a range of articles to understand different theories about environmental behaviors, choosing the Protection Motivation Theory (PMT) as our theoretical base. This theory examines how people recognize threats and the actions they take to minimize these threats (Norman et al., 2015; Kothe et al. 2019). We also reviewed articles to identify what, besides the PMT Constructs, motivates consumers when they are renovating or building their homes. In the studies we examined, we found a wide range of motivators, such as economic benefits, social influences, personal values, and many others, all of which potentially impact environmental behaviors.

We carefully categorized various types of motivations that, according to different studies, influence consumers when they are renovating or building their homes. The main categories we included are Economic, Regulatory, Environmental, Social, Personal/Psychological, Cognitive-Practical motivations, and PMT Constructs. Each category contains specific motives, such as cost savings, environmental benefits, social expectations, personal beliefs, and convenience.

We examined these main motivation factors and tested our hypothesis through an online survey. The methodology involved distributing an online questionnaire to individuals who have engaged in home renovation or construction within the past ten years in Slovakia. Respondents expressed their agreement with statements related to economic, regulatory, environmental, social, psychological/personal, cognitive-practical motivators, and PMT constructs using a 5-point Likert scale. This approach allowed us to collect quantifiable data about the importance of each motivational factor in the decision-making process for home renovations and building projects.

The key findings of the empirical part of this thesis show that various factors influence consumer decisions for sustainable home building and renovation. Besides the already known PMT constructs, environmental concerns are the most powerful drivers. This is when the individuals are significantly motivated by their awareness of the environmental impacts. Social influences, such as community values and societal norms, also strongly shape decisions towards sustainability, highlighting the role of social context in encouraging eco-friendly building practices. Personal beliefs and emotions also significantly guide consumer choices. How individuals feel about sustainability can deeply influence their building or renovation decisions. While economic factors like cost savings and financial support are important, they do not motivate individuals as strongly as environmental or social factors.

Additionally, legal requirements and policies are crucial, as they motivate people to make sustainable choices, showing that government regulations are effective in promoting green building practices.

Practical considerations, such as the ease of implementing sustainable options and their direct benefits, are the least influential factors. Although these aspects are considered, they are not as motivating as the emotional, social, or legal motivations.

As expected, the elements from the Protection Motivation Theory (PMT), which include how people view threats and how effective they think their responses are, also play a significant role in shaping decisions. This theory helps explain why people choose to adopt sustainable practices by focusing on how serious they believe environmental threats are, how likely they feel they are to be affected, and how effective they think their actions can be in addressing these threats. Including PMT constructs in our research provided deeper insight into why people decide to build sustainably. It showed how consumers' understanding of environmental risks and their confidence in their own actions to reduce these risks affect their choices (Norman et al., 2015; Kothe et al. 2019). This insight confirms the findings of previous studies that tested PMT constructs, demonstrating how crucial these factors are in motivating people to engage in sustainable building practices. These studies illustrate that when people perceive higher environmental risks and believe that their actions can make a difference, they are more likely to adopt behaviors that lead to sustainability (Floyd, Prentice-Dunn, & Rogers, 2000; Bockarjova & Steg, 2014; Janmaimool, 2017; Shafiei A. & Maleksaeidi H., 2020).

Combining all these elements, the thesis provides a comprehensive view of the various factors that drive sustainable building and renovation choices. The findings suggest that motivating consumer's towards more sustainable choices should not only focus on the practical and economic aspects but also consider the emotional and societal dimensions that significantly impact consumer behavior in the context of sustainability. This comprehensive understanding can help in designing more effective interventions and policies promoting more sustainable building practices across different demographics.

10 Managerial Implications

The results of this thesis provide valuable insights for managers and decision-makers in the construction, real estate, and home renovation industries. Understanding why consumers choose sustainable building methods can help businesses stand out in the market.

According to our study, environmental concerns significantly influence consumer choices. Therefore, managers should actively promote the environmental benefits of their products and services, such as energy efficiency, the use of sustainable materials, and the potential for reducing environmental footprints. This information must be accurate to avoid losing consumer trust due to greenwashing. Guerreiro and Pacheco (2021) revealed that the perception of greenwashing affects green purchasers' customer brand engagement through green trust and fully mediates the relationship between greenwashing perception and green purchase intention. There is a mediation effect involving green trust, customer brand engagement, and green word-of-mouth (WOM). Thus, minimizing the perception of greenwashing alone might not be enough to boost sales. Companies need to employ effective word-of-mouth practices that highlight their green efforts' reliability in consumers' eyes to increase their level of purchase.

Regulatory motivations also play a crucial role in shaping consumer decisions. Managers should ensure regulatory compliance in their marketing and value propositions. By informing customers about how their products meet or exceed current regulations (for example, EU regulations), companies can build trust and encourage more sustainable choices, thereby increasing their profits (McComb, 2002).

Regular reporting on the sustainability impacts, both environmental and social, is important not only to meet regulatory requirements but also to build brand reputation and consumer trust, as stated by Glass (2012), who explored sustainability reporting in the construction sector.

Our results revealed that social factors are very important in driving sustainability choices in Slovakia. Therefore, companies should employ strategies that demonstrate social proof and community influence. Engaging in partnerships or ambassadorships with trusted community members, opinion leaders, or influencers who advocate for sustainable living can increase credibility and influence consumer behavior, as suggested by Valente and Pumpuang (2007) in their article, "Identifying opinion leaders to promote behavior change."

Collaboration with governments, NGOs, and other stakeholders can help meet legal and social needs. This suggestion is also discussed by Harangozó and Zilahy (2015) in their article on how cooperation between businesses and non-governmental organizations can help promote sustainable development. They provided empirical evidence of the importance of SME-NGO relationships. These partnerships can increase trust, provide access to more resources, and help reach a wider audience.

Since economic factors are strong motivators, emphasizing long-term cost savings and potential increases in property value can be very effective for companies. Providing clear, quantitative data on payback periods, savings on utility bills, and available government incentives can strongly support sustainable choices. This was proven in the study by Boogen et al. (2022), where their results suggest that the information treatment triggered purchase decisions associated with positive private financial returns.

Personal and psychological factors greatly influence consumer choices as well. Personalizing marketing messages to align with individual values, aspirations, and lifestyle choices can effectively encourage different consumer segments. The key findings of the study by Taufique (2022) suggest that consumers' emotional connection to nature and environmental values have a strong, direct positive influence on green consumer behavior.

Although cognitive-practical motivation has a smaller effect compared to other factors, it remains a significant influencer. Managers should ensure that the practical benefits, such as ease of use, convenience, and maintenance, are properly communicated. Offering education about the benefits and practicalities of sustainable building and renovation through workshops or online webinars can increase consumer knowledge and comfort with these choices. This suggestion was inspired by Moslehpour et al. (2018), who examined the effects of Perceived Usefulness and Perceived Ease of Use on E-Purchase Intention. We believe that this could also be useful in the building industry.

Lastly, according to Epstein and Roy (2001), the feedback process cannot rely exclusively on data relating to financial performance. Appropriate management control systems should gather feedback on potential environmental and social impacts, sustainability performance (at all organizational levels), sustainability initiatives, stakeholder reactions, and corporate financial performance. Setting up methods to regularly gather customer feedback can be useful for understanding how well a company's sustainability initiatives align with consumer motivations and expectations. This feedback can help refine strategies and offerings over time.

Our suggestions regarding the managerial implications of our study results can help companies meet the growing consumer demand for sustainable building and renovation solutions (Hayles & Kooloos, 2005) and potentially give them a competitive advantage in the market.

11 Limitations and Recommendations for Future Research

The sampling method used was convenience sampling, which, while efficient, lacks randomization and can lead to selection bias, making the results less generalizable to the broader population. Our sample was gathered from specific regions within Slovakia, particularly in and around the cities of Bratislava, Brezno, and Levoča, where we had established networks. Due to the reliance on our networks and the limited timeframe, the sample included 50 Slovak inhabitants. While this provided valuable insights, it may not fully represent the entire Slovak population that has renovated or built their houses in the last decade, especially those residing in the southern or northern regions, more remote areas, or other regions where we did not have established contacts. Future research could enhance the reliability and generalizability of the findings by increasing the sample size and/or conducting similar studies in other countries.

Convenience sampling can also introduce biases based on the time of day, location, and manner of participant selection. Moreover, as the study involves self-reported data, such as a questionnaire, there is always a risk of response bias, where participants might provide socially acceptable answers or responses they believe the researchers want to hear, rather than their true feelings or experiences (Nunan, Birks & Malhotra, 2020). To address these issues, future research could adopt approaches that help minimize these biases.

Some questions from our questionnaire were excluded in the factor analysis because they did not align with the factor we initially intended. For example, we excluded the entire section about the costs of buying and maintenance and convenience. In future research, better-formulated questions should be asked to fit these variables into intended factors and obtain more valuable results.

In our dataset, there was missing data for demographic questions, such as gender identity and age, because we did not require answers to these questions. Future research could force these responses to obtain a more accurate picture of demographic matters.

There may be more factors motivating people to choose sustainable options while renovating or building their houses than those we examined. Additionally, the study was conducted over a period of two weeks, making it cross-sectional, with data collected at one point in time, and unable to track changes over time (Nunan, Birks & Malhotra, 2020). Future research can focus on exploring other factors that influence consumers when building or renovating their homes and track whether these motives remain consistent over time or change.

For a deeper understanding of our topic, future research could incorporate qualitative analysis, such as interviews, to gain deeper insights into the population’s psychological drivers. This qualitative data can also be used to verify the results of our study, determine if the factors that were not significant truly are insignificant, or identify other motives to consider.

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Appendices

Appendix 1: Survey Translated to English

Default Question Block

Dear survey participant,
Allow me to introduce myself as a student at the University of Hasselt in Belgium. I am currently working on my thesis, which aims to explore the factors motivating consumers when deciding on different material alternatives in the process of building or renovating their homes. Your responses in this questionnaire will provide invaluable insight into this issue and significantly contribute to the successful completion of my work.
Thank you sincerely for your time and willingness to contribute to this research!
This questionnaire will take approximately 5 to 10 minutes.

Data Protection (GDPR Statement):
By clicking "I Agree," you confirm that you consent to the use of your responses, which will be used in aggregated and anonymized form for research purposes at the University of Hasselt. You may leave the questionnaire at any time if you wish.

I agree
I disagree

Thank you for your support and cooperation.

Building Question

Have you renovated or built your home in the last 10 years?

Yes
No

Section 1 – Economic and Regulatory Motivation

Please indicate your level of agreement with the following statements:

I strongly disagree
I disagree
I am neutral
I agree
I strongly agree

Costs of Buying and Maintenance *(this section was excluded after the factor analysis)*

1. The company offers building materials. Some are more sustainable than others. I would buy sustainable materials even if they were more expensive.
2. Price is important to me when choosing materials for building or renovating my home.
3. I am willing to pay more for materials that are more sustainable.
4. Taking steps to reduce environmental problems costs too much money.

Financial Incentives

1. I would choose sustainable materials if I received a subsidy for them.
2. I would buy sustainable materials if the government provided more financial assistance for them.

Energy Savings

1. I would choose sustainable materials if I knew they would save me energy costs.

Regulations

1. Governments should force industry and businesses to protect the environment.
2. I would choose sustainable materials because the government requires it.
3. It is difficult for me to comply with environmental protection regulations. *(Excluded based on the factor analysis)*
4. I would choose sustainable materials to meet the EU's sustainability goals or those of another organization.

Section 2 – Environmental Motivation

Environmental Impact

1. I would choose sustainable materials if I knew they would help with the climate crisis.
2. I would participate in environmental protection programs such as tree planting, waste separation, and recycling. *(Excluded based on the factor analysis)*
3. I try to save energy. *(Excluded based on the factor analysis)*
4. I would choose sustainable materials because I want to have a positive impact on the environment.

Environmental Awareness

1. I am not very concerned about the environment. *(Excluded based on the factor analysis)*
2. The environment is a high priority for me compared to many other things.
3. There is no real environmental crisis. *(Excluded based on the factor analysis)*
4. I would choose sustainable materials because they are good for the environment.

Section 3 – Social Motivation

Social Pressure

1. I would choose sustainable options if my family and friends did the same.
2. I would choose sustainable options if someone told me they are better.
3. I would choose sustainable materials because I want others to do the same.
4. I would choose sustainable materials because I want to show off to others.
5. I would choose sustainable materials because I want to be a positive example for others.
6. My possible participation in environmental programs will definitely have a positive impact on the interest of others to participate.

Social Engagement

1. I contribute to increasing environmental awareness in my surroundings.
2. I would choose sustainable materials because my city is working to become greener, and I want to help with that.
3. I would choose sustainable materials because they are better for my surroundings and neighbors.
4. I would choose sustainable materials because they do not harm my surroundings or neighbors.

Section 4 – Personal/Psychological Motivation

Beliefs

1. I would choose sustainable materials because I have read that they are better.
2. I would choose sustainable materials because I believe they are better than less sustainable ones.

Anticipated Emotions

1. I would choose sustainable materials because I lead a sustainable lifestyle.
2. I would choose sustainable materials because I want to be eco-friendly.
3. I would choose sustainable materials because I then feel better.
4. I would feel guilty if I did not choose an eco-friendly option.

Self-Efficacy

1. I know how to take steps to protect the environment in everyday life.
2. I can solve environmental problems if I try.
3. Whatever happens in relation to the environment, I will be able to handle it.
4. I am not afraid of the difficulties that may arise due to global environmental problems because I trust my ability to cope with them.

Section 5 – Cognitive-Practical Motivation and PMT Constructs

Knowledge

1. I would choose sustainable materials because I am fully informed about environmental issues. (MOVED TO THE ENVIRONMENTAL MOTIVATION)
2. I would choose sustainable materials because I am aware that we need to transition to more sustainable and environmentally friendly options. (MOVED TO THE ENVIRONMENTAL MOTIVATION)
3. I know some sustainable materials.
4. I have never heard of sustainable materials.
5. I have never heard anything about energy savings from sustainable building materials.

Severity (PMT CONSTRUCT)

1. Environmental pollution has become a serious threat to humanity.
2. The negative impacts of natural resource depletion are serious.
3. The idea of climate change scares me.

Vulnerability (PMT CONSTRUCT)

1. Environmental pollution can have a negative impact on me.
2. I will experience the negative effects of environmental degradation during my lifetime.
3. I am vulnerable to the negative effects of climate change.

Technical Interest

1. I would choose innovative building materials because I am interested in innovations. *(Excluded based on the factor analysis)*
2. I would choose technological building materials because I am interested in new technologies. *(Excluded based on the factor analysis)*
3. I have never heard of the technological advantages of sustainable building materials.

Convenience

1. I would choose materials that are more comfortable and easier to use. *(Excluded based on the factor analysis)*
2. I spend time on personal activities more than pro-environmental activities. *(Excluded based on the factor analysis)*

Response-Efficacy (PMT CONSTRUCT)

1. Having environmental ethics contributes to reducing environmental risks.
2. If I increase my attention to the environment, I can reduce the likelihood of environmental degradation.

3. An individual's actions can contribute to improving the quality of the environment.

Demographics

How old are you?
(Open question)

What is your gender identity?

Male
Female
Other

Appendix 2: Survey Distributed (in Slovak)

UHASSELT

Default Question Block

Vážený účastník dotazníka,
dovoľte mi predstaviť sa ako študentka Univerzity v Hasselte, v Belgicku. Momentálne pracujem na mojej diplomovej práci, ktorej cieľom je preskúmať faktory motivujúce spotrebiteľov pri rozhodovaní sa pre rôzne alternatívy materiálov v procese stavby či renovácie ich domovov. Vaše odpovede v tomto dotazníku poskytnú neoceniteľný pohľad do tejto problematiky a významne prispejú k úspešnému dokončeniu mojej práce.
Srdečne Vám ďakujem za Váš čas a ochotu prispieť k tomuto výskumu!
Tento dotazník Vám zaberie približne 5 až 10 minút.

Ochrana osobných údajov (GDPR vyhlásenie):
Týmto dobrovoľne vyjadrujem súhlas so spracovaním mojich osobných údajov v rámci uvedeného výskumu. Kliknutím na „Súhlasím" potvrdzujete, že súhlasíte s použitím vašich odpovedí, ktoré budú v agregovanej a anonymizovanej forme využité pre výskumné účely na Univerzite v Hasselte. Máte možnosť kedykoľvek dotazník opustiť, ak si to budete priať.

Ďakujem Vám za podporu a spoluprácu.

- ○ Súhlasím
- ○ Nesúhlasím

Building question

Rekonštruovali ste alebo postavili svoj domov za posledných 10 rokov?

- ○ Áno
- ○ Nie

Section 1 – Economic and Regulatory Motivation

Prosím, uveďte mieru Vášho súhlasu s nasledujúcimi tvrdeniami.

	Rozhodne nesúhlasím	Nesúhlasím	Nezaujímam postoj	Súhlasím	Rozhodne súhlasím
Spoločnosť ponúka stavebné materiály. Niektoré z nich sú udržateľnejšie, zatiaľ čo iné menej. Kúpil/a by som udržateľnejšie materiály, aj keby boli drahšie.	○	○	○	○	○
Cena je pre mňa dôležitá pri výbere materiálov na stavbu alebo renováciu môjho domova.	○	○	○	○	○
Som ochotný/á zaplatiť viac za materiály, ktoré sú udržateľnejšie.	○	○	○	○	○
Podniknutie krokov na zníženie environmentálnych problémov stojí príliš veľa peňazí.	○	○	○	○	○

Prosím, uveďte mieru Vášho súhlasu s nasledujúcimi tvrdeniami.

	Rozhodne nesúhlasím	Nesúhlasím	Nezaujímam postoj	Súhlasím	Rozhodne súhlasím
Vybral/a by som si udržateľnejšie materiály, ak by som na ne dostal/a dotáciu.	○	○	○	○	○
Kúpil/a by som udržateľnejšie materiály, ak by na ne vláda poskytovala väčšiu finančnú pomoc.	○	○	○	○	○

Prosím, uveďte mieru Vášho súhlasu s nasledujúcim tvrdením.

	Rozhodne nesúhlasím	Nesúhlasím	Nezaujímam postoj	Súhlasím	Rozhodne súhlasím
Vybral/a by som si udržateľné materiály, keby viem, že mi ušetria náklady na energiu.	○	○	○	○	○

Prosím, uveďte mieru Vášho súhlasu s nasledujúcimi tvrdeniami.

	Rozhodne nesúhlasím	Nesúhlasím	Nezaujímam postoj	Súhlasím	Rozhodne súhlasím
Vlády musia nútiť priemysel a podniky chrániť životné prostredie.	○	○	○	○	○
Vybral/a by som si udržateľné materiály, pretože to vyžaduje vláda.	○	○	○	○	○
Je pre mňa ťažké dodržiavať nariadenia ochrany životného prostredia.	○	○	○	○	○
Vybral/a by som si udržateľné materiály, pretože chcem splniť udržateľné ciele EÚ alebo inej organizácie.	○	○	○	○	○

Section 2 – Environmental Motivation

Prosím, uveďte mieru Vášho súhlasu s nasledujúcimi tvrdeniami.

	Rozhodne nesúhlasím	Nesúhlasím	Nezaujímam postoj	Súhlasím	Rozhodne súhlasím
Vybral/a by som si udržateľné materiály, keby som vedel/a, že pomôžu s klimatickou krízou.	○	○	○	○	○

	Rozhodne nesúhlasím	Nesúhlasím	Nezaujímam postoj	Súhlasím	Rozhodne súhlasím
Zúčastnil/a by som na programoch ochrany životného prostredia, ako je výsadba stromov, separácia odpadu a recyklácia.	○	○	○	○	○
Snažím sa šetriť energiu.	○	○	○	○	○
Vybral/a by som si udržateľné materiály, pretože chcem mať pozitívny vplyv na životné prostredie.	○	○	○	○	○

Prosím, uveďte mieru Vášho súhlasu s nasledujúcimi tvrdeniami.

	Rozhodne nesúhlasím	Nesúhlasím	Nezaujímam postoj	Súhlasím	Rozhodne súhlasím
O životné prostredie sa príliš nestarám.	○	○	○	○	○
Životné prostredie má pre mňa vysokú prioritu v porovnaní s mnohými inými vecami.	○	○	○	○	○
Neexistuje žiadna skutočná environmentálna kríza.	○	○	○	○	○

	Rozhodne nesúhlasím	Nesúhlasím	Nezaujímam postoj	Súhlasím	Rozhodne súhlasím
Vybral/a by som si udržateľné materiály, pretože sú dobré pre životné prostredie.	○	○	○	○	○

Section 3 – Social Motivation

Prosím, uveďte mieru Vášho súhlasu s nasledujúcimi tvrdeniami.

	Rozhodne nesúhlasím	Nesúhlasím	Nezaujímam postoj	Súhlasím	Rozhodne súhlasím
Vybral/a by som si udržateľné možnosti, keby tak robí aj moja rodina a priatelia.	○	○	○	○	○
Vybral/a by som si udržateľné možnosti, keby mi niekto povedal, že sú lepšie.	○	○	○	○	○
Vybral/a by som si udržateľné materiály, pretože chcem, aby to robili aj ostatní.	○	○	○	○	○
Vybral/a by som si udržateľné materiály, pretože sa chcem ukázať ostatným.	○	○	○	○	○

	Rozhodne nesúhlasím	Nesúhlasím	Nezaujímam postoj	Súhlasím	Rozhodne súhlasím
Vybral/a by som si udržateľné materiály, pretože chcem byť pozitívnym príkladom pre ostatných.	○	○	○	○	○
Moja prípadná účasť na environmentálnych programoch bude mať určite pozitívny vplyv na záujem o účasť iných.	○	○	○	○	○

Prosím, uveďte mieru Vášho súhlasu s nasledujúcimi tvrdeniami.

	Rozhodne nesúhlasím	Nesúhlasím	Nezaujímam postoj	Súhlasím	Rozhodne súhlasím
Podieľam sa na zvyšovaní environmentálneho povedomia v mojom okolí.	○	○	○	○	○
Vybral/a by som si udržateľné materiály, pretože moje mesto pracuje na tom, aby bolo zelenšie a aj ja s tým chcem pomôcť.	○	○	○	○	○

	Rozhodne nesúhlasím	Nesúhlasím	Nezaujímam postoj	Súhlasím	Rozhodne súhlasím
Vybral/a by som si udržateľné materiály, pretože sú lepšie pre moje okolie a susedov.	○	○	○	○	○
Vybral/a by som si udržateľné materiály, pretože neškodia môjmu okoliu ani susedom.	○	○	○	○	○

Section 4 – Personal/ Psychological Motivation

Prosím, uveďte mieru Vášho súhlasu s nasledujúcimi tvrdeniami.

	Rozhodne nesúhlasím	Nesúhlasím	Nezaujímam postoj	Súhlasím	Rozhodne súhlasím
Vybral/a by som si udržateľné materiály, pretože som čítal, že sú lepšie.	○	○	○	○	○
Vybral/a by som si udržateľné materiály, pretože verím, že sú lepšie ako menej udržateľné.	○	○	○	○	○

Prosím, uveďte mieru Vášho súhlasu s nasledujúcimi tvrdeniami.

	Rozhodne nesúhlasím	Nesúhlasím	Nezaujímam postoj	Súhlasím	Rozhodne súhlasím
Vybral/a by som si udržateľné materiály, pretože vediem udržateľný životný štýl.	○	○	○	○	○
Vybral/a by som si udržateľné materiály, pretože chcem byť ekologický/á.	○	○	○	○	○
Vybral/a by som si udržateľné materiály, pretože sa potom cítim lepšie.	○	○	○	○	○
Cítil/a by som sa vinný/á, keby som si nevybral/a ekologickú možnosť.	○	○	○	○	○

Prosím, uveďte mieru Vášho súhlasu s nasledujúcimi tvrdeniami.

	Rozhodne nesúhlasím	Nesúhlasím	Nezaujímam postoj	Súhlasím	Rozhodne súhlasím
Viem, ako prijať opatrenia na ochranu životného prostredia v každodennom živote.	○	○	○	○	○
Dokážem riešiť environmentálne problémy, ak sa budem snažiť.	○	○	○	○	○
Nech sa deje čokoľvek v súvislosti so životným prostredím, budem to vedieť zvládnuť.	○	○	○	○	○
Neobávam sa ťažkostí, ktoré môžu vzniknúť v dôsledku globálnych environmentálnych problémov, pretože dôverujem svojej schopnosti vyrovnať sa s nimi.	○	○	○	○	○

Section 5 – Cognitive-Practical Motivation

Prosím, uveďte mieru Vášho súhlasu s nasledujúcimi tvrdeniami.

	Rozhodne nesúhlasím	Nesúhlasím	Nezaujímam postoj	Súhlasím	Rozhodne súhlasím
Vybral/a by som si udržateľné materiály, pretože som plne informovaný/á o environmentálnych otázkach.	○	○	○	○	○
Vybral/a by som si udržateľné materiály, pretože som si vedomý/á, že potrebujeme prejsť na udržateľnejšie a ekologicky prijateľnejšie možnosti.	○	○	○	○	○
Poznám nejaké udržateľné materiály.	○	○	○	○	○
Nikdy som nepočul/a o udržateľných materiáloch.	○	○	○	○	○
Nikdy som nepočul/a nič o energetických úsporách z udržateľných stavebných materiálov.	○	○	○	○	○

Prosím, uveďte mieru Vášho súhlasu s nasledujúcimi tvrdeniami.

	Rozhodne nesúhlasím	Nesúhlasím	Nezaujímam postoj	Súhlasím	Rozhodne súhlasím
Environmentálne znečistenie sa stalo vážnou hrozbou pre ľudstvo.	○	○	○	○	○
Negatívne dopady vyčerpania prírodných zdrojov sú vážne.	○	○	○	○	○
Myšlienka klimatickej zmeny ma desí.	○	○	○	○	○

Prosím, uveďte mieru Vášho súhlasu s nasledujúcimi tvrdeniami.

	Rozhodne nesúhlasím	Nesúhlasím	Nezaujímam postoj	Súhlasím	Rozhodne súhlasím
Environmentálne znečistenie na mňa môže mať negatívny vplyv.	○	○	○	○	○
Zažijem negatívne účinky environmentálnej degradácie počas môjho života.	○	○	○	○	○
Som zraniteľný/á voči negatívnym účinkom klimatickej zmeny.	○	○	○	○	○

Prosím, uveďte mieru Vášho súhlasu s nasledujúcimi tvrdeniami.

	Rozhodne nesúhlasím	Nesúhlasím	Nezaujímam postoj	Súhlasím	Rozhodne súhlasím
Vybral/a by som si inovatívne stavebné materiály, pretože mám záujem o inovácie.	○	○	○	○	○
Vybral/a by som si technologické stavebné materiály, pretože mám záujem o nové technológie.	○	○	○	○	○
Nikdy som nepočul/a o technologických výhodách udržateľných stavebných materiálov.	○	○	○	○	○

Prosím, uveďte mieru Vášho súhlasu s nasledujúcimi tvrdeniami.

	Rozhodne nesúhlasím	Nesúhlasím	Nezaujímam postoj	Súhlasím	Rozhodne súhlasím
Vybral/a by som si materiály, ktoré sú pohodlnejšie a jednoduchšie na používanie.	○	○	○	○	○

	Rozhodne nesúhlasím	Nesúhlasím	Nezaujímam postoj	Súhlasím	Rozhodne súhlasím
Venujem čas osobným aktivitám viac ako pro-environmentálnym aktivitám.	○	○	○	○	○

Prosím, uveďte mieru Vášho súhlasu s nasledujúcimi tvrdeniami.

	Rozhodne nesúhlasím	Nesúhlasím	Nezaujímam postoj	Súhlasím	Rozhodne súhlasím
Mať environmentálnu etiku prispieva k zníženiu environmentálnych rizík.	○	○	○	○	○
Ak zvýšim svoju pozornosť voči životnému prostrediu, môžem znížiť pravdepodobnosť environmentálnej degradácie.	○	○	○	○	○
Konanie jednotlivca môže prispieť k zlepšeniu kvality životného prostredia.	○	○	○	○	○

Demographics

Koľko máte rokov?

Aká je Vaša rodová identita?

- ○ Muž
- ○ Žena
- ○ Iné