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Navigating Barriers and Opportunities of Green Entrepreneurship in the Construction Sector

EXPEDITO XAVIER GURGURI NETO

Département de mathématiques et de génie industriel

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Ce mémoire intitulé :

Navigating Barriers and Opportunities of Green Entrepreneurship in Construction Sector

présenté par **Expedito Xavier GURGURI NETO**

en vue de l'obtention du diplôme de *Maîtrise ès sciences appliquées*

a été dûment accepté par le jury d'examen constitué de :

Fabiano ARMELLINI, président
Mario BOURGAULT, membre et directeur de recherche
Yabo Octave NIAMIÉ, membre et codirecteur de recherche
Michel DE BLOIS, membre

DEDICATION

To my dad, who believed in me, and I lost during this journey.

To my mom, the pillar of my principles and my best friend.

To my brothers, who shaped me and strengthened me.

To my friends, who supported me when I couldn't.

To me, for (almost) never giving up.

To God, for everything.

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This endeavor would not have been possible without the collaboration of the entrepreneurs who believed in this research and made themselves available through their busy calendars.

To my family, thank you for your endless patience, understanding, and unwavering encouragement, which were crucial to my success.

I'd also like to thank my friends for their moral support and for making the journey more enjoyable.

RÉSUMÉ

L'impact environnemental significatif de l'industrie de la construction, qui représente 36 % de la consommation mondiale d'énergie et un tiers des émissions de gaz à effet de serre, nécessite un changement fondamental de ses pratiques pour atteindre les objectifs climatiques internationaux. Malgré la disponibilité de technologies durables, leur adoption est entravée par des barrières systémiques au sein de l'industrie. Cette étude qualitative explore comment les entrepreneurs verts du secteur de la construction durable identifient les opportunités, gèrent les relations avec les parties prenantes, naviguent dans les environnements réglementaires et adaptent leurs modèles économiques pour stimuler le changement.

Cette recherche est basée sur des entretiens semi-structurés avec 13 entrepreneurs de divers segments de l'industrie de la construction durable. Les données, collectées auprès de ces praticiens, ont été systématiquement analysées par un processus de codage à trois niveaux. Cette méthode a permis d'identifier des thèmes émergents et des perspectives théoriques globales à partir des expériences des entrepreneurs, en passant de leurs mots à des dimensions conceptuelles plus larges.

Les résultats de l'étude révèlent trois thèmes centraux qui définissent l'entrepreneuriat vert dans la construction. Premièrement, le « parcours de l'entrepreneur vert » est initié par la reconnaissance des défaillances du marché qui correspondent aux valeurs pro-environnementales, avec des chemins distincts pour les entrepreneurs de services et de produits. Deuxièmement, « l'impact des parties prenantes sur l'adoption de la construction écologique » souligne le fardeau éducatif important qui pèse sur les entrepreneurs, qui doivent traduire les valeurs environnementales en avantages économiques pour persuader les clients et les investisseurs de l'industrie. Troisièmement, la « dynamique du marché et de l'innovation » expose les défis du greenwashing et d'un « catch-22 réglementaire », où les codes de construction restrictifs étouffent l'innovation.

Cette recherche apporte des contributions théoriques introduisant des concepts clés tels que le « défi de la traduction des valeurs » et le « regulatory catch-22 » au discours académique. Révélant le rôle crucial du réseautage informel, montrant comment l'absence de régulation basée sur la performance constitue un obstacle majeur à l'innovation. En fin de compte, franchir ces obstacles constitue une étape cruciale vers une industrie de la construction plus durable et économiquement solide, qui devrait atteindre un marché mondial de 1,5 billion de dollars d'ici 2034.

ABSTRACT

The construction industry's significant environmental impact, accounting for 36% of global energy consumption and a third of greenhouse gas emissions, necessitates a fundamental shift in its practices to meet international climate targets. Despite the availability of sustainable technologies, their adoption is hindered by systemic barriers within the industry. This qualitative study explores how green entrepreneurs in the sustainable construction sector identify opportunities, manage stakeholder relationships, navigate regulatory environments, and adapt their business models to drive change.

This research is based on semi-structured interviews with 13 entrepreneurs from various segments of the sustainable construction industry. The data, collected from these practitioners, was systematically analyzed through a three-tiered coding process. This method allowed for the identification of emergent themes and overarching theoretical insights from the entrepreneurs' experiences, moving from their own words to broader conceptual dimensions.

The study's findings reveal three central themes that define green entrepreneurship in construction. First, the "green entrepreneurial journey" is initiated by recognizing market failures that align with pro-environmental values, with distinct paths for service-based and product-based entrepreneurs. Second, the "impact of stakeholders on green building adoption" highlights the significant educational burden on entrepreneurs, who must translate environmental values into economic benefits to persuade clients and industry investors. Third, "market and innovation dynamics" exposes the challenges of greenwashing and a "regulatory catch-22," where restrictive building codes stifle innovation.

This research provides theoretical contributions introducing key concepts such as the "values translation challenge" and the "regulatory catch-22" to the academic discourse. Revealing the critical role of informal networking, showing how the absence of performance-based regulation is a primary barrier to innovation. Ultimately, navigating these barriers presents a critical step towards a more sustainable and economically robust construction industry, projected to be a $1.5 trillion global market by 2034.

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LIST OF SYMBOLS AND ABBREVIATIONS

B2B	Business to Business
B2B	Business to Consumer
CEO	Chief Executive Officer
CHQ	Canadian Heritage in Quebec
EE	Eco-Entrepreneurship
ESG	Environmental, Social, and Governance
GE	Green Entrepreneurship
GBCI	Green Building Certification Institute
IPCC	Intergovernmental Panel on Climate Change
LEED	Leadership in Energy and Environmental Design
MLP	Multi-Level Perspective
ROI	Return of Investment
R&D	Research and Development
SBMI	Sustainable Business Model Innovation
SDGs	Sustainable Development Goals
SDTC	Sustainable Development Technology Canada
SE	Sustainable Entrepreneurship
TBL	Triple Bottom Line
UK	United Kingdom
UNEP	United Nations Environment Programme
WEF	World Economic Forum
WLCA	Whole Life Carbon Assessment
WoS	Web of Science

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CHAPTER 1 INTRODUCTION

The construction industry stands at a critical juncture in the global effort to address climate change. Accounting for approximately 36% of global energy consumption and nearly one-third of greenhouse gas emissions (Precedence Research, 2025), the built environment represents both a significant environmental challenge (Huang et al., 2018) and an enormous opportunity for sustainable transformation (World Economic Forum, 2024). Despite the availability of proven green building technologies and growing environmental awareness among consumers and policymakers (Buerke et al., 2017), the widespread adoption of sustainable construction practices remains extremely complex (Gibbs & O'Neill, 2014). Systemic barriers embedded in industry culture, regulatory frameworks, and market structures continue to constrain the diffusion of sustainable innovation (Häkkinen & Belloni, 2011).

Within this challenging landscape, green entrepreneurs, defined as individuals who establish ventures with environmental sustainability as a core mission (Gerlach, 2003), emerge as critical agents of change (Shepherd & Patzelt, 2011). These entrepreneurs do not simply respond to market demand; they actively work to educate skeptical stakeholders, challenge entrenched industry norms, and demonstrate the viability of alternative construction practices (Gibbs, 2006). Unlike entrepreneurs in other industries, they must navigate an industry characterized by fragmented supply chains, risk-averse clients, restrictive building codes, and deeply ingrained conventional practices (Darko & Chan, 2017; Häkkinen & Belloni, 2011). How these entrepreneurs identify opportunities, build viable business models, engage with stakeholders, and respond to regulatory environments remains insufficiently understood in entrepreneurship literature.

This research addresses this gap by investigating green entrepreneurship within the sustainable construction sector. Through a qualitative approach, this study comprehend semi-structured interviews with 13 entrepreneurs operating across diverse segments of construction (including building materials manufacturing, green building consulting, architecture, project management, solar energy, and water management) exploring how green entrepreneurs recognize and exploit opportunities, navigate stakeholder relationships, respond to market and innovation dynamics, and adapt their business models to survive and thrive in a market that is simultaneously receptive to and resistant to sustainability innovation.

1.1 Research Problem and Objectives

While entrepreneurship literature has significantly examined opportunity recognition (Li et al., 2020), business model towards innovation (Kuratko, 2009), and entrepreneurial identity (Karabulut, 2016; Kerr et al., 2018), the specific context of sustainable entrepreneurship adds complexities that generic entrepreneurship frameworks do not fully address, as they are primarily economically focused (Johnson & Schaltegger, 2020). Consistent with sustainable entrepreneurship theory, green entrepreneurs operate at the intersection of environmental values and economic imperatives, requiring them to balance mission commitment with market realities (Schaltegger & Wagner, 2011). In the building industry, sustainable entrepreneurs encounter stakeholders who may be unfamiliar with or resistant to green practices, while also navigating regulatory and institutional frameworks primarily designed around conventional construction models (Darko & Chan, 2017).

Existing research on green entrepreneurship has predominantly adopted a macro-level perspective, focusing on systemic and structural dimensions such as policy frameworks, market conditions, and sustainability transitions (Gast et al., 2017; Johnson & Schaltegger, 2020; Schaltegger & Wagner, 2011; Terán-Yépez et al., 2020). Within the construction sector, this emphasis is reflected in studies examining industry-wide environmental impacts (Huang et al., 2018), regulatory and policy influences (UNEP, 2022), and structural barriers to the adoption of green building practices (Darko & Chan, 2017; Häkkinen & Belloni, 2011).

While these contributions provide important insights into the broader conditions shaping sustainable entrepreneurship, they offer a limited understanding of the micro-level processes through which individual entrepreneurs interpret, enact, and navigate sustainability in practice. In particular, less attention has been paid to the lived experiences, strategic decision-making, and day-to-day challenges faced by green entrepreneurs operating in the construction sector. This study addresses these gaps by investigating how entrepreneurs recognize and exploit sustainability-driven opportunities, respond to environmental and market constraints, and navigate the practical challenges of implementing sustainable practices within the green building sector. Therefore, it seeks to understand how green entrepreneurs navigate the opportunities and structural challenges associated with implementing sustainable practices in the construction sector.

This overarching objective is pursued through three specific objectives:

- To explore how green entrepreneurs identify, evaluate, and exploit opportunities for venture creation within the sustainable construction sector.
- To examine how key external actors (including clients, industry support programs, and professionals) shape the adoption and development of sustainable practices within the construction sector.
- To analyze how market dynamics, institutional constraints, and innovation processes influence the development of SMEs operating within the green building sector.

1.2 Methodology Overview

This study employs a qualitative research design based on semi-structured interviews with 13 green entrepreneurs operating in the sustainable construction sector. Participants were recruited using purposive sampling, a non-probability sampling technique in which participants are intentionally selected based on their relevance to the research objectives (Saunders et al., 2023). In this study, selection was guided by predefined criteria, as well as practical considerations such as accessibility and willingness to participate. The final sample reflects diversity across several relevant dimensions, including business models (product-based and service-based), client segments (Business-to-Consumer and Business-to-Business), geographic locations (primarily Quebec, Ontario, and British Columbia), and stages of venture maturity (ranging from recently established startups to firms with over 40 years of operation). This variation enhances the breadth of perspectives captured, although the findings are not intended to be statistically generalizable.

Data were analyzed following the systematic three-stage coding procedure proposed by Gioia et al. (2012). The analysis began with first-order coding, in which interview transcripts were examined line-by-line and coded using participants' own terms and expressions wherever possible. This stage generated a large set of descriptive codes that closely reflected how entrepreneurs articulated their experiences, challenges, and decision-making processes.

In the second stage, these first-order codes were compared and grouped into more abstract second-order themes. At this point, the analysis shifted from informant-centric terms to researcher-centric interpretation, identifying conceptual similarities, recurring patterns, and relationships across

interviews (Gioia et al., 2012). Constant comparison was used to refine themes and ensure internal consistency.

Finally, second-order themes were condensed into a smaller number of aggregate dimensions representing higher-level theoretical constructs. These dimensions capture the overarching mechanisms shaping green entrepreneurship in the sustainable construction sector and form the basis of the study's theoretical contribution. To enhance rigor, coding was iterative and recursive, with repeated returns to the raw transcripts to verify interpretations and ensure that higher-level abstractions remained grounded in the data.

1.3 Thesis Structure

This thesis is organized into seven chapters. Following this introduction, Chapter 2 presents a comprehensive literature review that examines the theoretical foundations of entrepreneurship, the emergence of green entrepreneurship as a distinct field of study, the specific context of sustainable construction, and the identification of research gaps that this study addresses. Chapter 3 details the methodology, including the research design, participant selection, data collection procedures, and analytical approach. Chapter 4 presents the results, organized around three major themes: the green entrepreneurial journey, the impact of stakeholders on green building adoption, and market and innovation dynamics. Chapter 5 provides a discussion of the findings, connecting them to existing literature, exploring practical implications, presenting the limitations of the study, and suggests directions for future research. Chapter 6 presents a conclusion that synthesizes the study's contributions.

1.4 Declaration of AI-assisted technologies in the writing process

In the preparation of this thesis, I have employed AI-assisted tools to enhance certain aspects of the writing process. Specifically, I used Grammarly for sentence rephrasing, Apple Intelligence for synonym suggestions and clarity improvements, and Manus AI for verifying specific DOI references and relevant academic literature. All analyses, interpretations, and conclusions presented in this thesis are the result of my own work.

CHAPTER 2 LITERATURE REVIEW

The literature review process combined a systematic search strategy with an interpretive selection approach. The review focused on key themes, including the drivers of green business formation, the role of innovation in environmental sustainability, the challenges faced by eco-innovators, governmental incentives and barriers, and the policy frameworks supporting green ventures. Insights derived from this review informed the development of the research questions and the interview protocol, ensuring alignment with relevant gaps in the literature.

The review is based on a systematic search strategy conducted in the Web of Science (WoS) database, guided by defined temporal boundaries and inclusion and exclusion criteria, which resulted in an initial corpus of 526 publications. While the identification of literature followed a structured and reproducible process, the subsequent analysis adopted an iterative and interpretive approach. The selection process was guided by a critical assessment of each study's conceptual relevance, alignment with the analytical focus of the research, and significance within the broader academic discourse.

The final selection of 66 references was determined through an interpretive evaluation of their theoretical relevance, empirical contribution, and alignment with the study's focus. In addition to the initial database results, supplementary sources were identified through backward snowballing, whereby references cited within key articles were reviewed and included when they provided significant conceptual or empirical insights. Accordingly, this review does not aim to provide an exhaustive or fully reproducible account of all available literature. Rather, it synthesizes the most pertinent contributions to develop a coherent understanding of the field and to support the analytical framework advanced in this thesis.

The systematic search strategy was conducted in the academic database WoS, using a structured conceptual framework that combined three primary thematic areas: entrepreneurship, sustainability, and building/construction, as shown in Table 2.1. Boolean operators (AND, OR) were used to create systematic search strings that captured the intersection of these domains while maintaining sufficient specificity to ensure relevance.

Table 2.1 Conceptual framework & Boolean Operators

Concepts	Topic Keywords
Entrepreneurship	entrepreneur*, intrapreneur*, ecopreneur*
Sustainability	environment*, sustainab*, efficien*, ecoresponsab*, build*, green*, develop*, ecolog*, "low-impact", "energy-efficient", "eco-innovation"
Building	construct*, structure*, edific*, build*, LEED
Boolean Operators	
(entrepreneur* OR intrapreneur* OR ecopreneur*) AND	
(environment* OR sustainab* OR efficien* OR ecoresponsab* OR green* OR develop* OR ecolog* OR "low-impact" OR "energy-efficient" OR "eco-innovation") AND	
(construct* OR structure* OR edific* OR build* OR LEED*)	

The temporal strategy was inspired by the research of Contreras & Dornberger (2023), which analyzed the evolving field of knowledge in sustainable entrepreneurship in the global south. As demonstrated in

Figure 2.1 Number of articles on sustainable entrepreneurship in the last 20 years

below, an up-to-date analysis of the number of articles on sustainable entrepreneurship in the scientific research tool WoS reveals a growing number of research papers to study and understand this phenomenon.

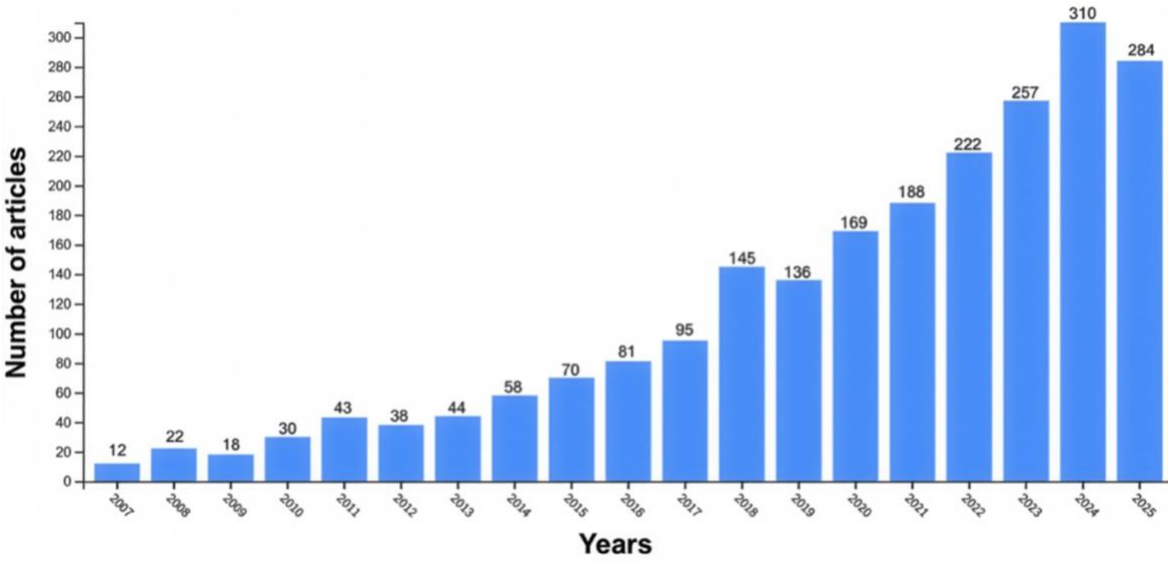

Figure 2.1 Number of articles on sustainable entrepreneurship in the last 20 years[1]

[1] Results on articles on sustainable entrepreneurship worldwide retrieved from the WoS database in the field of business and management (2007 to November 2025).

The search encompassed 20-40 years to include seminal theoretical contributions from established scholars. Beyond the capture of timeframe, the inclusion criteria were also designed to ensure relevance and quality, including peer-reviewed articles published in academic journals in the categories of business, management, green sustainable science technology, and construction building technology, as well as research that provided theoretical or empirical insights relevant to the study's objectives. Exclusion criteria eliminated studies published in a language other than English, research not specifically addressing green entrepreneurship topics, and studies examining sectors other than construction, architecture, or building systems. In total, this framework retained 526 peer-reviewed articles. The explained procedure is summarized in Figure 2.2 below.

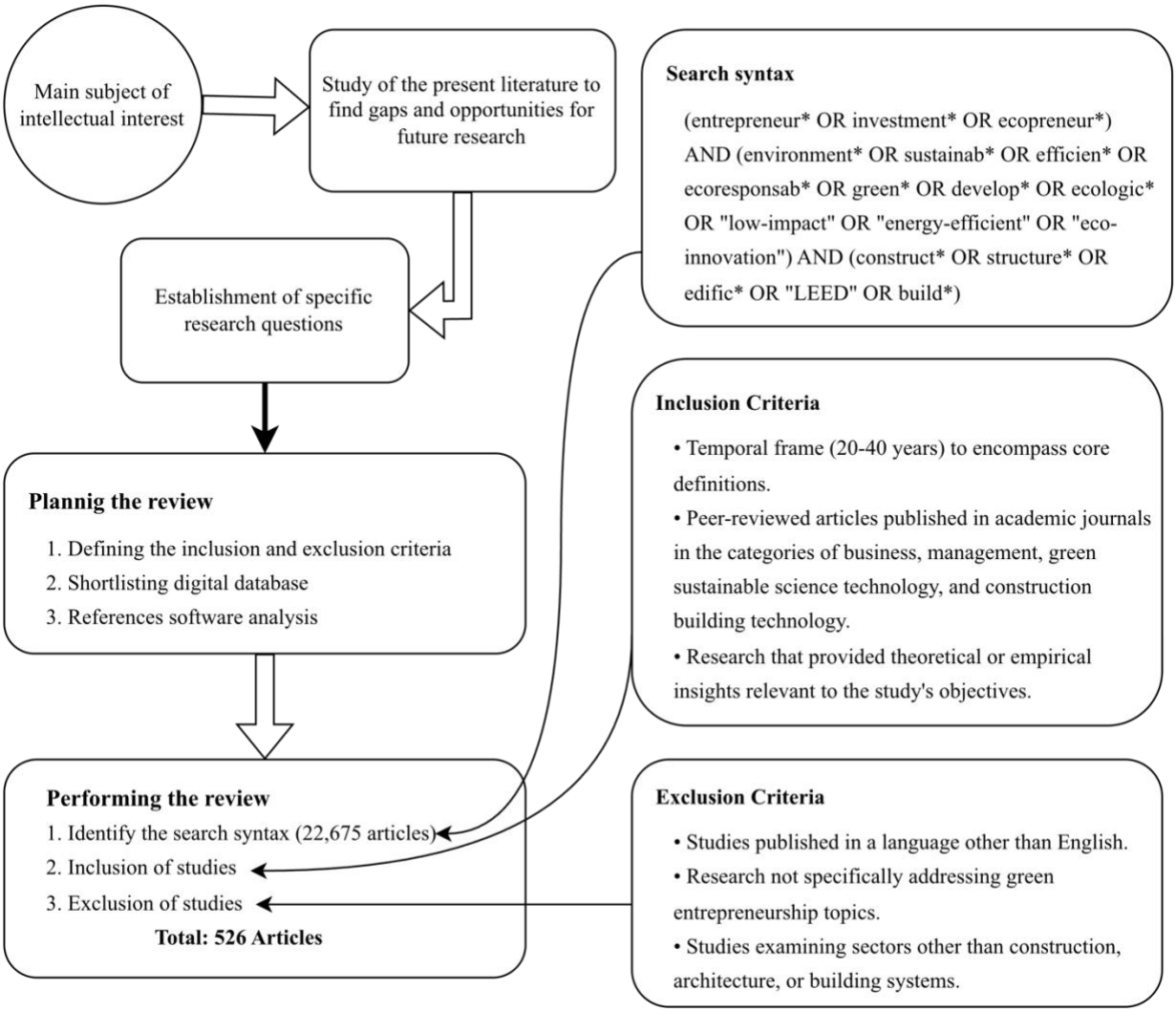

Figure 2.2 Systematic search structure of 526 peer-reviewed articles

Following the initial search, the selection of studies for in-depth analysis was conducted through a multi-stage screening process. First, duplicate records and clearly irrelevant studies were removed based on titles and abstracts. This included studies that, while classified within the selected subject areas, focused on unrelated topics (e.g., purely technical engineering analyses, bibliometric reviews, or studies lacking a clear link to green entrepreneurship). Second, full-text screening was conducted to assess the relevance of each study to the research objectives, with particular attention to contributions addressing green entrepreneurial processes in the built environment. This stage resulted in a reduced pool of core articles, as shown in Figure 2.3.

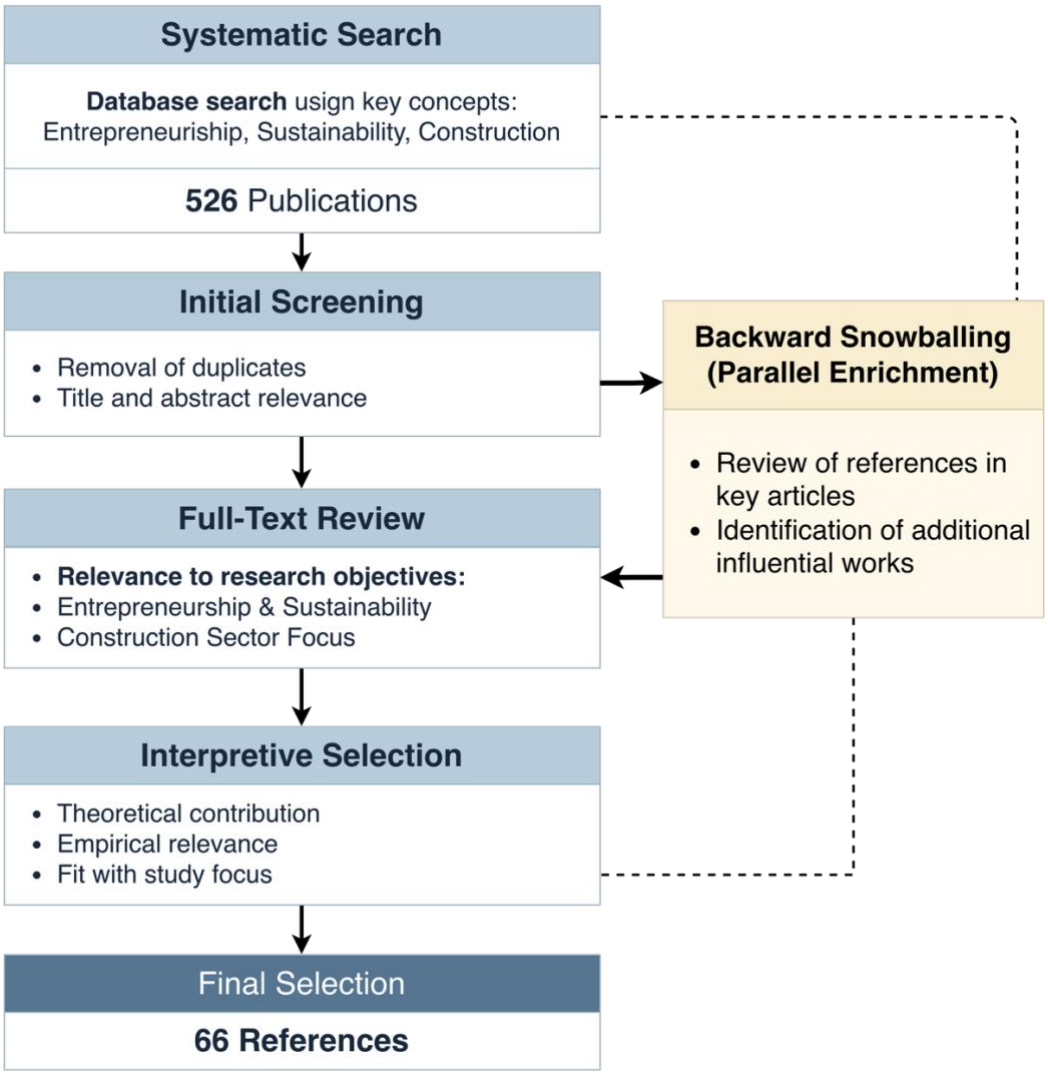

Figure 2.3 Interpretive selection of the literature review

The analysis of the selected literature was conducted using an interpretive approach guided by thematic lenses derived from the research focus. In particular, attention was given to identifying and synthesizing insights related to the drivers of green entrepreneurship, the role of innovation in sustainability, the challenges faced by eco-innovators, and the influence of policy and institutional frameworks. These dimensions provided a structured basis for comparing and interpreting the literature, allowing for the identification of recurring patterns, divergences, and research gaps. Figure 2.4 illustrates the analytical process followed in this study, combining a systematic search strategy with an interpretive and iterative thematic analysis.

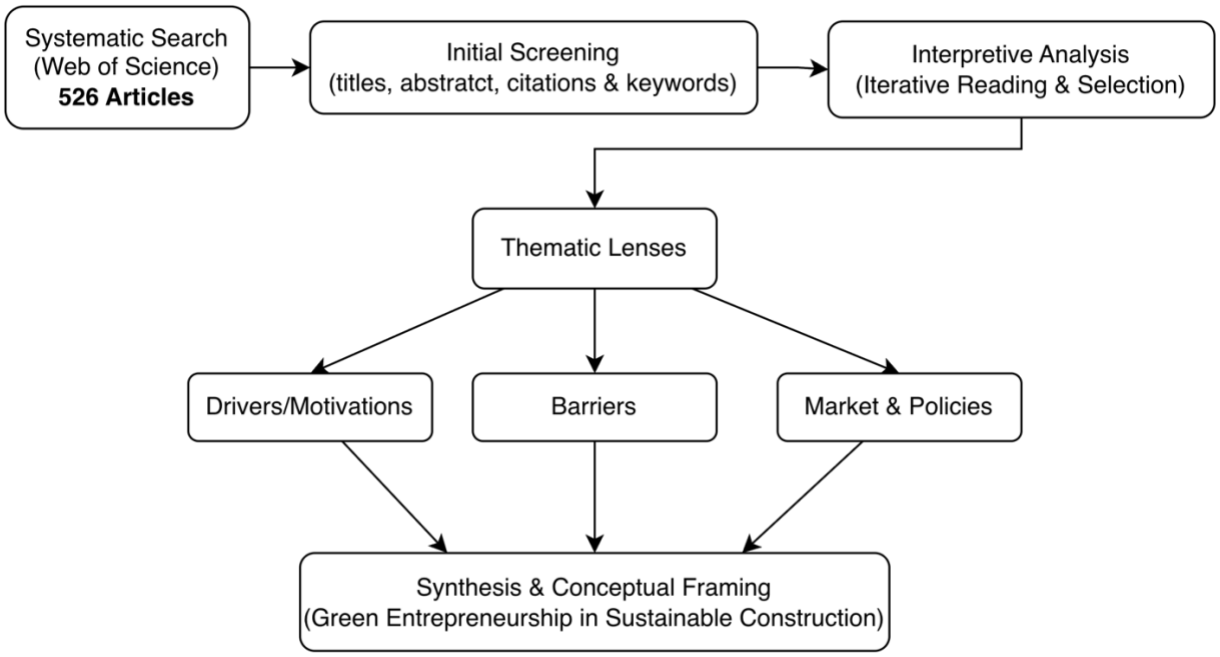

Figure 2.4 Analytical process of literature review

2.1 Entrepreneurship & Entrepreneurial Behavior

A central debate in entrepreneurship research concerns how entrepreneurs should be defined: whether through inherent individual characteristics, acquired competencies, or the actions they undertake within specific contexts. Early research predominantly adopted a trait-based perspective, seeking to identify stable personality attributes that distinguish entrepreneurs from other economic actors (e.g.,Karabulut, 2016; Kerr et al., 2018; Li et al., 2020). In parallel, other studies emphasized managerial and technical competencies, suggesting that entrepreneurial success depends on a combination of skills required to navigate venture creation and growth (Almahry et al., 2018; Lowden, 1988; Smith et al., 2007).

However, these perspectives have been increasingly challenged for their limited ability to consistently differentiate entrepreneurs from other actors such as managers or CEOs, who may possess similar traits and competencies without engaging in entrepreneurial activity. Studies by scholars such as Envick and Langford (2000), Kuratko (2009), and Zhao & Seibert (2006) point out that entrepreneurial skills are not necessarily the exclusive domain of entrepreneurs. Managers and business leaders may also possess these skills, yet still not be considered entrepreneurs. This reinforces the need for a multi-dimensional understanding of entrepreneurship. These limitations indicate that entrepreneurship cannot be defined by occupational roles or stable individual attributes, but rather by engagement in the process of new venture creation.

As pointed out by Gartner (1989), one of the pioneers in entrepreneurship studies, the entrepreneur is part of the complex process of new venture creation. “The entrepreneur is not a fixed state of existence; rather, entrepreneurship is a role that individuals undertake to create organizations.” (Gartner, 1989). This distinction is critical, as it separates entrepreneurs from actors such as CEOs or managers, whose primary function lies in administering and optimizing existing organizations rather than initiating their creation.

The variability of entrepreneurial outcomes across different contexts further challenges the validity of universal trait or skill-based definitions. In this regard, Shane and Delmar (2004) argue that entrepreneurial success is contingent upon the ability to navigate complex and uncertain environments, highlighting the contextual nature of entrepreneurial activity. This perspective shifts the focus away from purely individualistic explanations and toward a more nuanced understanding

that emphasizes the interaction between personal attributes and external conditions. From this viewpoint, entrepreneurship cannot be reduced to who individuals are, but must be understood in terms of how they act within and respond to the environments in which they operate.

Empirical research reinforces this argument by demonstrating the central role of structural and contextual factors. Schayek and Dvir (2009), for example, show that market conditions, access to resources, institutional frameworks, and social networks often exert a stronger influence on entrepreneurial outcomes than individual traits, particularly in small and resource-constrained ventures. In such contexts, success depends less on personality characteristics and more on the ability to mobilize resources, build strategic relationships, and adapt to environmental constraints.

Taken together, these perspectives challenge the explanatory power of trait-based approaches, suggesting that they overemphasize individual agency while underestimating the structural conditions that enable or constrain entrepreneurial activity. This implies that defining entrepreneurs solely through inherent characteristics is insufficient, reinforcing the need to consider entrepreneurship as a context-dependent process rather than a fixed individual profile.

As the limitations of universal, trait-based definitions have become increasingly evident, the field of entrepreneurship has expanded to account for the diversity of contexts and motivations that shape entrepreneurial action. Rather than seeking a single, unified profile of the entrepreneur, recent research has emphasized the emergence of distinct entrepreneurial archetypes, each reflecting specific value orientations and operational environments.

One prominent example is the “green entrepreneur,” defined by a core commitment to environmental sustainability and the pursuit of eco-innovative solutions (Gast et al., 2017). This category illustrates how entrepreneurial activity can be driven not only by economic opportunity but also by normative and ecological considerations. Importantly, the emergence of such archetypes reinforces the argument that entrepreneurship cannot be adequately understood through fixed individual characteristics alone. Instead, entrepreneurship is best understood as a context-dependent process of opportunity-driven venture creation, shaped by the interaction of individual motivations, environmental conditions, and resource constraints. Accordingly, this study adopts a process-oriented definition of entrepreneurship, focusing on entrepreneurial behavior as the enactment of opportunity recognition and venture creation within specific contextual conditions.

2.2 The Rise of Green Entrepreneurship: Context & Definitions

The emergence of green products, processes, and industries is not coincidental or merely a response to market trends; rather, it is a response to a growing awareness of a sustainability-focused value orientation among consumers (Buerke et al., 2017), underscored by the increasing visibility and severity of natural disasters in recent years (e.g. IPCC, 2022; UNEP, 2022), including hurricanes, wildfires, floods, and droughts that have brought the reality of environmental change into public consciousness. These growing concerns about the environment led to a period of significant investment and funding in new startups that focused on clean technologies in the early 2000s, creating what became known as a new wave of environmentally oriented entrepreneurship. This phenomenon was later referred to as the 'cleantech boom' (Schaper, 2010; Warren, 2007), a period characterized by substantial venture capital investment in renewable energy, energy efficiency, and environmental technologies, driven by growing awareness of climate change and resource depletion. Consequently, since then, there has been a rising demand for sustainable services and products to address the environmental challenges, creating market opportunities for entrepreneurs who can provide solutions (Lotfi et al., 2018).

Driven by this concern and the perception of significant market opportunities in environmental solutions, a new trend has emerged in the entrepreneurial landscape — eco-businesses (Harini & Meenakshi, 2012) that explicitly position environmental sustainability as a core value proposition. As a consequence, powered by companies seeking to capitalize on green markets, international institutions promoting sustainable development, and higher education institutions incorporating sustainability into their curricula, the number of research publications in sustainable entrepreneurship has also undergone an exponential increase in the last 20 years (Terán-Yépez et al., 2020; Tunçalp & Yıldırım, 2022) reflecting both the growing practical importance of this phenomenon and its increasing legitimacy as a field of academic inquiry.

In fact, the impact of shifting business practices towards environmental and social sustainability is a newly studied phenomenon, with most research emerging only in the past two decades. In the study of Tunçalp and Yıldırım (2022), the authors explore how the coverage of green entrepreneurship has changed worldwide in the last 20 years, analyzing keyword co-occurrences of companies identified with sustainability from 72 different countries to map the evolution of this

field. Tunçalp and Yıldırım (2022) concluded that growing trends in green entrepreneurship towards the Sustainable Development Goals (SDGs), the global framework adopted by the United Nations in 2015, have led to major vertical growth worldwide over the last two decades, resulting in an expanding market for businesses pursuing sustainability. This growth is evident not only in the number of ventures but also in the increasing sophistication of sustainable business models and the mainstreaming of sustainability concerns in entrepreneurship education and support programs.

Also known by various terms, including 'Ecopreneurship', 'Environmental Entrepreneurship', 'Enviropreneurship', and 'Eco-Entrepreneurship (EE)', Green Entrepreneurship (GE) refers to entrepreneurs and businesses that base their activities on sustainable, environmentally friendly, and green principles, seeking to minimize their impact on the environment (Gast et al., 2017). This definition highlights that green entrepreneurship is not merely about reducing negative impacts but about creating positive social and environmental benefits through entrepreneurial activity.

In its definition, Gerlach (2003) proposed that eco-entrepreneurs are individuals who identify market opportunities for innovations concerning sustainability, successfully implement these innovations, and create new products or services that address environmental challenges while generating economic returns. According to Volery (2002), a green entrepreneur is someone who seeks to transform a sector of the economy towards sustainability by starting a business in that sector with a green design (products or services designed with environmental considerations), green processes (production methods that minimize environmental impact), and a lifelong commitment to sustainability as a core value rather than a temporary strategy. Therefore, it is possible to conclude that this segment of entrepreneurship pursues environmental responsibility in its business model as an opportunity for growth rather than as a constraint or cost to be minimized, fundamentally reframing the relationship between business and the environment.

As supported by Belz and Binder (2017), traditional entrepreneurship mainly emphasises economic growth (Carpenter, 1943; Kirzner, 1973) and financial returns as the primary measures of success, while green entrepreneurship aims at balancing the triple bottom line of economic, social, and ecological goals (Cohen et al., 2008; Schaltegger & Wagner, 2011; Thompson et al., 2011), recognizing that long-term business success depends on maintaining healthy social and environmental systems. This distinction highlights the evolving nature of entrepreneurship and its ongoing transformation, as green entrepreneurship addresses not only financial obligations to

investors and owners but also social and ecological responsibilities to communities and future generations. This represents a fundamental shift in how entrepreneurial success is conceptualized and measured, moving from a singular focus on profit maximization to a more complex assessment that includes environmental and social impacts.

As shown in Figure 2.5, Yann and Nagy (2021) emphasize that, while green entrepreneurs incorporate sustainability alongside profitability as part of their core goals, traditional entrepreneurs focus mainly on financial gain, treating environmental and social considerations as secondary or instrumental to economic objectives. Thus, what distinguishes green entrepreneurs is their dedication to green innovation, making it the main focus of their growth efforts in the marketplace rather than a peripheral concern, which leads to the development and promotion of eco-friendly products, services, processes, and solutions as the central value proposition of their ventures. This distinction is not merely rhetorical; it has practical implications for how ventures are designed, how resources are allocated, and how success is evaluated.

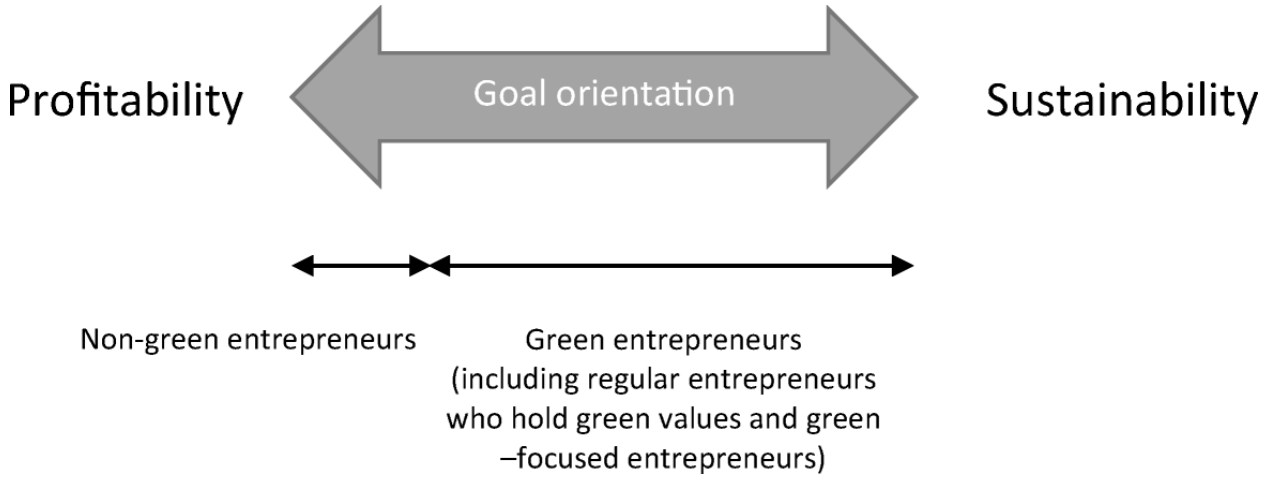

Figure 2.5 Goal orientation between non-green and green entrepreneurs[2]

Despite contrasting values and approaches, green entrepreneurs and traditional entrepreneurs share certain similarities that are important to recognize. Both segments of entrepreneurs share common industry factors, such as market challenges (including competition, customer acquisition, and

[2] Yann Truong and Brian G. Nagy, "Nascent Ventures' Green Initiatives and Angel Investor Judgments of Legitimacy and Funding," 2021, figure "Differences between Regular Entrepreneurs and Green Entrepreneurs."

scaling), competition density (the number of firms competing for similar opportunities), and capital needs (the requirement for financial resources to start and grow ventures).

The result of the study of Yann and Nagy (2021) indicates that potential investors may be more willing to accept green initiatives only on the basis that these green initiatives do not jeopardize the emergence and survival of the venture, suggesting that environmental goals must be balanced with economic viability. In other words, traditional agents in the market are more inclined to invest in green businesses if doing so does not negatively impact profits, as profitability remains the primary driving force behind most business decisions in capital markets. Overall, to maintain a healthy position in the market, both green and traditional entrepreneurs should focus on financial stability as the foundation of their ventures, recognizing that environmental and social goals can only be pursued sustainably if the venture is economically viable.

2.3 From Green to Green-Green Entrepreneurship

Introduced by Isaak (1998), business models that include green practices can be distinguished between "green business" and "green-green business". According to the author and further recognized by other scholars (Gibbs, 2006; Santini, 2017; Taylor & Walley, 2004), "green organizations" frequently start out as traditional companies with profit-driven goals before progressively implementing eco-friendly procedures as a response to external pressures or perceived opportunities. This shift might be caused by a number of factors, including stakeholder pressure-driven ethical considerations (demands from customers, employees, or communities), compliance with changing legislative frameworks (new environmental regulations), or the identification of competitive benefits through green branding (using environmental credentials to differentiate in the market).

On the other hand, Isaak's (1998) notion of "green-green enterprises" highlights a significant change in the way that people think about entrepreneurship and the relationship between business and the environment. According to the author, green-green enterprises have been environmentally conscious since their foundation, embedding green characteristics in their operations, vision, and goals from the outset rather than adopting them later in response to external pressures. Ecopreneurs, who see entrepreneurship as a vehicle to accelerate systemic change rather than just attain revenue or market share, are frequently the driving forces behind green-green firms. Their objectives

effectively challenge the typical bottom-line focus of traditional entrepreneurship by going beyond financial success to encompass environmental restoration, ecosystem regeneration, and societal well-being as equally important measures of success.

As part of their sustainability efforts, green organizations could, for example, include renewable energy sources in their operations, use energy-efficient production techniques to reduce costs, or cut back on waste output to minimize disposal expenses. Nonetheless, the primary objective of these organizations (maximizing income with environmental considerations as a secondary goal) remains consistent with conventional economic theories that prioritize shareholder value and profit maximization. For these businesses, sustainability is instrumental rather than intrinsic, adopted because it serves economic objectives rather than as an end in itself.

This gradual strategy fits in with the larger narrative of green entrepreneurship, later on studied by writers such as Schaltegger and Wagner (2011), who contend that companies implementing environmental practices frequently seek to align their operations with social norms and stakeholder expectations, without necessarily questioning accepted ideas of what constitutes financial success or fundamentally challenging the growth-oriented logic of capitalism. By standardizing eco-friendly practices and establishing industry standards, green enterprises contribute significantly to advancing sustainability by making environmental practices more mainstream and accessible; however, their influence is often limited to small-scale improvements rather than systemic change or transformation of the underlying economic model. This incremental approach has value in diffusing sustainable practices but may be insufficient to address the scale and urgency of environmental challenges.

In contrast, by creating new markets, promoting sustainable practices, and changing customer behavior, ecopreneurs in green-green companies seek to upend and change the industries in which they work. Isaak (1998), for instance, talks about how green-green companies put an emphasis on circular economy ideas, including using regenerative resources to maintain environmental sustainability or minimizing waste via product design. This strategy is in line with Shepherd and Patzelt (2011) research, which highlights that green entrepreneurs tackle environmental issues by radically changing market structures and encouraging innovation that benefits the environment and society.

As also noted by Taylor and Walley (2004), green-green firms provide a deeper, more revolutionary potential by challenging and altering the fundamental tenets of economic activity, questioning assumptions about growth, consumption, and the purpose of business in society. This distinction supports the claims made by Cohen and Winn (2007) that green entrepreneurship can have significant positive social and environmental effects by correcting market failures that lead to environmental degradation and social inequality. Similarly, by offering creative, scalable, and significant solutions to environmental problems, Dean and McMullen (2007) emphasize the vital role that entrepreneurial endeavors play in combating environmental deterioration and driving the transition to a more sustainable economy. Green-green entrepreneurs, in this view, are not merely adapting to environmental constraints but actively working to transform economic systems.

In conclusion, while both green business and green-green business models contribute to advancing sustainability, they differ fundamentally in their scope and transformative potential. Green-green entrepreneurs act as catalysts for systemic change by embedding environmental and social objectives at the core of their ventures, rather than treating them as secondary considerations. Unlike green businesses, which often operate within existing market logics and prioritize incremental improvements, green-green companies seek to redefine the purpose of economic activity itself. Through their innovations, advocacy, and commitment to alternative models of value creation, they challenge conventional growth paradigms and emphasize long-term ecological balance and societal well-being. As such, green-green enterprises represent a more robust and necessary response to contemporary environmental challenges, suggesting that meaningful progress toward sustainability requires not only adaptation within current systems but a fundamental transformation of them.

While the principles of green-green entrepreneurship offer a powerful vision for a sustainable economy, their practical application varies dramatically across different industries. The construction sector, with its profound environmental footprint and significant economic influence, represents a critical and complex arena for this transformation. It is an industry where the tensions between economic imperatives and ecological goals are particularly acute, and where the challenges of systemic change are deeply entrenched. Therefore, examining the sustainable construction sector provides a compelling case study to understand the real-world barriers and

opportunities that green entrepreneurs face when attempting to implement their transformative business models.

2.4 The Sustainable Construction Sector: Barriers & Opportunities

The construction industry occupies a critical position in the global economy and in efforts to address climate change and environmental degradation. As one of the largest sectors in terms of economic activity, employment, and resource consumption, construction accounts for a significant share of global carbon emissions, energy use, and waste generation (Huang et al., 2018). According to the United Nations Environment Programme (2021), the built environment (comprising residential, commercial, and infrastructure projects) accounts for approximately 36% of global energy consumption and nearly one-third of greenhouse gas emissions, making the transformation of construction practices essential to achieving climate goals. This environmental impact, combined with the sector's economic significance, makes sustainable construction a critical frontier for green entrepreneurship and innovation.

However, the path to sustainable construction is fraught with significant challenges that extend beyond technical considerations. A seminal and highly cited study by Häkkinen and Belloni (2011) established a critical insight that continues to shape understanding of the field: the primary obstacles to sustainable building are not the lack of advanced technologies or innovative materials, but rather deep-seated organizational and procedural barriers embedded in industry practices and institutional structures. Their comprehensive research identified five key categories of barriers that impede the adoption of sustainable building practices: inadequate steering mechanisms (policy and regulatory frameworks that fail to incentivize or require sustainable practices), unfavorable economics (perceptions that sustainable building is more expensive and concerns about return on investment), lack of client understanding (limited awareness among building owners and users about the benefits of sustainable design), process-related issues (challenges in procurement, project timing, inter-organizational cooperation, and professional networking), and a fragmented knowledge base (gaps in technical knowledge, lack of common language among professionals, and insufficient tools and resources for implementing sustainable practices).

This perspective is reinforced by other researchers, such as Hwang and Tan (2012), who fundamentally reframe the problem of sustainable construction from one of technological invention

(assuming that better materials or systems are needed) to one of process innovation and systemic change, recognizing that solutions often already exist but face barriers to implementation. Häkkinen & Belloni (2011) and Hwang and Tan (2012) research suggests that new technologies and sustainable materials are often resisted not because they are technically inadequate but because they disrupt established routines, introduce perceived risks to project timelines and budgets, and carry unforeseen costs related to learning, coordination, and regulatory approval.

Building on this understanding of barriers, research by Darko and Chan (2017) provides additional empirical evidence of the obstacles to green building adoption, identifying factors such as higher upfront costs, lack of demand from clients, inadequate government incentives, and resistance from industry professionals who are unfamiliar with or skeptical of sustainable practices. Their work confirms that the barriers to sustainable construction are multifaceted and interconnected, operating at individual, organizational, and institutional levels. The persistence of these barriers despite growing environmental awareness and the availability of proven sustainable technologies suggests that overcoming them requires more than technical solutions; it demands changes in industry culture, business models, regulatory frameworks, and professional education.

Despite these barriers, the sustainable construction sector also presents significant economic opportunities that are attracting entrepreneurial attention and investment. As shown in Figure 2.6, the global market for sustainable construction materials is projected to grow substantially, from USD 533 billion in 2025 to approximately USD 1,500 billion by 2034, according to market research Precedence Research (2025). The World Economic Forum (WEF) has identified approximately $1.8 trillion in global market opportunities from the transformation of the green building value chain, encompassing not only materials but also design services, construction methods, building technologies, and operational systems (World Economic Forum, 2024).

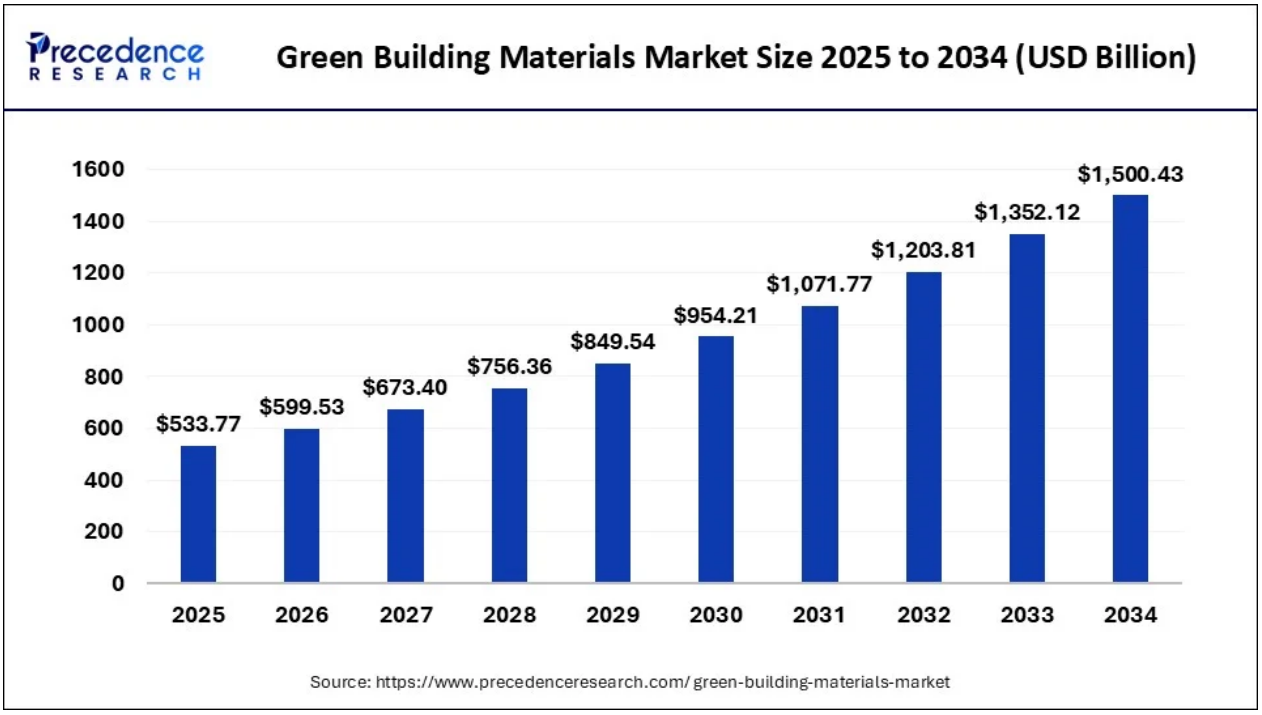

Figure 2.6 Green building materials market size 2025 to 2034 (USD Billion)[3]

This combination of significant barriers and substantial opportunities creates a unique context for green entrepreneurship in the construction sector. Entrepreneurs who can navigate the organizational and procedural barriers identified by Häkkinen and Belloni (2011) while capitalizing on the growing market demand for sustainable solutions occupy a critical position in the transition to a more sustainable built environment. However, the literature reveals that GE in construction is far from straightforward, characterized by complexity, contradiction, and the need for sophisticated strategies to balance environmental goals with economic viability.

Research by Gibbs and O'Neill (2014), based on an extensive qualitative study involving 55 interviews with actors in the UK's green building sector, reveals a far more nuanced and complex reality of green entrepreneurship than simplistic heroic narratives suggest. Their work challenges the notion of a monolithic "green entrepreneur" with a stable identity and consistent practices, demonstrating instead that individuals move fluidly between "green" and "conventional" business practices depending on market conditions, client demands, and project requirements. They argue

[3] Figure reproduced from the report "Green Building Materials Market Analysis by Application, End-use, and Region" published in Precedence Research on July 2025. (Reproduced with permission)

that the green building sector is not a coherent, consensual space characterized by shared values and collaborative relationships, but is rife with internal contradictions, competing business models, and conflicting interpretations of what constitutes "green" or "sustainable" practice. This research is vital because it embeds the study of GE within the broader framework of sociotechnical transitions theory, particularly the Multi-Level Perspective (MLP), which views change as a multi-level process involving the interplay of niche innovations (such as green building practices), established regimes (the conventional construction industry), and broader landscape pressures (such as climate change and energy costs).

This theoretical perspective positions green entrepreneurs not as isolated, heroic actors single-handedly transforming the industry, but as participants in a complex, often conflictual system in which they must navigate tensions between innovation and convention, environmental ideals and economic realities, and niche practices and mainstream acceptance. Gibbs and O'Neill (2014) findings suggest that green entrepreneurs in construction operate in a hybrid space, simultaneously working within the established industry to gain legitimacy and resources while attempting to challenge and transform its practices. This hybridity creates strategic dilemmas and identity tensions that shape entrepreneurial behavior and outcomes.

This complexity is further illuminated by the literature on Sustainable Business Model Innovation (SBMI), a critical area of research for understanding how green entrepreneurs create and capture value. A highly influential framework developed by Geissdoerfer et al. (2018) highlights the immense difficulty of successfully developing and launching sustainable business models that integrate environmental and social goals with economic viability. The authors argue that innovation must occur not only in the product or service itself, such as developing a new sustainable building material, but in the very logic of how the business creates value (the activities and resources used to deliver the offering), delivers value (the channels and relationships through which customers access the offering), and captures value (the revenue model and cost structure that enable the business to be financially sustainable). This requires a fundamental shift in thinking that many organizations fail to achieve, as it demands rethinking assumptions about customers, value propositions, and competitive advantage.

The challenge for green entrepreneurs in construction, therefore, is not simply to invent a green product or adopt a sustainable practice, but to design a viable business model that can survive and

thrive within a market that is often indifferent or even hostile to its core environmental values. This involves addressing the barriers identified by Häkkinen and Belloni (2011), such as client understanding, process integration, and regulatory approval, while also developing revenue models that can compete with conventional alternatives and attract the investment necessary for growth. The difficulty of this challenge is evidenced by the high failure rate of sustainable ventures and the tendency for green businesses to compromise their environmental goals in pursuit of economic survival, as documented in various studies of green entrepreneurship (Hockerts & Wüstenhagen, 2010; Johnson & Schaltegger, 2020)

2.5 Critical Review of Literature

This review of the literature reveals a rich but fragmented understanding of the intersection between green entrepreneurship and sustainable construction, providing important insights while also exposing significant gaps in knowledge. While we have a strong grasp of the systemic barriers to sustainable building through the work of Häkkinen and Belloni (2011) and others, and a growing appreciation for the complexity and fluidity of green entrepreneurship through research such as that of Gibbs and O'Neill (2014), several critical gaps remain that limit our understanding of how green entrepreneurship actually unfolds in practice within the construction sector. These "open doors" in the literature represent spaces where this study seeks to make its contribution, addressing questions that existing research has not adequately answered.

First, while the barriers to sustainable construction are well documented at a systemic level, there is a lack of research exploring how green entrepreneurs navigate these barriers in their day-to-day practice and lived experience. We know from Häkkinen and Belloni (2011) that organizational and procedural barriers exist, including regulatory obstacles, gaps in client understanding, and challenges in process integration, but we know far less about the specific strategies, adaptations, and compromises that entrepreneurs employ to overcome these barriers. How do entrepreneurs translate their environmental values into viable business practices when faced with clients who prioritize cost over sustainability? How do they manage the tension between innovation and the risk-averse culture of the construction industry? These process-level questions require qualitative inquiry that captures the context-dependent nature of entrepreneurial action.

Second, while frameworks for sustainable business model innovation exist, such as that developed by Geissdoerfer et al. (2018), there is a scarcity of research that examines the specific process of business model innovation in the context of green construction ventures. From opportunity recognition to venture creation, there is no straightforward process of identifying unmet needs; in the context of sustainable construction, it involves reframing problems, challenging assumptions, and seeing value where others see only operational hurdles. What role does their prior experience in traditional construction play in shaping their opportunity recognition? How do entrepreneurs develop and adapt their business models in response to the unique challenges of this sector, including fragmented supply chains and uncertain regulatory environments? What trade-offs do they make between environmental goals and economic viability? Understanding the actual process of business model development, rather than just the end result, is essential for supporting green entrepreneurship.

Third, while the fluidity of green entrepreneurial identity has been noted by Gibbs and O'Neill (2014), there is a need for deeper insight into the process of business commitment among green entrepreneurs in the building sector. How do entrepreneurs negotiate their own values and missions with the pragmatic demands of a market that is not always aligned with their environmental goals? How do they maintain commitment to sustainability when faced with pressures to compromise? What triggers the transitions between "green" and "conventional" practices that Gibbs and O'Neill observed? Understanding these business dynamics is crucial for explaining the conditions under which environmental goals are maintained or abandoned.

Fourth, Häkkinen and Belloni (2011) identified "lack of common language" and "knowledge gaps" as significant barriers to sustainable construction, but little research examines how green entrepreneurs act as knowledge brokers, bridging these gaps by translating across different professional communities, educating clients and collaborators, and diffusing sustainable practices. What strategies do they use to communicate the value of sustainability to skeptical audiences? How do they leverage the knowledge and capabilities of their supply chains and project partners? The role of entrepreneurs in disseminating knowledge in the green sector remains underexplored.

In conclusion, the literature provides the foundational knowledge of the problems facing sustainable construction and the general characteristics of green entrepreneurs, but it does not yet tell the full story of the entrepreneurial process in this specific context. It has opened the door by

identifying the systemic barriers (Häkkinen & Belloni, 2011), the complexity of green entrepreneurial identity (Gibbs & O'Neill, 2014), and the challenges of sustainable business models (Geissdoerfer et al., 2018), but it has left unanswered the question of how individual entrepreneurs, in their lived experience and daily practice, navigate these challenges.

This study aims to step into that space, using qualitative inquiry to explore the "how" behind the "what", to understand the dynamic, adaptive, and deeply personal processes that constitute the lived experience of green entrepreneurship in the sustainable construction sector. By examining the actual practices, strategies, and experiences of green entrepreneurs in construction, this research seeks to close the doors that the literature has opened, providing insights that can inform both theory and practice in this critical field.

CHAPTER 3 METHODOLOGY

This chapter outlines the methodological framework employed in this study to investigate the phenomenon of green entrepreneurship within the building sector. The research is qualitative in nature, aiming to provide a rich and in-depth understanding of the motivations, challenges, and strategies of entrepreneurs who are driving sustainability in the construction industry. This chapter details the research design, data collection methods, participant selection, and the procedures for data analysis. The methodology was carefully chosen to ensure a rigorous investigation that aligns with the research questions and objectives.

The research employed a semi-structured interview methodology for data collection whose guide was developed through an iterative and theory-informed process, ensuring alignment with the study's research objectives. Drawing on key constructs identified in the literature on entrepreneurship and sustainable innovation, the guide was structured around three thematic areas: (1) opportunity recognition and exploitation, (2) impact of external stakeholders, and (3) market influences and growth dynamics.

The first section of the interview guide focuses on how entrepreneurs identify, evaluate, and exploit opportunities related to sustainability. This section is grounded in the opportunity-based view of entrepreneurship, which conceptualizes entrepreneurial action as the recognition and exploitation of market opportunities (Shane & Delmar, 2004). In the context of sustainable entrepreneurship, opportunities often emerge from market imperfections and environmental challenges (Cohen & Winn, 2007; Dean & McMullen, 2007). Accordingly, questions in this section explore how entrepreneurs, particularly in the construction industry, exploit sustainability as an opportunity, assess its viability, and integrate it into their strategic and operational practices.

The second section examines the role of external actors in shaping the adoption of sustainable practices. Studies on sustainable entrepreneurship emphasize that market dynamics, regulatory frameworks, and societal expectations play a critical role in enabling or constraining sustainability-oriented action (Gast et al., 2017; Schaltegger & Wagner, 2011; Terán-Yépez et al., 2020). In the construction sector specifically, prior research identifies significant barriers and drivers related to regulation, costs, technological constraints, and stakeholder pressures (Darko & Chan, 2017; Häkkinen & Belloni, 2011; Hwang & Tan, 2012). Therefore, the questions in this section were

designed to capture how entrepreneurs navigate the influence of external actors, such as clients, investors, and industry professionals, on entrepreneurial decision-making regarding sustainable practices.

The third section addresses the impact of sustainability on firm development and market dynamics. This part of the interview guide is grounded in literature on sustainable business models and innovation, which highlights how environmental practices can shape competitive advantage and long-term firm performance (Geissdoerfer et al., 2018; Parida & Wincent, 2019). Additionally, research on sustainable entrepreneurship underscores the role of innovation and ecosystem support in enabling firm growth and scaling (Belz & Binder, 2017; Theodoraki et al., 2022). Questions in this section, therefore, explore how sustainability affects the building industry outcomes, competitiveness, and future strategic positioning within the evolving green construction sector.

Overall, the structure of the interview guide ensures a direct alignment between theoretical constructs, research objectives, and empirical data collection, enabling a comprehensive analysis of entrepreneurial behavior within the context of sustainable construction.

This research adopts an interpretivist epistemological stance, which assumes that social realities are constructed through the meanings and experiences of individuals (Creswell & Poth, 2018; Saunders et al., 2023). Within this perspective, qualitative methods are particularly appropriate for exploring how entrepreneurs interpret and navigate the complex dynamics of sustainable construction markets. Rather than seeking objective measurement, the study focuses on understanding participants' perspectives and interpretations in order to identify patterns and mechanisms shaping green entrepreneurship.

3.1 General Approach

An ethics approval certificate was first obtained from the Research Ethics Committee of Polytechnique Montréal (CER-2425-35-D), in order to begin data collection (see APPENDIX A). The purpose of the approval request is to ensure that all processes involved in data collection (recruitment of participants, data collection, storage, and data analysis) comply with the rules of Polytechnique Montréal. This is done both to protect the participants and to ensure the reproducibility of the study should another team of researchers need to conduct an audit.

3.2 Data Collection

The primary data for this study were collected through semi-structured interviews with entrepreneurs in the construction, architecture, building systems, and consultancy sectors. This method was selected to facilitate a flexible yet focused exploration of their experiences, perspectives, and practices, allowing for the detailed narratives that more structured methods like surveys might not capture.

Potential participants were purposefully selected based on a clear set of criteria. First, they had to be directly involved in entrepreneurial activities within sustainable construction, architecture, or related sectors. Second, their companies needed to demonstrate a tangible commitment to sustainability, showing how their services or products generate environmental benefits. Third, company age and evidence of recent green projects or products were also considered. These criteria guided the focus toward Small and Medium-sized Enterprises (SMEs), typically in their early stages of development.

This strategic focus was adopted for two main reasons:

a. SMEs and younger firms provide more direct access to the founding entrepreneurs — the visionaries responsible for the company's green mission. In contrast, within larger, more established corporations, identifying the specific individuals who initiated and drove the sustainability transition can be challenging due to complex organizational structures.

b. Targeting newer ventures allowed for the inclusion of seasoned entrepreneurs who may have founded multiple companies over a long career. For instance, some participants had decades of entrepreneurial experience but were interviewed in the context of their most recently founded green enterprise. This approach ensured the focus remained on the founding ideals and implementation of green principles from the ground up.

The participant recruitment process occurred in two waves. Firstly, the initial pool of candidates for the study was identified through the Conference of Grand Batimatech 9th edition, and later on, from a list of green companies' partners of Batimetch, the non-profit organization focused on sustainable development in construction and technology, and a partner of Polytechnique Montreal, available on the JeBatimatech website. A second wave of observed green entrepreneurs was sourced from business-focused search engine platforms, such as F6S (a platform that helps

founders and startups with funding, investment, and pitching) and Ensun (a B2B search engine / supplier-sourcing platform that helps companies find suppliers or partners globally using AI & data-enriched profiles).

Moreover, to ensure that companies met the sustainability criteria, a dedicated review of their online presence was conducted. First, each company's official website was examined (particularly the "About Us" section) to verify their commitment to sustainable practices. When available, the company's LinkedIn profile was also analyzed to gather complementary information. Additionally, research was conducted on the company's founder or main entrepreneur via the "Team" section of the website, focusing on their professional background and entrepreneurial activities. This step was complemented by an examination of their LinkedIn profile, specifically the "About" and "Experience" sections. Only the entrepreneurs and companies that demonstrated clear alignment with the established sustainability criteria were selected for the interviews.

Initial contact was established between October 2024 and March 2025. The invitation to participate in the research was made via professional email addresses obtained from official company websites or LinkedIn profiles. Upon acceptance, virtual interviews were scheduled and conducted on platforms like Zoom and Google Meet. Each session, lasting between 60 and 90 minutes, was audio-recorded with the explicit consent of the participant. The recordings were then transcribed verbatim to ensure the accuracy and integrity of the data for subsequent analysis. To provide full transparency and context for the findings, the semi-structured interview guide is available in APPENDIX B.

The data collection was conducted between February and June 2025, during which a total of 13 participants were interviewed for this study. Given the time constraints and the challenges associated with accessing participants, the chosen sample size represented a realistic and sufficient number of participants for generating meaningful insights and attaining thematic saturation. Figure 3.1 shows the percentage breakdown of the various sectors represented in this study, illustrating the distribution of participants across different fields. The participants' business sectors include building materials manufacturing, green building consultancy, project management firms, solar energy companies, water management enterprises, and architectural practices.

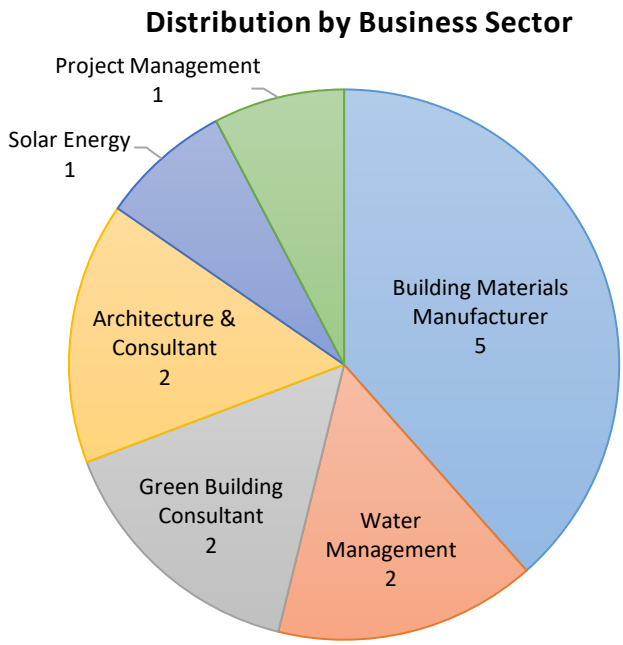

Figure 3.1 Distribution of interviewed participants by business sector

The temporal dimension of entrepreneurial activity, specifically when ventures were founded and how long they have been operating, was considered highly important for this research. The founding year provides critical context for understanding the evolution of the green building market, the changing nature of opportunities available to green entrepreneurs, and the different challenges faced by pioneers versus more recent entrants.

In this study's sample, as shown in Figure 3.2, 38% of participants have been in the market for less than 5 years, representing the most recent wave of green entrepreneurship and reflecting the accelerating pace of new venture creation in sustainable construction. Meanwhile, 69% of participants have less than 10 years of experience in their current green building ventures, indicating that the majority of the sample consists of relatively young companies that emerged after 2010.

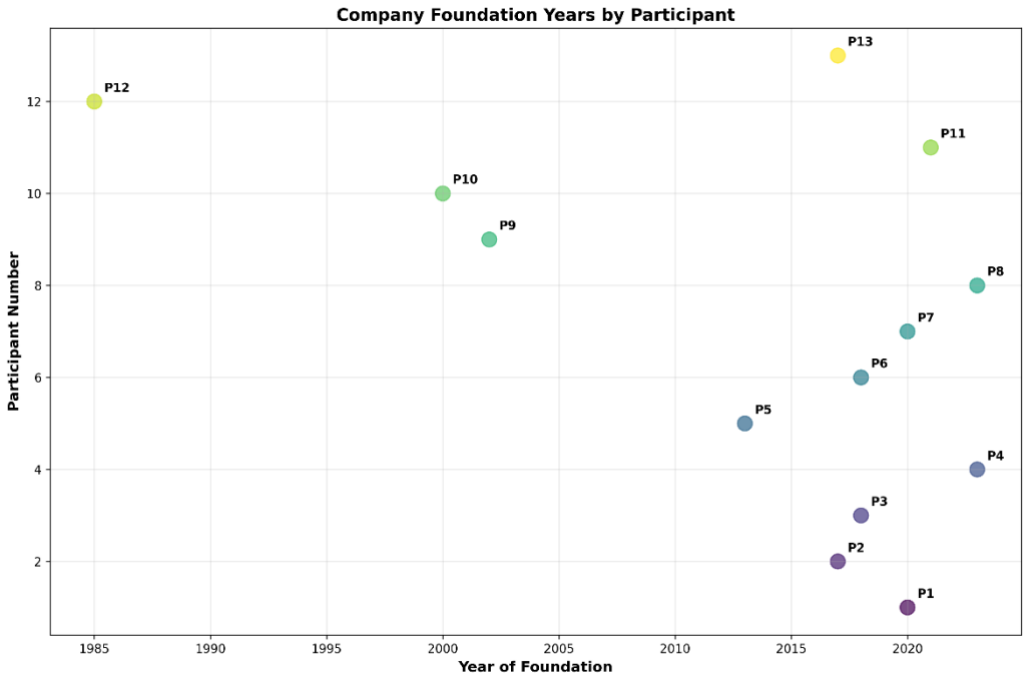

Figure 3.2 Company foundation years by participant

3.3 Data Analysis

In qualitative research, the researcher plays an active role in both producing and interpreting data (Braun & Clarke, 2006; Creswell & Poth, 2018). The conducted interviews were shaped through interaction between the researcher and participants, and the thematic analysis involved interpretive judgment in identifying patterns and themes within the narratives. Recognizing this role, the analysis followed a systematic coding procedure and transparent documentation of analytical decisions to enhance rigor and consistency in interpreting the empirical data.

The qualitative data analysis followed a systematic approach designed to identify patterns and themes within the entrepreneurial narratives while maintaining analytical rigor. The 13 interviews were transcribed verbatim immediately following data collection to preserve the authenticity and nuance of participants' responses. The transcribed data were then imported into NVivo 15, a qualitative data analysis software, to facilitate systematic coding and thematic analysis.

The analytical framework employed a three-tiered coding structure based on established qualitative research methodologies (Gioia et al., 2012). This approach progressed from descriptive first-order codes, derived directly from participant language and experiences, to interpretive second-order

themes that captured underlying patterns, and finally to aggregate dimensions that represent the overarching theoretical constructs emerging from the data.

First-order coding involved an inductive analysis of the interview transcripts, where codes were developed to capture participants' own terms, concepts, and descriptions of their entrepreneurial experiences. This initial coding phase remained close to the data, preserving the voice and perspective of the entrepreneurs while identifying recurring concepts and experiences across interviews. Second-order themes were developed through an iterative process of comparing first-order codes to identify broader patterns and relationships. This phase involved moving from descriptive to interpretive analysis, where similar first-order codes were grouped into conceptually coherent themes that captured underlying dimensions of the entrepreneurial experience in the green building sector. Lastly, aggregate dimensions represent the highest level of abstraction, where second-order themes were further synthesized into overarching theoretical constructs. A sample of the coding process is illustrated in Figure 3.3. This analysis sample revealed two primary aggregate dimensions: market opportunity identification and venture creation, and perceived challenges and opportunities, which collectively constitute part of the "green entrepreneurial journey" section.

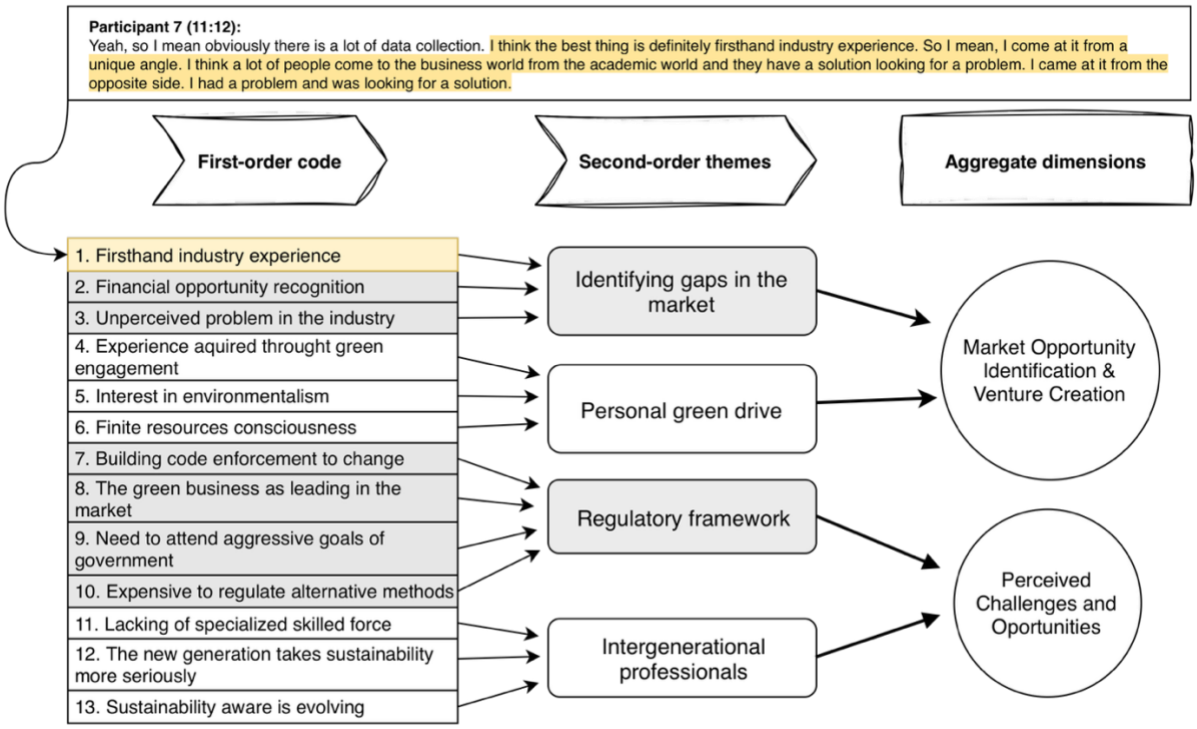

Figure 3.3 Data analysis structure in NVivo 15 with a three-tiered coding structure

The coding process followed an inductive approach. The analysis was guided by the systematic procedures of the Gioia methodology (Gioia et al., 2012), which is specifically designed to enhance rigor and transparency in qualitative research.

Several strategies were employed. First, first-order codes were grounded as closely as possible in participants' own terms, limiting premature abstraction. Second, second-order themes were developed through constant comparison across interviews, ensuring that emerging concepts were supported by multiple data instances rather than isolated interpretations. Third, the progression from first-order concepts to aggregate dimensions was conducted iteratively, with themes reviewed and refined multiple times to ensure internal consistency, conceptual clarity, and strong alignment with the underlying data.

The coding process was conducted iteratively, with regular reviews and refinements to ensure consistency and theoretical coherence. Inter-coder reliability was maintained through systematic documentation of coding decisions and regular reflection on emerging patterns. This structured approach enabled the identification of both convergent themes across participants and divergent experiences that illuminate the complexity of green entrepreneurship in the construction sector.

CHAPTER 4 RESULTS

To investigate the research's objectives, the results are organized into three comprehensive themes. To explore research objective one, how green entrepreneurs identify, evaluate, and exploit opportunities for venture creation within the sustainable construction sector, Theme 1 traces the green entrepreneurial journey, highlighting the process of opportunity recognition, targeting market identification for business establishment, and the perceived challenges encountered along the way. For research objective two, to examine how key actors (including clients, investors, and professionals) shape the adoption and development of sustainable practices within the construction sector, Theme 2 focuses on the role of stakeholders, analyzing how entrepreneurs confront the persistent knowledge gap between clients and professionals and the barriers faced by them in adopting green products and services. Finally, to analyze research objective three, market and innovation dynamics that influence the growth and sustainability of small and medium-sized enterprises (SMEs) operating within the green building sector, Theme 3 investigates the market dynamics, emphasizing competitive interactions, entrepreneurial support, regulatory developments, and the broader influence of environmental policies on green ventures.

4.1 Theme 1: The Green Entrepreneurial Journey

The first major theme emerging from the interview data centers on the entrepreneurial journey itself — the complex, multifaceted process through which individuals identify opportunities for sustainable innovation within the construction sector, develop viable business models to pursue those opportunities, and navigate the challenges of establishing and sustaining green ventures in an industry that has historically been resistant to change and characterized by conservative practices. This theme encompasses five dimensions that together reveal the lived experience of green entrepreneurship in construction: the cognitive and experiential processes of market opportunity identification, the entrepreneurial compromises in pursuit of sustainability, the evolution of market entry, client segment dynamics, and the structural challenges of venture creation and future perspectives. These five dimensions are iterative aspects of the entrepreneurial journey that unfold simultaneously and influence one another in complex ways.

4.1.1 Market Opportunity Identification

The interviewed green entrepreneurs identified viable market opportunities by challenging inefficiencies embedded in conventional industry practices. They perceived a gap between standard construction processes, characterized by material waste, high disposal costs, and resource inefficiency, and more sustainable alternatives capable of delivering the same functional outcomes with reduced environmental and economic impact.

Participant 7, a company founder specializing in modular building materials made from recycled construction waste, exemplifies this process of opportunity identification stemming from direct industry experience. He observed that the costs associated with waste treatment and disposal were particularly high in previous construction projects where he had worked, which led him to question why an industry so intensely focused on cost control, efficiency, and profit margins would tolerate such substantial waste-related expenses without seeking alternatives. This cost inefficiency is clearly illustrated by the participant:

> We realise that over a third of the project costs were allocated to waste management […]. So, you're looking at 15 to 30% wasted materials on each type of material that you order. Materials damaged in shipment, materials unused on a job site that have to be landfilled, and the cost of bin rental. (Participant 7)

This excerpt highlights how waste is not only an environmental issue but a significant and measurable economic inefficiency, which directly motivated opportunity recognition. This realization prompted the exploration of construction waste as a business opportunity, transforming what is typically perceived as a financial and environmental burden into a potential source of value through material recovery and reuse.

Similarly, Participant 8, who developed a business producing concrete from mining waste, identified an opportunity by questioning why potentially valuable materials were systematically discarded. Drawing on his experience in the mining industry, he observed that large quantities of waste remained unused despite their potential for alternative applications. This is made clear through the participant’s response:

> So, they just collected those things [wasted material] and didn't do anything with them. […] maybe we could produce concrete out of these things, […] and then we produced those things, like a small amount. (Participant 8)

This excerpt highlights how opportunity recognition emerged from questioning established disposal practices and exploring the potential of cross-industry resource use. It also reflects the experimental nature of early-stage venture development, where ideas are tested through research and small-scale production. The limited initial output underscores both the uncertainty of the innovation process and the challenges of introducing unconventional materials in a risk-averse construction industry.

Beyond waste management, opportunities identified by participants extend across multiple domains of sustainable construction. These include energy efficiency (e.g., P1's renewable energy systems), water conservation (e.g., P2's rainwater harvesting and greywater reuse), indoor environmental quality (e.g., P11's use of non-toxic materials), and sustainable materials (e.g., P8's recycled construction products). Importantly, these initiatives are not driven solely by profit-seeking, but also by a combination of dissatisfaction with conventional practices and strong environmental values. Participants consistently expressed a critical stance toward traditional methods, viewing them as both inefficient and environmentally problematic.

In this context, the interviewed green entrepreneurs appear particularly well-positioned to identify and target unmet market demands in traditional construction. This critical perspective, cultivated through the distinctive combination of deep industry experience and strong environmental consciousness, enabled them to recognize emerging opportunities that others may overlook, either because they lack the industry knowledge and technical expertise to understand the significance of certain inefficiencies and problems or because they lack the environmental values and commitment to see these problems as worth solving through entrepreneurial action.

The findings reveal that the development of green entrepreneurship in the construction sector unfolds across several interrelated dimensions. First, the timing of entrepreneurial entry reflects broader phases of market development. Second, the types of clients served by entrepreneurs evolve alongside the maturation of the sector. Third, entrepreneurs adapt their business models in response to changing market conditions and structural constraints. The following subsections, therefore,

examine these dynamics through three complementary perspectives: the evolution of market entry, shifts in client segments, and the strategic compromises entrepreneurs adopt in order to sustain their ventures.

4.1.2 Evolution of Market Entry

The study identifies a clear evolution in market entry across different segments of sustainable construction, reflecting changes in both technological development and market awareness. This evolution can be understood through three distinct waves (see Figure 4.1), moving from early value-driven initiatives to more mature and innovation-driven business models.

Firstly, Wave 1 (1980–1997) is characterized by pioneers and early adopters who integrated sustainability into their practices in a largely undeveloped market. During this phase, business models were typically small-scale, locally oriented, and driven by strong environmental values rather than profit maximization. Limited market awareness meant that projects depended heavily on committed clients and personal dedication.

Participant 9 illustrates this early context, describing a period in which sustainability projects were enabled by deeply aligned values between stakeholders:

> The clients were like dream clients […] They were very devoted**,** and everybody put in time […] without getting their salary […] that project was only possible because […] our values were aligned. (Participant 9)

This excerpt highlights the extent to which early sustainable construction initiatives relied on shared commitment rather than conventional economic incentives. As further emphasized by Participant 9:

> You don't do it to save money. (Participant 9)

Together, these accounts demonstrate that Wave 1 was defined by a grassroots, values-driven logic, where projects were sustained by personal engagement and ideological alignment rather than market demand or financial return. These initiatives were sustained by early adopters whose personal dedication compensated for not working with clients who lacked sustainability awareness and market structures that provided limited operational support.

The second wave (1997–2013) is characterized by the gradual mainstreaming of sustainability within the construction industry. During this period, participants (P3, P10, and P11) describe a shift in industry sustainability awareness toward greater professionalization, increased use of green certifications, and the introduction of government regulations. Business models evolved accordingly, with a move toward business-to-business (B2B) relationships, consulting services, and more scalable service-based offerings.

Participant 11 illustrates this shift by describing the changing profile of clients and practitioners:

> Before, it was mostly self-builders […] now we see teachers, engineers, professionals saying: "I want an ecological house, but I don't feel like building it myself" […] and that's when I saw the need. (Participant 11, translated).

This excerpt highlights a key transition in the market: sustainability moved from a niche practice driven by highly involved individuals to a more structured and professionalized service offering. As demand expanded, clients increasingly sought expertise rather than direct involvement, creating opportunities for specialized firms and formalized industry roles.

The third wave (2013–2025) is defined by a shift toward performance-driven and system-oriented approaches to sustainability. Participants (P2, P4, P5, P6, P7, P8, P13) describe an industry increasingly shaped by data-driven methodologies, Whole-Life Carbon Assessments (WLCA), and digital tools, reflecting a growing emphasis on measurable environmental impact and accountability. Business models have evolved accordingly, with the emergence of performance-based contracts and more integrated, system-level solutions.

However, this shift has also exposed structural constraints, particularly in relation to regulatory frameworks. Participant 2 highlights these challenges:

> The barriers to entry are excessively high. […] innovation, by definition, falls outside the standard. So not only do you need to be certified, but you also have to develop, a new standard to frame the innovation. So, it becomes extremely burdensome to handle. (Participant 2, translated)

This account illustrates a central tension of the third wave: while sustainability practices are increasingly driven by innovation and performance metrics, regulatory systems often lag behind.

As a result, firms introducing new solutions must navigate complex certification processes and, in some cases, contribute to the development of new standards themselves. This creates a structural bottleneck that slows the diffusion of innovation despite growing market demand.

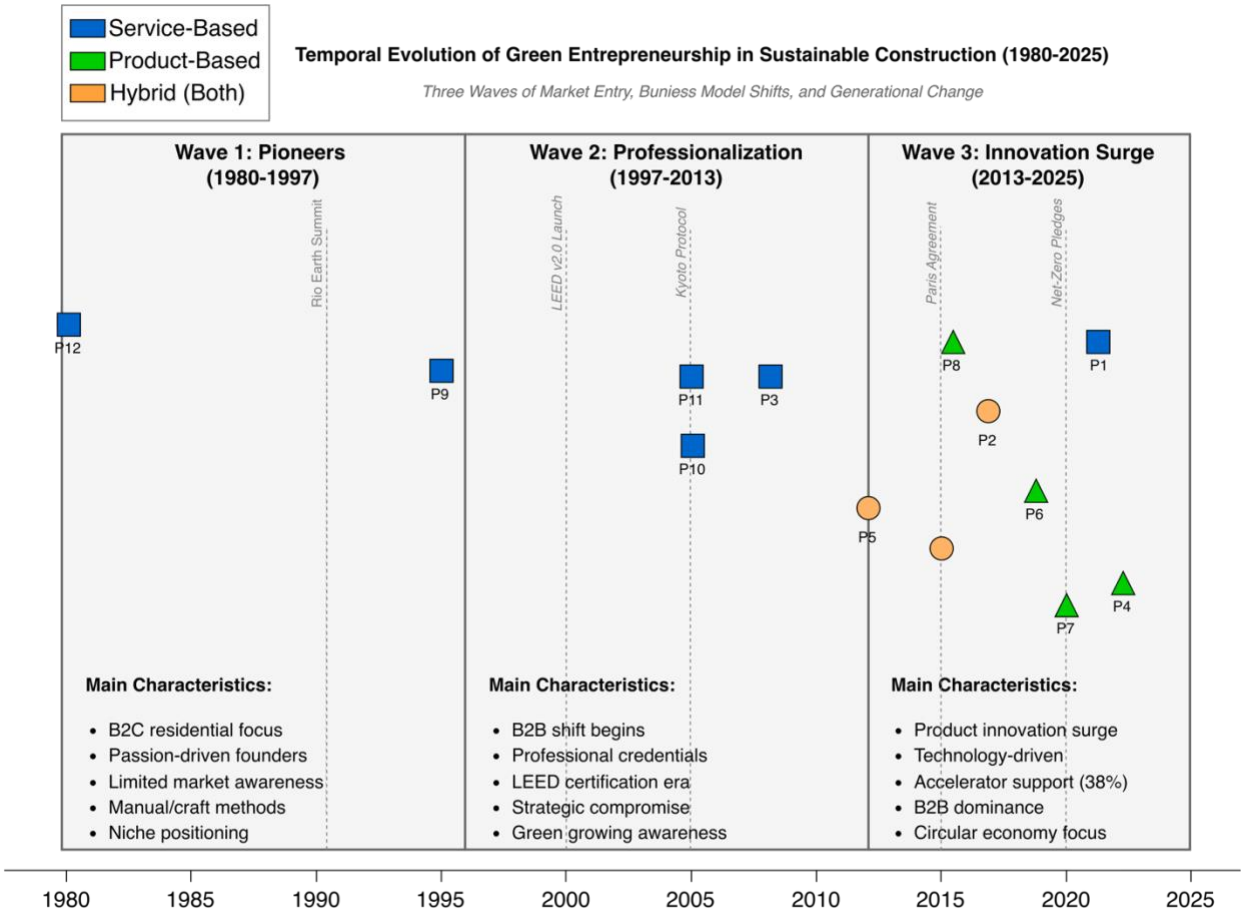

Figure 4.1 Temporal evolution of ventures in green building (1980-2025)

Figure 4.1 visually synthesizes the temporal evolution of market entry patterns across the three identified waves, highlighting shifts in both entrepreneurial profiles and dominant business models. In Wave 1 (1980–1997), the figure shows a small number of participants (P9, P12) concentrated in service-based activities, reflecting a niche, residential B2C orientation driven by values and craftsmanship. Wave 2 (1997–2013) displays a broader distribution (P3, P10, P11), illustrating the transition toward professionalization, with increased alignment to B2B markets and the emergence of certification-driven practices such as LEED. In Wave 3 (2013–2025), the figure reveals a clear expansion in both the number and diversity of participants (P1, P2, P4, P5, P6, P7, P8, P13),

alongside a visible shift toward product-based and hybrid business models. This distribution reflects the growing importance of technology-driven solutions, innovation-oriented ventures, and ecosystem support mechanisms such as accelerators. The inclusion of key global events further situates these shifts within broader institutional and environmental developments, reinforcing the link between external pressures and market transformation.

Taken together, the three waves illustrate a clear trajectory of market maturation in sustainable construction. The sector evolves from a values-driven, niche practice led by pioneers, to a more structured and professionalized market, and ultimately to a performance-oriented and innovation-driven ecosystem. This progression is accompanied by a fundamental shift in business models, moving from predominantly service-based activities toward product-based and hybrid approaches that leverage technology and scalability. However, despite this increasing sophistication, the findings also highlight persistent structural tensions, particularly between rapid innovation and slower-moving regulatory frameworks, which continue to shape entrepreneurial strategies and constrain the pace of transformation within the industry.

4.1.3 Client Segment Dynamics

Analysis of the participants' entrepreneurial timelines, as illustrated in Figure 4.2, reveals a clear pattern in the evolution of client segments within the green building sector, particularly in the shift from Business-to-Consumer (B2C) to Business-to-Business (B2B) activities over time.

Early entrepreneurial activity, spanning from the mid-1980s to the early 2000s, is overwhelmingly concentrated in the B2C segment. During this period, participants such as P9, P10, P11, and P12 operated primarily in professional service roles, including sustainable architecture and green building consulting, working directly with homeowners and small-scale developers. This reflects the historical context in which sustainable construction remained a niche and marginal practice, driven by a limited number of highly committed individuals rather than a structured or widely recognized market.

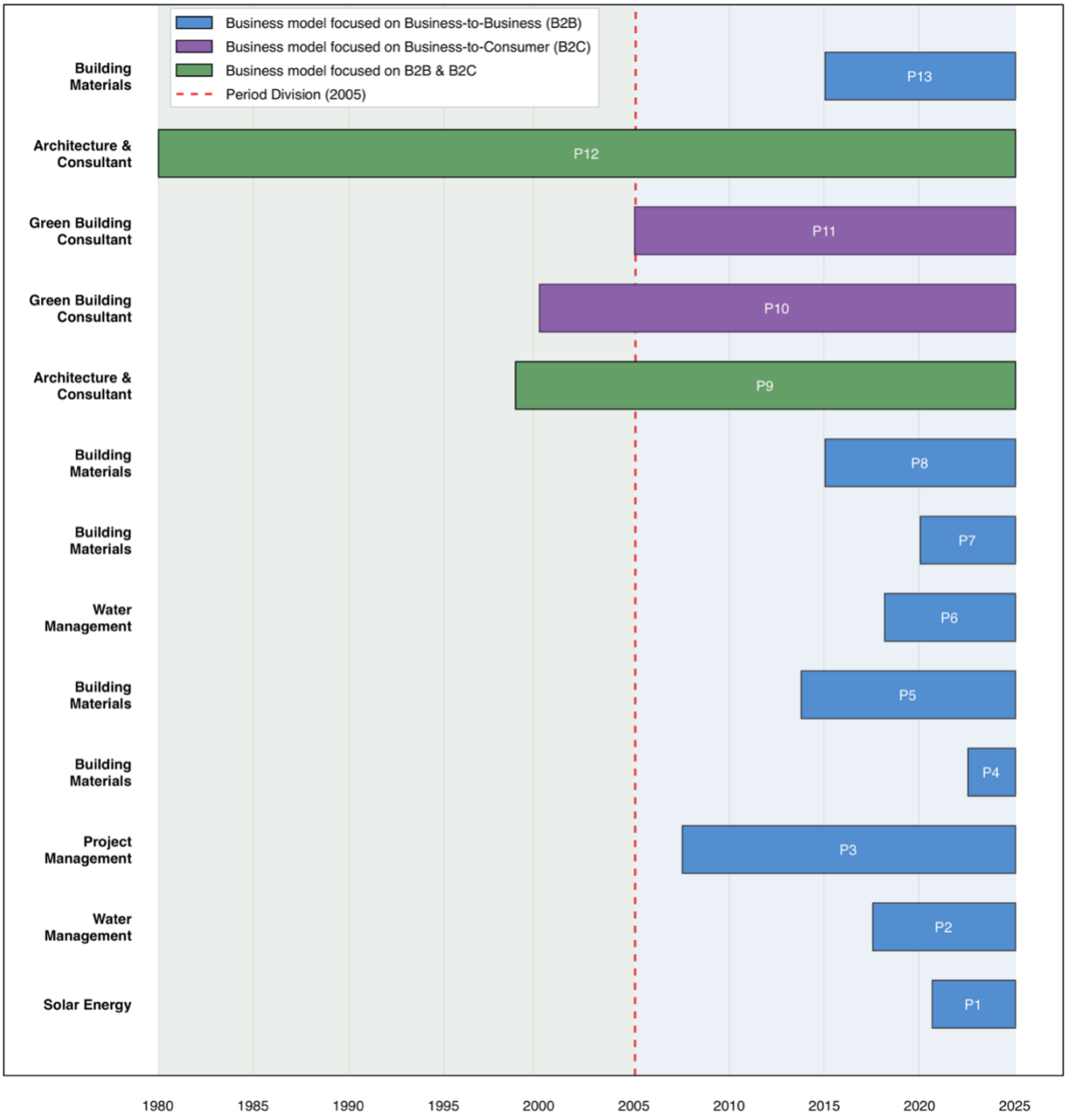

Figure 4.2 Entrepreneurial timeline: Green business activities (1980-2025)

Participant 12's experience further illustrates the early dynamics of B2C-oriented sustainable construction practices. Reflecting on more than four decades of professional activity in sustainable architecture and consulting, the participant describes how early work in the field was not initially approached as a formal business but rather as a personal practice driven by values and creative interest:

> Thinking about what I do as a business is pretty recent […] maybe over the last ten years. Before that, it was just something I did every day […] I treated it more like I was an artist. (Participant 12)

The participant also describes the instability of early demand for sustainable projects:

> Forty years ago, there were a lot of challenges […] I might have one project a year that was well-insulated and more sustainable. Most of the projects I worked on were normal construction. (Participant 12)

These reflections highlight the marginal position of sustainable building during this early period. Limited market awareness, scarce technical knowledge, and the absence of professional networks or standardized practices meant that sustainability-focused projects were sporadic and often financially insufficient to sustain a practice. As a result, early green entrepreneurs frequently relied on conventional construction projects to maintain economic viability while gradually developing expertise and reputation in sustainable design.

In contrast to the early B2C-oriented activities described above, green entrepreneurs operating in Business-to-Business (B2B) sectors show a more pronounced emergence after 2010. This pattern coincides with the broader maturation of renewable energy and sustainable construction markets, where regulatory support, technological development, and increasing industry demand created new opportunities for firms providing specialized services, technologies, and materials to professional actors.

Participants such as P1 (solar energy software), P2 and P6 (water management systems), and P4, P5, P7, P8, and P13 (sustainable building materials) illustrate this later wave of B2B-oriented entrepreneurship. Rather than targeting individual homeowners, these ventures primarily serve developers, contractors, engineers, and other industry professionals.

Participant 1, founder of a software company supporting solar installation professionals, describes identifying a gap in the technical infrastructure of the growing solar market:

> Sizing projects like this requires complex electrical calculations […], but there were no tools available to help professionals with this task. Everyone was working with Excel files. (Participant 1, translated)

This observation led to the creation of a software-as-a-service platform designed specifically for solar installers and energy professionals. The venture therefore operates entirely within a B2B model, providing specialized tools that support the technical and operational needs of other firms within the solar industry. This case reflects a broader shift in the green economy, where entrepreneurial opportunities increasingly arise not only from delivering sustainable products directly to consumers but also from supporting the growing ecosystem of professionals and organizations involved in sustainable construction and renewable energy systems.

The temporal pattern illustrated in Figure 4.2 reveals a clear evolution in the client segments targeted by green entrepreneurs. Early activity is largely concentrated in B2C service-based ventures, where pioneers in architecture and consulting worked directly with environmentally motivated homeowners and small-scale developers. As the sustainable construction sector matured, supported by increasing environmental awareness, regulatory frameworks, and certification systems, entrepreneurial opportunities progressively expanded toward B2B markets. This shift enabled the emergence of ventures specializing in technologies, materials, and professional services designed to support developers, contractors, and other industry actors.

This evolution highlights how opportunity identification in green building entrepreneurship is shaped by broader market development. Early stages favor personalized, service-based engagement with individual clients, while later stages create opportunities for scalable B2B solutions embedded within the construction supply chain. The growing presence of B2B and hybrid business models, therefore, reflects the increasing complexity and institutionalization of the green building sector, where value creation occurs across multiple stages of the industry ecosystem.

4.1.4 Entrepreneurial Compromises in Pursuit of Sustainability

The study reveals that establishing and sustaining green businesses in the construction sector involves distinct challenges depending on the nature of the offering. Service-based firms must continuously navigate client preferences, budget constraints, and risk aversion, while product-based companies face significant barriers in securing funding that recognizes the long-term value of sustainable innovations.

In this context, service-based green building companies (e.g. sustainability consultants, green building project managers, and architects specializing in high-performance or sustainable design)

have developed what emerges from the data as a "survival mode strategy," characterized by the strategic integration of traditional building services alongside their green specializations. This hybrid approach responds to a persistent market reality key that participants consistently described: clients, whether homeowners, developers, or institutions, often resist, reject, or cannot afford comprehensive, holistic green building solutions that address all aspects of sustainability.

Participant 10, operating a service-based green building consulting and design company, articulates this strategic approach and the underlying tension it creates:

> It's essential. […] the only reason why it doesn't always get top priority is the need for survival, to be able to pay the bills and pay staff. [...] But to do that, we needed some means of acquiring more work. And what we've decided to do was to start providing all of the more conventional components of a house. (Participant 10, green service-based company).

The experience of Participant 10 exposes the fundamental economic reality facing service-based green building entrepreneurs: sustainability is essential to their identity, values, and professional mission, but it cannot always receive "top priority" when the immediate need for business survival (paying bills, meeting payroll, maintaining operations) takes precedence. During periods when work is slower and the pipeline of ideal, fully committed green building clients is insufficient to sustain the business, the company must pragmatically consider clients who only partially align with its sustainability mission.

More significantly, this strategy creates a fundamental tension: entrepreneurs must adjust their sustainability ambitions to remain viable in a market that is not yet fully receptive to holistic green building approaches. This adaptation, however, represents not an abandonment of green principles but rather a pragmatic, realistic recognition that market penetration requires initial market establishment and revenue generation through conventional service offerings that generate the reliable revenue streams necessary for business survival.

Conversely, product-based green building companies (including manufacturers of sustainable building materials and developers of green building technologies) face a distinct challenge centered on securing adequate funding for their innovations. These ventures encounter recurring fundraising difficulties that stem from a fundamental misalignment between conventional investor evaluation criteria and traditional financial metrics.

According to the entrepreneurs, investors typically prioritize conventional financial metrics such as short-term profitability, rapid revenue growth, quick return on investment, and familiar market dynamics over the long-term environmental benefits that green building products provide, forcing them to reframe their environmental mission in purely financial terms. Participant 7 highlights how this misalignment forces entrepreneurs to reframe their value proposition in purely financial terms:

> I thought that just really hammering in on the environmental and sustainable factors of this would entice people […] [but] it's about margins, it's about profitability, […] and if you can't make the other case, the sustainability stuff's just not going to work. (Participant 7)

This excerpt illustrates how fundraising success depends on aligning with conventional financial logic rather than emphasizing environmental impact. As a result, entrepreneurs are often compelled to downplay their sustainability motivations and instead foreground profitability and cost advantages in order to secure investment.

Participant 13 further emphasizes the pressure to align with investor expectations, particularly regarding return timelines:

> Investors won't want to invest because they want to see a much faster return. […] Yes, it'll be profitable, but it'll take longer, and maybe it'll be more effort, […] and so, a lot of people with good ideas […] don't make it because it's not making money fast enough for the investors. (Participant 13)

This excerpt reinforces the structural challenge faced by product-based green ventures, where long-term sustainability benefits are often undervalued in favor of short-term financial performance. As a result, entrepreneurs must shift from passion-driven environmental messaging to financially grounded arguments that align with investor priorities. This dynamic points to a broader "sustainability investment gap," in which conventional financial frameworks fail to capture the long-term value of sustainable innovations. Consequently, entrepreneurs are required to translate environmental impact into credible financial returns to secure funding and ensure venture viability.

Overall, the findings reveal two distinct forms of entrepreneurial adaptation. Service-based firms adopt a "hybrid sustainability strategy," combining green expertise with conventional services to ensure business viability in a constrained market. In contrast, product-based ventures face a "sustainability investment gap," where the long-term value of sustainable innovations is not fully

recognized by conventional financial frameworks. Together, these dynamics highlight how green entrepreneurs must continuously adapt their strategies, either by broadening their service offerings or reframing their value propositions, to navigate market constraints while pursuing sustainability goals.

4.1.5 Structural Challenges & Perceived Opportunities

Regulatory frameworks governing building design, materials, and performance standards emerged as one of the most significant structural factors shaping green building entrepreneurship. Across the interviews, participants consistently identified building codes and municipal implementation practices as critical determinants of whether sustainable innovations can be successfully introduced and scaled within the construction sector.

Firstly, participants described a complex regulatory landscape in which building codes, originally designed to ensure occupant safety and structural integrity, can unintentionally create barriers to sustainable innovation. Participant 3, who works in project management for sustainable construction projects, highlighted the challenges faced when introducing innovative building methods such as mass timber construction:

> Mass timber is a great example […] everywhere else in the world, you could build 40 stories with it. And here we're lucky if we get 14. (Participant 3)

This observation illustrates how regulatory frameworks sometimes lag behind technological developments. Despite international evidence demonstrating the safety and viability of mass timber construction, conservative building codes and cautious municipal interpretations continue to limit its widespread adoption in certain jurisdictions. As the participant notes, these constraints are largely "beyond our control," requiring entrepreneurs to navigate lengthy approval processes, extensive documentation, and alternative compliance pathways.

However, regulatory evolution can also create new challenges for industry professionals. Participant 9, an architect and green building consultant, describes the implementation of Quebec's new energy code in 2023 as an example of regulatory advancement that has outpaced industry preparedness:

> To respect it, it requires a lot of simulations […] and a lot of firms just have not been equipped to be able to do those energy simulations." (Participant 9)

While the updated code represents significant progress toward improved building performance, it also introduces new technical and operational demands. Architects and engineers must now conduct detailed energy simulations and integrate advanced performance modeling into their design processes, capabilities that many firms have not yet fully developed.

These accounts reveal a regulatory paradox within the green building sector. On one hand, outdated or restrictive codes can slow the adoption of proven sustainable technologies and protect conventional construction practices. On the other hand, rapidly evolving regulatory requirements can create implementation challenges for industry actors who lack the necessary expertise, tools, or organizational capacity. In this sense, building codes function as a double-edged sword: they can both constrain innovation when they fail to evolve and generate new opportunities when they raise performance expectations and stimulate demand for specialized expertise.

Secondly, participants also emphasized that regulatory barriers arise not only from outdated building codes themselves but from the way municipal approval processes are structured. In particular, projects using alternative or innovative construction methods often face additional administrative requirements, longer approval processes, and higher costs compared to conventional approaches. These procedural barriers can create significant financial disincentives for innovation.

Participant 13, who manufactures sustainable building materials, explains how the "alternative solutions" pathway within building codes, intended to enable flexibility and innovation, can in practice, impose substantial additional costs:

> "It's incumbent on every project owner to hire somebody and develop a project-specific report […] So, there's a cost at that front end. But that gets amplified because a lot of municipalities actually charge substantially more if you use the alternative solutions path than if you use a conventional path." (Participant 13)

This observation highlights a structural contradiction within regulatory systems. Although alternative compliance pathways are designed to allow innovative building solutions, their implementation often introduces additional engineering studies, documentation, and permit fees. As a result, innovative projects may face higher upfront costs and longer approval timelines than

conventional construction methods, effectively creating an unintended financial penalty for sustainability-oriented innovation. This finding suggests that institutional flexibility alone is insufficient to support sustainable innovation; the administrative and financial structures through which these regulations are implemented play a decisive role in shaping entrepreneurial opportunities.

Thirdly, participants also identified a pattern of selective regulatory advancement within the green building sector. While government policies and building codes have increasingly emphasized energy efficiency, other sustainability dimensions, such as water conservation, material sustainability, indoor environmental quality, and waste reduction, receive comparatively less regulatory attention and institutional support. This imbalance can influence entrepreneurial decision-making by making energy-focused innovations more attractive and viable than other sustainability solutions.

Participants 11 and 9 both highlighted how regulatory priorities shape market incentives. As Participant 11 explains:

> I would say that it's much easier to put energy into a venture that is supported by the government. So, if I'm hesitating between two paths and both have the same impact, I would definitely choose the one that the government is currently promoting. (Participant 11, translated)

Participant 9 similarly notes the increasing regulatory emphasis on energy performance:

> The building code is changing where there's more requirements now for energy efficiency, and that's fantastic. (Participant 9)

Together, these observations suggest that regulatory frameworks can indirectly steer entrepreneurial activity toward specific sustainability domains. While stronger energy efficiency requirements represent an important step toward reducing building-related emissions, the emphasis on energy performance alone may create an uneven policy landscape that offers fewer incentives and greater barriers for entrepreneurs working on other sustainability challenges.

Taken together, the interviews reveal three interconnected regulatory dynamics shaping green building entrepreneurship. First, misalignment between the pace of regulatory change and industry

readiness can create barriers to market entry and innovation. Second, alternative building methods often face higher approval costs and administrative uncertainty, discouraging experimentation and innovation. Third, the strong regulatory focus on energy efficiency, while beneficial, may unintentionally limit broader sustainability innovation. These dynamics collectively illustrate the complex regulatory environment faced by green entrepreneurs and are summarized in Figure 4.3, which maps the principal regulatory challenges and opportunity spaces within the evolving green building market. In this sense, regulatory frameworks not only constrain innovation but also shape its direction by privileging certain sustainability domains over others.

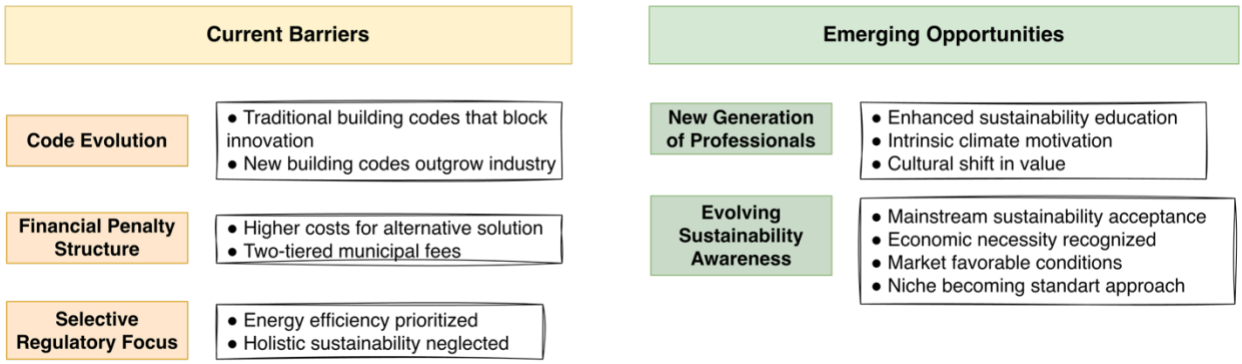

Figure 4.3 Regulatory challenges and merging opportunities in the green building market

Another significant theme emerging from the interviews concerns the transformative role of a new generation of professionals entering the engineering, architectural, and building systems sectors. According to several entrepreneurs, younger professionals bring stronger sustainability education, greater environmental awareness, and a stronger intrinsic motivation to address climate-related challenges. Entrepreneurs view this generational shift as a potential catalyst for long-term industry transformation, capable of gradually overcoming many of the regulatory and market barriers currently limiting green innovation.

Participant 9 reflects on how attitudes toward sustainability within the profession have changed over time:

> It’s like you're a wimp if you actually want to save the planet […] Today almost everyone who comes out of university has been educated in the importance of sustainability […] I have faith in the new generation. (Participant 9)

This observation highlights a significant cultural transformation within the industry. Concerns about environmental protection, once dismissed or marginalized within professional circles, are increasingly embedded in engineering and architectural education. As a result, sustainability is becoming normalized as a core professional value rather than a niche or optional specialization.

In this context, beyond professional training, participants also described a broader societal shift in public awareness and acceptance of sustainable construction practices. Entrepreneurs observed that ideas once perceived as radical or impractical are gradually becoming more widely accepted as environmental concerns gain visibility and urgency.

Participant 3 illustrates this evolution:

> If you told somebody 10 years ago, we would build something that way. They would look at you and say, you're crazy. There's no way we're never going to do that. But I think we're at a point finally where we're starting to figure out that we have this one planet. And if the future isn't about impacting it less, the future is not going to be very bright. So, I think there's a little bit of fear. (Participant 3)

Together, these perspectives suggest that cultural attitudes toward sustainability are evolving alongside technological and regulatory developments. Growing environmental awareness, combined with the emergence of a new generation of professionals trained in sustainable practices, appears to be gradually reshaping the institutional and market context in which green building entrepreneurs operate.

To conclude this theme, the intersection of generational professional change and evolving societal awareness creates a powerful convergence that entrepreneurs view as fundamentally transformative for the green building industry. According to the entrepreneurs' perspectives, the new generation of professionals not only possesses enhanced technical competencies but also operates within a cultural context where sustainability is increasingly valued by clients, investors, and regulatory bodies. This convergence suggests that the barriers currently faced by green building entrepreneurs (including regulatory resistance and market skepticism) may diminish as younger professionals assume leadership positions and sustainability awareness becomes more deeply embedded in business decision-making processes.

Moreover, the optimistic outlook expressed by entrepreneurs reflects their recognition that sustainable building practices are transitioning from being perceived as alternative or niche approaches to becoming standard professional competencies. However, as shown forward, the data also suggests that this transition remains incomplete, with economic considerations still playing a significant role in decision-making processes, indicating that while awareness has evolved, the full integration of sustainability values into market mechanisms continues to develop.

In conclusion of Theme 1, the findings highlight that green entrepreneurs identify and pursue viable market opportunities by recognizing inefficiencies and gaps in conventional construction practices, combining deep industry experience with strong environmental consciousness. Moreover, establishing and sustaining green businesses requires strategic compromises and adaptation depending on the business model. Service-based companies develop "survival mode strategies" integrating conventional services alongside green specializations to ensure economic viability, while product-based companies must reframe their environmental mission in financial terms to secure investor funding. Finally, green building entrepreneurship evolved through three distinct waves (1980-1997, 1997-2013, 2013-2025) with fundamentally different business models, market conditions, and opportunity structures. Market dynamics fundamentally shaped by temporal factors, regulatory development, and social context dictate the most effective avenues for entrepreneurial entry and growth, demonstrating that opportunity identification is not static but evolves dynamically as markets develop.

4.2 Theme 2: Impact of Stakeholders on Green Building Adoption

The second major theme emerging from the interview data centers on the critical role of various stakeholders (including clients, construction industry professionals, and investors) in either enabling or constraining the market success of green building practices and sustainable construction innovations. This theme reveals that green building entrepreneurs do not operate in isolation or simply respond to abstract market forces, but must navigate a complex ecosystem of relationships, knowledge gaps, and competing priorities among diverse stakeholder groups, each with different levels of sustainability awareness, economic constraints, and decision-making criteria. The theme encompasses four dimensions that together illuminate the stakeholder landscape: the challenge of client and professional education, the dominance of economic drivers

over environmental values in decision-making, the barriers created by high upfront costs and financial literacy gaps, and the surprising persistence of cultural prejudices against recycled and waste-derived materials.

4.2.1 Clients and Professionals Gap Education as a Marketing Challenge

According to the interviewed entrepreneurs, one of the most persistent challenges in green building entrepreneurship lies in educating clients about the technical, economic, and regulatory implications of sustainable construction. Despite growing public awareness of environmental issues and sustainability initiatives, many clients lack a clear understanding of the specific requirements, costs, and benefits associated with sustainable building practices. As a result, green entrepreneurs must not only develop technical expertise in sustainable design and construction but also acquire the ability to communicate complex sustainability concepts in ways that are understandable and meaningful to diverse stakeholders.

Participant 9 highlights how this knowledge gap often affects client expectations regarding project complexity and professional effort:

> The clients don't realise that, […] in order for your building to be conforming to the regulations in place, I need to do an extra 20 hours because it's more complicated for me. I think that there's a little bit of the public that isn't quite as educated about that or cognizant as the professionals are. (Participant 9)

This observation illustrates how sustainable construction frequently involves additional technical analysis, regulatory compliance work, and design considerations that are not immediately visible to clients. Even when clients express strong interest in environmental performance, they may underestimate the professional effort required to achieve these outcomes. Consequently, entrepreneurs must spend significant time explaining regulatory requirements, design decisions, and performance trade-offs in order to align client expectations with the realities of sustainable construction.

Participant 10 similarly describes how early clients often had only a vague understanding of what sustainable building could actually involve:

> I would say that in the earliest years, maybe the first even decade, we had to do a lot of educating where the owner knew they wanted to do something, I'll call it just better or different or greener, but they didn't know what that could look like. (Participant 10)

In such cases, entrepreneurs play an important interpretive role by translating general environmental aspirations into concrete design strategies, technologies, and material choices. This process requires entrepreneurs to guide clients through technical decisions while simultaneously demonstrating the environmental and economic value of proposed solutions.

Importantly, the educational challenge identified by participants extends beyond client relationships to the broader construction ecosystem. Entrepreneurs frequently reported the need to educate architects, engineers, builders, and installers about sustainable building systems, materials, and performance requirements. Participant 5 describes how this challenge can involve direct investments in training and capability development:

> We paid for the two-week training so that the structure engineer, the architect, our own team at our company, they could design in 3D, within just two weeks. (Participant 5)

This example highlights how sustainable projects may require new technical competencies that are not yet widespread within the industry. Consequently, green entrepreneurs often assume a coordinating role in which they facilitate knowledge transfer across the project team.

Participant 13 reinforces the extent of this challenge, particularly for emerging ventures:

> Education is one of the biggest things as a startup, especially in sustainable building space. I mean, there are people out there that do understand it and are looking for products like ours, but you still have to educate the architect, the builder, the installer. There's education ongoing; everybody needs it. (Participant 13)

Taken together, these findings suggest that green building entrepreneurs operate within a broader industry context where sustainability knowledge remains unevenly distributed across clients and professional actors. As a result, education becomes an ongoing business activity rather than a simple marketing task. Entrepreneurs must continuously invest time and resources in communication, training, and knowledge sharing, extending project timelines and increasing operational costs. In this sense, education emerges as a core function of green entrepreneurship,

shaping how sustainable innovations are understood, adopted, and implemented within the construction sector.

4.2.2 Investors' Pressure for the Financial Reframing of Sustainability

The study reveals that while green building entrepreneurs are often driven by long-term sustainable business goals and environmental values, their success depends largely on their ability to communicate value propositions in terms of immediate financial benefits and return on investment. This creates what might be termed a "values translation challenge", where entrepreneurs must systematically reframe or even suppress their core environmental mission in financial metrics and business terms to achieve market acceptance and client engagement.

Accordingly, insights from interviewed entrepreneurs suggest that marketing strategies emphasizing environmental awareness and intergenerational responsibility are viewed as impractical, ineffective, and produce limited results in actual market conditions. Conversely, marketing that highlights the measurable advantages of green building features (cost savings, faster construction, reduced maintenance, improved comfort, enhanced property value) is considered far more effective in actually closing sales and attracting investment. This strategic shift represents a fundamental adaptation to market realities rather than an abandonment of environmental values.

Several entrepreneurs explained that early attempts to emphasize environmental motivations in marketing or fundraising were often unsuccessful. Participant 5 summarizes this learning process:

> I spent three years trying to raise money on sustainability, and when we switched tactics to raising money on profitability, we got a much different result. (Participant 5)

This statement illustrates how entrepreneurs adapt their communication strategies to align with investor expectations. Rather than presenting sustainability as a primary objective, they highlight financial benefits associated with green building innovations, such as reduced operational costs, improved construction efficiency, or enhanced long-term asset value.

Participants consistently emphasized that financial considerations dominate investment decisions in the construction sector. Participant 3 describes the typical decision-making logic encountered when pitching sustainable innovations:

> At the end of the day, the only thing anybody cares about is margins. Is it going to be cost-effective? Is it going to save time, save money, or save on maintenance? Where? What's in it for me? That is 99% of things that are going to go on in this world. (Participant 3)

Similarly, Participant 13 notes that sustainability can influence decisions only when financial returns remain competitive:

> And if you can say, well, this is going to give you the same return as something else, but it's sustainable, then that sweetens the pot a little bit. But if you're like, oh, this is sustainable, you're not going to make as much money as this other investment that you're looking at, most of 'em are going to go, I just want to make money on my money. That's what my money's for, is to make money. (Participant 13)

These perspectives suggest that sustainability rarely functions as the primary driver of investment decisions. Instead, environmental benefits often serve as a secondary consideration once financial performance expectations are satisfied.

Participant 12 further highlights the practical implications of this dynamic:

> The real problem is in having to explain to clients why they should do something that would cost them more money, especially upfront, and because there's always the question of ROI, and that is actually not a thing. (Participant 12)

This observation underscores the difficulty of promoting sustainability features whose economic benefits may be long-term, indirect, or difficult to quantify within conventional investment horizons.

The extracts provided above are essential, as they illuminate investors' demand. While entrepreneurs are motivated by sustainability values, effective marketing must emphasize the practical benefits that sustainability enables rather than environmental benefits themselves. This challenges conventional assumptions about green marketing and suggests that successful green building entrepreneurs must develop sophisticated communication strategies that position sustainability as a means to achieve economic benefits rather than as an end goal.

4.2.3 Clients' Financial Constraints to Upfront Costs as Barriers to Green Building Adoption

Paradoxically, according to some entrepreneurs, the primary factor that attracts many clients to the green building market (the promise of long-term cost savings, reduced operational expenses, and improved financial performance) is costly and presents a significant barrier to many other potential clients. The study found that the high initial investment requirements for these benefits represent a primary barrier to green building adoption; however, this challenge is further compounded by clients' gaps in financial literacy, which can make it difficult to accurately assess cost-sensitive clients, budget-constrained projects, and resource-limited organizations.

Entrepreneurs emphasized that this barrier is particularly pronounced among clients who do not possess strong environmental motivations. In such cases, decision-making tends to focus primarily on immediate project costs rather than lifecycle economic performance. As a result, clients may overlook long-term savings and instead prioritize familiar and less expensive conventional construction methods.

Participant 11 illustrates this dynamic:

> That's the element that motivates many people to make ecological choices, but often it's the financial aspect that wrongly holds them back, simply because they don't have the liquidity right away, or they lack the understanding. (Participant 11)

This observation highlights two interconnected constraints affecting green building adoption. First, some clients simply lack the immediate financial liquidity required to cover higher upfront investments. Second, others struggle to fully understand or evaluate the long-term financial benefits associated with sustainable construction. Together, these factors limit clients' ability to assess lifecycle cost advantages and increase perceived financial risk.

Participant 9 further describes how this uncertainty influences investment decisions:

> Once they understand that they have to give something up because they can't afford these upfront costs, they can't see into the future, real estate is designed to be an investment. (Participant 9)

This perspective reflects the central role of investment logic in construction decisions. Because real estate projects are primarily evaluated based on financial performance, clients often prioritize short-term affordability over long-term efficiency gains when future benefits are uncertain or difficult to quantify.

In conclusion, the data reveal that while consumers are able to express general interest in green building features, they are often discouraged from implementing them by high initial costs and a lack of detailed understanding of the specific factors, technical requirements, performance characteristics, and cost-benefit relationships of green building. This knowledge gap can make the investment appear less appealing, riskier, or economically unjustifiable to resource-constrained clients who cannot afford to make investment mistakes or absorb cost overruns.

4.2.4 Customers' Prejudice Regarding Waste Material

From the narrative of specific green entrepreneurs, a significant finding emerged regarding persistent customers' prejudices and negative perceptions against building materials derived from waste streams and recycled sources. Entrepreneurs associated with product-based ventures manufacturing building materials from recycled content or waste streams noted that these prejudices persist stubbornly even when recycled materials offer demonstrably superior performance characteristics, faster installation times, lower costs, or other tangible advantages, suggesting that material perception barriers operate separately from rational economic considerations or objective performance evaluations.

Consequently, entrepreneurs working with recycled materials, waste-derived products, or circular economy approaches must develop value translation and sophisticated market segmentation strategies, carefully identifying customers who are receptive to sustainable material messaging while simultaneously translating environmental worth with clients who view recycled content negatively. This highlights that the green building market may be more fragmented than previously understood, with distinct end-users' segments, different market niches requiring fundamentally different, sometimes contradictory communication approaches, value propositions, and positioning strategies.

Participant 8 illustrates how these perceptions influence customer reactions when presenting products manufactured from recycled materials:

> First, I should mention the price and how easy they can use that themselves. So, they don't think that these are garbage things because they are from waste material. I should take care of that part too, because easily they think that they are garbage. (Participant 8)

This comment highlights how recycled materials can trigger negative psychological associations. Some customers interpret the use of waste-derived materials as equivalent to purchasing low-value or undesirable products, leading entrepreneurs to emphasize other product attributes such as affordability, usability, or performance before introducing the sustainability aspect.

Entrepreneurs, therefore, adapt their communication strategies depending on the audience. Participant 9 explains that sustainability messaging can sometimes be counterproductive for certain client segments:

> Depending on the customer, some customers, we actually won't even talk about the environmental or recycled content side of things at all. Not at all, because for some customers, it's actually overly idealistic. (Participant 9)

In these cases, entrepreneurs deliberately avoid emphasizing environmental attributes in order to prevent negative reactions associated with recycled materials. Instead, they focus on practical benefits such as cost efficiency, functionality, or ease of implementation.

These accounts suggest that the market for recycled construction materials is more fragmented than often assumed. Different customer segments respond differently to sustainability messaging, requiring entrepreneurs to tailor their communication strategies accordingly. For some clients, environmental benefits represent a strong selling point; for others, emphasizing sustainability may reduce perceived product value.

Consequently, entrepreneurs working with recycled materials must navigate not only technical and economic challenges but also cultural perceptions surrounding waste and recycling. Overcoming these stigmas requires carefully translating the value of circular materials into terms that resonate with different customer groups.

In conclusion of Theme 2, the findings highlight that persistent gaps exist in client and professional understanding of sustainability benefits, performance characteristics, and cost implications, creating educational burdens and cost disadvantages that distinguish green ventures from

conventional construction businesses and require substantial investment in communication and capability development. Moreover, market success for green building entrepreneurs depends fundamentally on reframing environmental values in financial metrics and business terms that resonate with investors and clients. Decision-making is overwhelmingly driven by economic self-interest and return on investment rather than environmental altruism, forcing entrepreneurs to position sustainability as a means to achieve financial benefits rather than as an end goal, creating a "values translation challenge" central to market acceptance. Finally, multiple interconnected barriers constrain green building adoption: high upfront costs combined with clients' financial literacy gaps, persistent cultural prejudices against recycled and waste-derived materials, and fragmented market segments requiring fundamentally different communication strategies. These barriers operate separately from rational economic considerations, requiring entrepreneurs to develop sophisticated market niche targeting and value translation strategies tailored to distinct customer segments with different perceptions and priorities.

4.3 Theme 3: Market & Innovation Dynamics

The third major theme emerging from the interview data centers on the multifaceted relationship between market dynamics, competitive forces, regulatory frameworks, and environmental policy in shaping the opportunities and strategic choices facing green building entrepreneurs. This theme reveals that green entrepreneurs operate within a market environment characterized by fundamental tensions, contradictions, and paradoxes: sustainability can serve as both a powerful competitive differentiator and a market limitation; and market competition involves both conventional industry giants and superficial greenwashing practices that undermine authentic sustainability efforts. The theme encompasses six dimensions that together illuminate the market and policy landscape: sustainability as a business differentiator, competitive pressures from established industry players, the proliferation of greenwashing and "low-hanging fruit" practices, structural barriers to market entry including geographical constraints, the critical role of networking and collaboration, the impact of support ecosystems including government programs, and the complex relationship between innovation and regulatory frameworks.

4.3.1 Sustainability as Advantage and Barrier

Entrepreneurs in this study who deliberately positioned their ventures as sustainability-focused enterprises rather than conventional contractors offering occasional green services reported that this differentiation strategy creates significant competitive advantages in an increasingly environmentally conscious marketplace. This differentiation strategy operates fundamentally through scarcity value, where the limited number of providers offering authentic, sustainable building solutions with genuine expertise creates a unique market position that attracts environmentally motivated clients who cannot find equivalent services from conventional contractors.

Participants explained that sustainability positioning serves simultaneously as both a filtering mechanism and a client acquisition tool. A marketing advantage that generates inbound inquiries, referrals, and reputation-based business development, allowing green building entrepreneurs to access niche markets, specialized segments with reduced competition, and higher client commitment.

Participant 10 illustrates how this dynamic operates in practice:

> We have a natural building side […]straw bale building, rammed earth, cob, […] if anybody, if any consumer has that interest, they all ultimately find us because there are reasonably few providers. (Participant 10)

This observation highlights how specialization in alternative building methods creates a concentration effect. Because relatively few companies offer these services, clients seeking such solutions often converge on the limited number of available providers.

Participant 11 similarly emphasizes the reduced competitive pressure associated with operating in a sustainability niche:

> Instead of competing with 10 other contractors, sometimes we find ourselves with no competition at all, or with just one competitor. [...] The advantage is that there’s less competition in that market. (Participant 11, translated)

While operating within a niche market can limit the overall size of the potential client base, it can also reduce direct competition and strengthen a firm's market positioning. Entrepreneurs therefore

benefit from a distinctive reputation that generates referrals, repeat clients, and reputation-based project acquisition.

However, the findings also reveal an important paradox in sustainability-oriented positioning. Although environmental differentiation can attract committed clients and create competitive advantages, it can simultaneously limit appeal to broader market segments. Some entrepreneurs noted that emphasizing environmental messaging too strongly may discourage potential clients who prioritize cost considerations or who perceive sustainability as impractical or overly idealistic.

As illustrated in Figure 4.4, sustainability therefore operates as both an advantage and a barrier in market positioning. On the one hand, it enables entrepreneurs to differentiate themselves and attract environmentally motivated clients. On the other hand, it may reduce resonance with more price-sensitive or conventionally oriented customers. Therefore, successful entrepreneurs must learn to balance sustainability messaging with practical and economic value propositions in order to reach a wider range of clients.

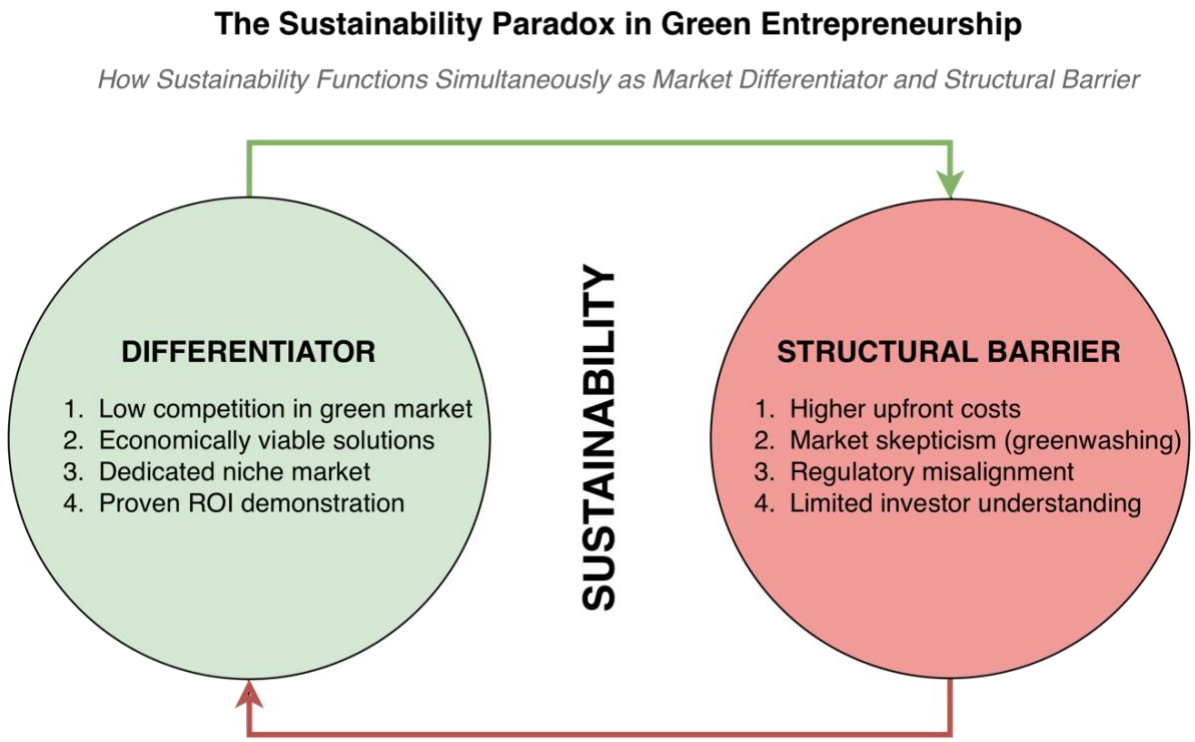

Figure 4.4 The sustainability paradox in green entrepreneurship

Figure 4.4 synthesizes the dual role of sustainability identified in the interviews. Rather than representing a purely advantageous positioning strategy, sustainability creates a strategic tension for entrepreneurs. While environmental positioning enables firms to differentiate themselves and attract environmentally motivated clients, it also exposes them to structural constraints such as higher project costs, skepticism toward sustainability claims, and limited investor understanding. As a result, entrepreneurs must actively navigate this tension by adapting their market positioning and communication strategies. The empirical evidence suggests that successful green ventures do not rely solely on environmental messaging; instead, they develop hybrid strategies that combine sustainability commitments with economic, technological, or innovation-oriented value propositions.

To navigate this paradox, entrepreneurs develop a set of strategic responses that allow them to balance sustainability commitments with market realities. Figure 4.5 maps these responses across the interviewed participants, identifying four recurring strategic approaches observed in the data.

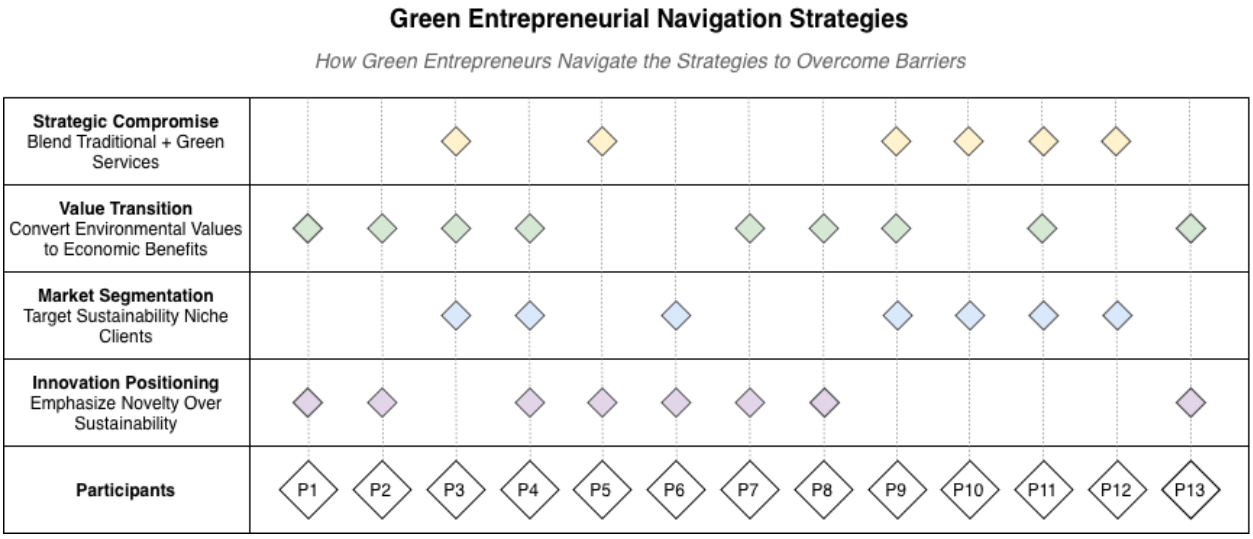

Figure 4.5 Green Entrepreneurial Navigation Strategies

First, strategic compromise involves blending conventional construction services with sustainability-oriented practices. This strategy allows entrepreneurs to maintain financial stability by accepting projects that include both traditional and green elements, thereby reducing the economic risks associated with operating exclusively within niche sustainability markets.

Second, value translation refers to the process of reframing environmental benefits in economic terms that resonate with investors and clients. Entrepreneurs employing this strategy emphasize measurable financial outcomes, such as energy savings, reduced maintenance costs, or improved property value, in order to align sustainability initiatives with conventional investment criteria.

Third, market segmentation involves deliberately targeting client groups that are already receptive to sustainability-oriented solutions. By focusing on environmentally motivated customers, entrepreneurs can reduce resistance to green building practices and operate within market segments where sustainability is perceived as a value rather than a cost.

Finally, innovation positioning highlights the technological novelty and performance advantages of green solutions rather than emphasizing sustainability alone. Entrepreneurs adopting this strategy present their products or services as innovative construction technologies, thereby appealing to clients interested in efficiency, performance, or modern building methods.

The distribution of participant codes in Figure 4.5 demonstrates that these strategies are not mutually exclusive. Many entrepreneurs combine multiple approaches simultaneously, adapting their positioning depending on the project, client type, or market conditions.

Despite these adaptive strategies, as explained forward, participants emphasized that competition between sustainability-focused ventures and conventional construction firms remains a persistent challenge. Smaller green enterprises often face structural disadvantages, including higher upfront project costs, limited economies of scale, reliance on specialized materials, and the additional learning curves associated with emerging technologies. In contrast, large established construction firms benefit from extensive operational experience, optimized processes, and greater access to financial resources, allowing them to reduce project costs and maintain competitive pricing.

Nevertheless, the findings suggest that this competitive imbalance does not necessarily eliminate opportunities for green entrepreneurs. By leveraging specialized expertise, technological innovation, and access to environmentally motivated client segments, sustainability-oriented ventures can maintain viable market positions despite operating within a more constrained competitive landscape. Their ability to differentiate through knowledge, niche positioning, and innovative building solutions enables them to compete effectively within segments of the construction market where environmental performance is increasingly valued.

4.3.2 Competitive Pressures in the Green Market

The interviews reveal a significant competitive asymmetry between small sustainability-oriented ventures and large, established firms in the construction industry. Green entrepreneurs frequently operate as specialized companies with limited resources, while competing against incumbent firms that benefit from decades of market presence, established supply chains, and significant economies of scale. This structural imbalance creates a challenging competitive environment in which sustainable ventures must justify higher upfront project costs while competing against conventional providers that prioritize cost efficiency and standardized construction practices.

Participants emphasized that large construction companies often possess strong advantages in terms of production capacity, purchasing power, and brand recognition. These incumbents can optimize project costs through established processes and supply chains, enabling them to offer lower prices that appeal to cost-sensitive clients. As a result, green entrepreneurs frequently face pressure to demonstrate the economic viability of their solutions while competing against firms whose competitive advantage lies primarily in scale rather than innovation.

Participant 8 illustrates this competitive dynamic:

> My competitors are huge. […] Those guys who have been producing bricks in Ontario for more than a hundred years […] they don't have innovation, they're just huge. So I try to compete with them with innovation. (Participant 8)

This statement highlights how the entrepreneur attempts to offset structural disadvantages by emphasizing innovation and technological differentiation. Rather than competing directly on price, green ventures position themselves through new materials, novel construction techniques, and improved environmental performance.

Participant 5 further describes how this competition unfolds during project evaluation:

> At first, you need to compete with the status quo being falsely cheaper […] and then if you have done that, what kind of opportunities do you have in regard of sustainability? (Participant 5)

This observation suggests that entrepreneurs must first overcome the perception that conventional construction methods are inherently cheaper. Only after addressing this initial cost comparison can

they highlight the broader benefits associated with sustainable solutions, such as improved environmental performance or long-term operational savings.

Taken together, these findings indicate that green entrepreneurs operate within a competitive environment where price-based competition favors established incumbents. Consequently, sustainable ventures rely on alternative forms of differentiation, particularly innovation, specialized expertise, and environmental performance, to compete effectively. By emphasizing these attributes, entrepreneurs attempt to shift client decision-making away from purely short-term cost considerations toward broader evaluations of long-term value and sustainability outcomes.

4.3.3 The "Low-hanging Fruit" Approach

According to the participants, sustainability presents a double-edged opportunity in the green building market, where environmental benefits can be leveraged by any market participant, regardless of their genuine commitment to sustainable practices. This accessibility creates significant challenges for dedicated green entrepreneurs as traditional companies increasingly incorporate selective green services into their offerings, effectively diluting the specialized market positioning that green entrepreneurs have worked to establish. The phenomenon, characterized by participants as "low-hanging fruit" practices, represents a strategic approach where conventional companies adopt minimal sustainability measures to capture green market segments while maintaining their profit-maximizing operational models.

The data reveals that, according to the entrepreneurs, profit-driven traditional companies strategically exploit sustainability incentives and market demand for green services, creating unfair competition for entrepreneurs who have built their entire business model around comprehensive sustainable practices. This exploitation undermines the market differentiation that authentic green entrepreneurs rely upon while potentially misleading consumers about the true environmental impact of building projects.

Participant 3 refers to these practices as “low-hanging fruit,” describing how companies prioritize sustainability measures that are easy to implement or beneficial for marketing purposes rather than those with the greatest environmental impact:

> It’s the low-hanging fruit. […] It's easy to do, but it doesn't make a huge impact. Everybody goes for the most points first and then finds out they really didn't say a lot in terms of environmental impact. (Participant 3)

This strategy allows companies to position themselves as environmentally responsible without fundamentally transforming their operational models. Entrepreneurs perceive that sustainability claims can be used strategically as a marketing tool, creating competition from firms whose engagement with sustainability remains limited.

Participant 12 highlights the economic logic behind this behavior:

> They're looking at how they can get a building out and make the most money that they possibly can. […] They're always going to be looking at the bottom line. (Participant 12)

From the perspective of green entrepreneurs, such profit-driven approaches often prioritize minimum regulatory compliance rather than meaningful environmental improvement. As a result, sustainability practices may be implemented only when they do not threaten cost efficiency or profit margins.

In the same context, for some entrepreneurs, a significant concern is the issue of greenwashing practices, where traditional companies make environmental commitments that fail to align with their actual service delivery, expertise levels, or quality standards. This misalignment creates market confusion and undermines the credibility of authentic green building practices, as consumers struggle to distinguish between genuine sustainable offerings and superficial green marketing.

Participant 12 highlights the challenge of competitors’ approaches:

> There are some builders out there, […] the vast majority of them are interested in meeting code at the lowest level they possibly can. That's a challenge. […] They're also buying their greenwashed products, which causes more problems than not using it. (Participant 12)

By focusing primarily on meeting minimum regulatory requirements, builders may adopt “green” products as symbolic indicators of sustainability rather than as components of a coherent environmental strategy. This approach can lead to unintended consequences, where inappropriate

sustainability measures create operational or environmental problems that would not arise under conventional construction methods.

Participant 9 illustrates the perception that false environmental claims are used in marketing despite limited alignment with actual construction practices:

> You see these condos, green condos, and you question what actually makes them green? There's nothing green about your Condo. (Participant 9)

These observations suggest that the widespread use of misleading sustainability in the construction industry can create confusion among clients regarding what constitutes genuine environmental performance. When sustainability claims are used inconsistently or superficially, it becomes more difficult for clients to distinguish between authentic sustainability-oriented firms and companies employing sustainability primarily as a marketing narrative.

Consequently, the widespread adoption of low-hanging fruit practices and greenwashing creates complex competitive dynamics and market distortions that challenge the market positioning of authentic green building entrepreneurs. While these practices may increase overall awareness of sustainability concepts, they simultaneously dilute the value proposition of comprehensive green building expertise and create market skepticism about what constitutes genuine environmental performance. This market distortion forces dedicated green entrepreneurs to invest additional resources in education and differentiation, as well as in market positioning to distinguish their authentic practices from superficial green marketing.

4.3.4 Geographical Limits and Networking: Structural Barriers to Market Entry

The study finds that geographical factors (spatial distribution of clients and projects) pose structural challenges for green building entrepreneurs, affecting not only market access but also broader aspects of their operations, including project delivery, team management, and business viability. This challenge is especially sharp for green building entrepreneurs because sustainability-oriented services often target specialized or niche markets, demand tends to be geographically dispersed rather than concentrated within a single region. As a result, green entrepreneurs frequently operate

across larger territorial areas than conventional construction firms, which can rely on more consistent local demand.

Participant 10 describes how the niche nature of alternative construction methods reduces the likelihood of geographically concentrated projects:

> When you're doing something alternative, it means that there's a low likelihood of a geographical concentration of work. […] Ultimately, in order to provide a career opportunity for our staff and not just a job where they would only potentially stay for a few years, we needed to be able to start to reduce our geographical coverage. (Participant 10)

This observation highlights a key structural tension faced by green entrepreneurs. While specialized expertise creates differentiation in the market, it simultaneously limits the density of potential clients within a given location. As a result, companies face two options: expand their geographical reach to secure enough project volume, or, like the entrepreneur, reduce it to maintain operational viability.

Participant 11 provides a concrete example of this dispersion:

> There was indeed a market, but not yet dense enough to work locally in my area. […] 60% of my contracts were in Estrie, in the Eastern Townships, and 30% were in the Laurentians, which forced me to travel and structure a company with mobile teams (Participant 11, translated)

In this case, the majority of projects were located outside the entrepreneur's home region, requiring the organization of mobile work teams and additional logistical arrangements such as travel and lodging. These conditions increase operational complexity and project costs compared with firms operating within geographically concentrated markets.

For a better understanding, the geographic distribution of the companies included in this study is a key variable, acknowledging that regional differences in government incentives, regulatory frameworks, and building standards can impact business operations and development trajectories. Figure 4.6 presents the geographic distribution of the selected entrepreneurs' companies by province or country. A significant concentration of companies (50%) is observed in the province of Quebec (n=6). The remaining Canadian companies are distributed among Ontario (n=2), British

Columbia (n=2), Alberta (n=1), and New Brunswick (n=1). Additionally, one company included in the analysis is headquartered in the Netherlands, which was selected for its established business presence in the Canadian market.

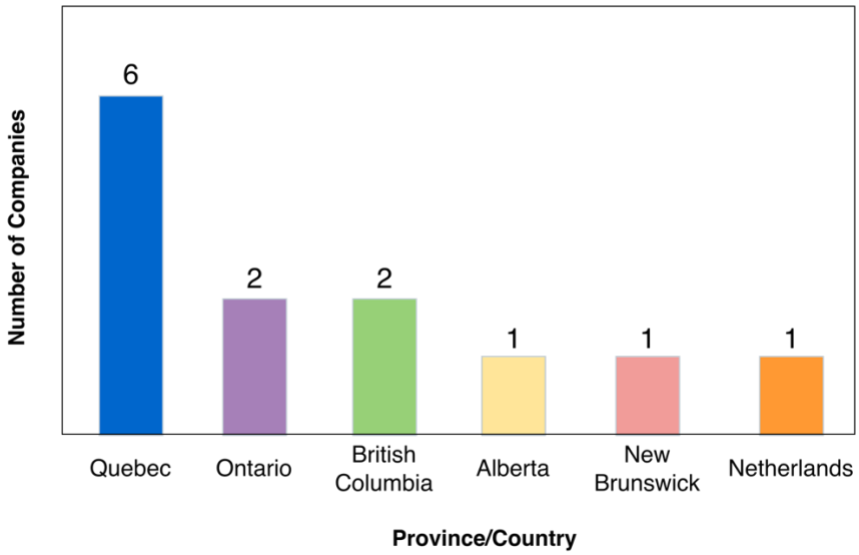

Figure 4.6 Geographical distribution of interviewed entrepreneurs' companies

Beyond geographical dispersion, participants also identified networking and industry collaboration as critical factors influencing the viability of green building ventures. Unlike conventional construction projects that rely on well-established supply chains and standardized practices, sustainable building initiatives often require specialized materials, alternative construction techniques, and professionals with specific technical expertise. Consequently, entrepreneurs must develop extensive professional networks in order to coordinate projects and access the necessary knowledge and resources.

Participant 5 highlights the inherent complexity of the construction sector:

> Construction is pretty fragmented […] You have a client, a construction engineer, a general contractor, a lot of subcontractors, the location, neighbours, municipalities […] it's just increasing complexity. (Participant 5)

This fragmentation increases coordination challenges, particularly for sustainability-oriented projects that introduce new technologies or unconventional building methods, requiring specialization among the professionals and increased bureaucracy in construction implementation.

Participant 12 similarly emphasizes the lack of communication across industry actors:

> It's an industry that is severely siloed, […] the communication is lost. (Participant 12)

According to the participant, effective collaboration requires proactive communication and knowledge sharing among professionals involved in the project. Entrepreneurs often take on the role of facilitators, encouraging collaboration among engineers, contractors, and suppliers in order to solve technical challenges associated with sustainable construction.

The entrepreneurs' testimonies reiterate the critical importance of cultivating industry networks that facilitate knowledge sharing, problem-solving, collaboration, and resource access. Taken together, these findings suggest that successful green building entrepreneurs must navigate both spatial and relational challenges. The dispersed geography of demand requires companies to operate across wider territories, while the fragmented structure of the construction industry necessitates strong professional networks capable of supporting complex, collaborative projects.

4.3.5 Industry Programs: The Importance of the Support Ecosystem

The interviews highlight the important role that entrepreneurial support ecosystems play in the development of green building ventures. Participants reported that access to incubators, accelerators, government programs, and business development initiatives can provide essential resources for early-stage entrepreneurs, including access to funding opportunities, technological capabilities, training programs, and professional mentorship. For many entrepreneurs, the support system is a crucial asset for survival in the green market; others have even reported the necessity of aligning with and selecting entrepreneurial support programs that share their environmental values.

Participant 13 describes how accelerator programs provided access to technological resources and institutional support that would otherwise have been difficult to obtain independently:

> I mean, there are accelerated programmes and other programmes that they're doing stuff like contact and these sorts of things, which is like 3D modelling or drone footage or this kind of technology kind of stuff. [...] We've continued to get support from accelerators and organisations that recognise that we need to do more of this kind of thing (Participant 13)

Beyond technological assistance, participants also emphasized the importance of values alignment when selecting entrepreneurial support programs. Participant 1 explains how their company deliberately chose an incubator that shared its environmental values:

> We chose *Défi Montréal*[4] because, in terms of values, we shared the same principles. We could have gone to other incubators; we even tried others, like the *Centech*[5], which is a very technical incubator, but we didn't really like their approach. It was very business, business, business, business, and that just didn't feel right to us. So, we decided to go with an incubator that better aligned with our values. (Participant 1, translated)

This observation suggests that green entrepreneurs may prioritize support environments that recognize both the economic and environmental dimensions of their ventures, rather than programs that focus exclusively on financial performance.

Moreover, participants also highlighted that government support emerges as the most impactful form of assistance for scaling green building ventures, with participants identifying several specific mechanisms that proved transformational for their businesses. According to the participants, the data reveal three primary categories of government support that participants found most valuable: research and development funding, hiring and training incentives, and mentoring programs specifically designed for green businesses.

Participant 5 describes how early-stage financial assistance enabled the development of their venture:

> When I first started the business, I got into the self-employment benefit programme. There's a lot of R&D funding that's gotten us here. Without that, it wouldn't have happened. (Participant 5)

Similarly, Participant 10 explains how hiring incentives allowed the company to expand its workforce and pursue new projects:

> The one thing we did access about five or six years ago that was somewhat transformational in terms of the size of our company was access to significant hiring and training incentives

[4] Business accelerator and support program for innovative companies with high growth.
[5] Non-profit incubator dedicated to high-tech companies (deeptech).

> for new permanent hires that took the cost of training and allowed us to recoup it effectively through these incentives. It entirely incentivized us to hire people we wouldn't have hired out of ordinary cash flow. Otherwise, I wouldn't have taken the risk of hiring as many people as we did over a period of time because the training cost is high and the potential of being able to utilise them is uncertain initially. (Participant 10)

These programs reduced the financial risks associated with hiring and training employees, enabling companies to expand their operational capacity and pursue additional projects.

Research and development funding appeared particularly critical for product-based green building companies, with several participants noting that their innovations would not have been possible without sustained R&D support. This finding suggests that the technical innovation required for green building solutions often exceeds the financial capacity of early-stage entrepreneurs, making government R&D funding essential for bringing sustainable building technologies to market. Hiring and training incentives emerged as particularly transformational for service-based companies, with one participant describing how federal hiring incentives enabled them to expand their workforce beyond what their cash flow would normally support, creating a positive growth cycle that sustained long-term expansion. Mentoring programs specifically targeted at green businesses provided another crucial form of support, offering entrepreneurs access to industry-specific guidance that addressed both business development and sustainability implementation challenges.

Despite the availability of various support initiatives, the study uncovered significant barriers that prevent entrepreneurs from fully accessing available resources. Several entrepreneurs revealed a complex landscape where support exists but remains difficult to navigate, with entrepreneurs struggling to identify which programs are relevant to their specific needs and stage of development. This information gap appears to be particularly challenging for entrepreneurs from diverse backgrounds or those without extensive business networks.

Furthermore, the research also identified systemic limitations in the support ecosystem, particularly regarding programs designed to help companies scale beyond early-stage development. Several participants noted that while Canada offers substantial early-stage support, the infrastructure for scaling green building innovations to market impact remains inadequate, forcing some

entrepreneurs to consider relocating to access growth capital and market opportunities. When asked whether there is sufficient support for green entrepreneurship, most respondents answered differently, depending on the aspect, suggesting it is specific to each stage, company, and sector. Participant 8 illustrates this challenge:

> I knew that government support existed, but I didn't know which program was relevant for me, where to find it, or how I could get those funds. (Participant 8)

Participants also identified a structural gap in support for scaling green building innovations beyond early-stage development. While early-stage programs are relatively common, support mechanisms for bringing sustainable technologies to market on a larger scale remain limited.

> There is support in some areas, but the support that's needed to bring real solutions to market at scale doesn't exist. It does not exist. The SDTC[6] was one that did, and they shut that down because of one or two bad apples. (Participant 7)

Participant 8 reveals the information gap challenge: awareness that "there exists the government support" but inability to navigate "which part I should go and find, which part is related to me," suggesting that program complexity and lack of clear guidance prevent access. While Participant 7 identifies a critical gap: while "there is support in some areas," the "support that's needed to bring real solutions to market at scale doesn't exist," and the cancellation of SDTC (Sustainable Development Technology Canada) eliminated one of the few programs that did provide scaling support.

Finally, perhaps the most important insight regarding support systems was the overwhelming importance of networking as the primary mechanism for accessing information. The study found that formal support programs, while valuable, were often discovered and accessed through informal networks, rather than through official channels. This indicates that the effectiveness of support ecosystems may depend as much on the social capital as on the formal availability and accessibility of resources.

Participants consistently emphasized that building relationships with other entrepreneurs, industry professionals, and experts provided more valuable and actionable information than formal

[6] Sustainable Development Technology Canada was a tech fund created by the Government of Canada to fund new clean technologies.

information sources. This networking approach appeared to serve multiple functions: providing access to practical knowledge, creating opportunities for collaboration, and offering ongoing mentorship relationships that evolved with the entrepreneur's changing needs. In this matter,

Participant 10 emphasizes the importance of surrounding oneself with knowledgeable collaborators:

> In order to really make it the business viable, what I immediately did upon understanding the basics was to hire and surround myself with people who knew more than me, which still at that point, was virtually anyone. (Participant 10)

Similarly, Participant 11 describes how participation in professional associations enabled broader industry learning and collaboration:

> Through the CHQ, in 2012, we created the Sustainable Development Committee, which still exists today. That allowed me to interact with people from different sectors and perspectives related to the building industry, and to gain a more global understanding of the reality, to see what the real issues are. (Participant 11)

Participant 3 also highlights the role of industry events and networking opportunities as platforms for knowledge exchange:

> If you're talking to somebody who it's their business every day to continue to push the edge of the envelope and what they produce, that's going to probably be your best information. It is part of building their network. It's like a gift with purchase. You buy a ticket to a panel discussion for very little money, and you get access to a lot of resources. I mean, nobody starts out being a sustainability expert. They may start out being a huge supporter of sustainability as they understand it, but they don't have the depth of knowledge yet to be able to put it into words as to how they're going to do it. (Participant 3)

In conclusion, these findings indicate that the effectiveness of entrepreneurial support ecosystems depends not only on the availability of formal programs but also on the social networks through which entrepreneurs' access and mobilize these resources. This approach appears to be especially critical in the green building sector, where rapid technological change, fast-paced innovation, and evolving regulatory environments require ongoing education and adaptation.

4.3.6 Green Building Innovation Versus Building Standards

The findings reveal a persistent tension between green building innovation and existing regulatory frameworks. Entrepreneurs reported that sustainable construction technologies often emerge faster than the regulatory systems designed to govern them. As a result, innovators frequently face the challenge of introducing new solutions in the absence of clear regulatory guidance. This situation creates what can be described as a "regulatory catch-22", where innovative building solutions must demonstrate their effectiveness through real-world implementation before formal standards can be developed, yet the absence of these standards makes initial implementation more difficult.

The research uncovered, from entrepreneurs' perspectives, that this regulatory gap places green building entrepreneurs in the uncomfortable position of being pioneers in uncharted regulatory territory. Introducing new materials, technologies, or construction techniques requires entrepreneurs to anticipate future compliance requirements without clear guidance from existing building codes. This uncertainty can increase financial and operational risks, particularly when entrepreneurs must convince investors, insurers, or regulators of the safety and feasibility of their innovations.

Participant 8 reflects this concern when discussing the introduction of a new building product:

> My product is something new, and I should be regulated […], but for sure, that wouldn't be easy. (Participant 8)

This statement illustrates the ambiguity surrounding regulatory approval for innovative building technologies. While the participant recognizes the importance of regulatory oversight, the absence of established frameworks creates uncertainty about how such innovations will eventually be evaluated or approved.

Participants also highlighted the first-mover disadvantage associated with introducing novel sustainable construction practices. As Participant 3 explains:

> No one likes to be first. No one wants to be the Guinea pig. So again, we rely a lot on previous research. I think that the biggest challenge with anything that's new or anything that's a challenge to the status quo is just that it's finding the case studies that could prove that at least have a good likelihood of working. (Participant 3)

This comment captures the reluctance of clients and industry stakeholders to adopt untested building methods. In a sector where reliability and safety are paramount, decision-makers often prefer established construction techniques with proven performance records. As a result, entrepreneurs must overcome skepticism toward unfamiliar technologies before their innovations can gain broader market acceptance. To manage this uncertainty, participants reported relying heavily on existing research, pilot projects, and demonstration cases to support the credibility of their innovations.

Such examples provide critical validation that can help entrepreneurs demonstrate the feasibility of new construction methods to regulators, investors, and clients. In practice, these case studies function as informal mechanisms for reducing perceived risk and building confidence in emerging technologies. This reliance on precedent highlights a broader challenge within the green building sector. Because many sustainable construction technologies are relatively new, traditional regulatory frameworks may not yet include appropriate evaluation criteria. Entrepreneurs must therefore build their own evidence base to demonstrate safety, performance, and compliance with broader regulatory principles, even when specific standards for their innovations have not yet been established.

Moreover, as discussed earlier, existing building codes can create additional obstacles for innovative sustainable solutions. Although alternative compliance pathways theoretically allow new technologies to be implemented, participants reported that these processes often involve additional documentation, higher costs, and longer approval timelines. Consequently, regulatory mechanisms intended to facilitate innovation may inadvertently increase the complexity and financial burden associated with adopting sustainable building practices.

Overall, the findings of Theme 3 demonstrate that sustainability functions simultaneously as both a competitive advantage and a structural constraint for green building entrepreneurs. While environmental positioning allows firms to differentiate themselves in niche markets and attract environmentally motivated clients, it also exposes them to multiple structural challenges. Entrepreneurs must compete against established construction companies with significant economies of scale, navigate market skepticism fueled by widespread greenwashing practices, and operate within geographically dispersed niche markets that require extensive networking and collaboration.

At the same time, the support ecosystem surrounding green entrepreneurship presents both opportunities and limitations. Although public funding programs, incubators, and accelerators provide valuable early-stage assistance through research and development funding, hiring incentives, and mentoring initiatives, entrepreneurs reported that access to these resources often depends on informal networks and social capital. Furthermore, the infrastructure necessary to scale green building innovations beyond early development stages remains limited.

Finally, the relationship between innovation and regulation introduces an additional layer of complexity. Green entrepreneurs frequently operate ahead of existing regulatory frameworks, forcing them to manage uncertainty regarding approval processes, performance validation, and market acceptance. As a result, successful green building ventures must simultaneously navigate competitive pressures, institutional constraints, and evolving regulatory environments while continuing to demonstrate the economic and environmental value of sustainable construction practices.

CHAPTER 5 DISCUSSION

While Chapter 4 presented the empirical findings derived from the interviews, this chapter interprets these findings in light of the theoretical framework introduced in Chapter 2. By mobilizing key concepts from the literature on green entrepreneurship, sustainable business models, and sustainability transitions, the discussion aims to situate the empirical observations within broader theoretical debates and clarify the contribution of this research.

Theme 1 explores the green entrepreneurial journey, revealing that while the findings highlight the practical trajectories of entrepreneurs entering the green building sector, they also reflect broader theoretical discussions on sustainable entrepreneurship. Previous research emphasizes that green entrepreneurs operate within a dual logic, simultaneously pursuing environmental objectives and economic viability (Schaltegger & Wagner, 2011). The experiences described by participants illustrate how this dual orientation shapes opportunity recognition and venture creation in the construction sector. Rather than emerging solely from environmental idealism, entrepreneurial initiatives are rooted in professional expertise and industry experience, reinforcing the opportunity-recognition perspective in entrepreneurship literature (Shane & Delmar, 2004). In this sense, the entrepreneurial journeys observed in this study illustrate how sustainability-driven opportunities are embedded in sector-specific knowledge and practical experience rather than abstract environmental motivations.

The analysis of participant market entry reveals distinct temporal patterns that correspond to broader phases in the evolution of green entrepreneurship within the construction sector. The findings suggest that entrepreneurial entry is strongly influenced by the institutional and technological context in which ventures emerge, as further presented in Table 5.1. Wave 1 pioneers (1980–1997) entered niche markets largely motivated by environmental values, operating in a context characterized by limited institutional support, weak market demand, and the absence of standardized sustainability frameworks (Häkkinen & Belloni, 2011). These early entrants functioned as institutional pioneers, experimenting with alternative construction approaches in an environment of high uncertainty.

In contrast, Wave 2 entrepreneurs (1997–2013) entered the market during a period of increasing institutionalization of sustainable construction practices. The introduction of certification systems

such as LEED and the expansion of environmental policies contributed to the professionalization of the sector, creating more predictable market opportunities and reducing some of the risks associated with green ventures (UNEP, 2021).

Finally, Wave 3 entrants (2013–2025) operate within a markedly different landscape characterized by intensified climate policy debates, increased corporate sustainability commitments, and the growing use of data-driven tools such as whole-life carbon assessment. In this context, sustainability is no longer confined to niche markets but increasingly integrated into mainstream construction practices.

Taken together, these temporal patterns highlight how the entrepreneurial process in the green building sector is not solely driven by individual opportunity recognition but is deeply shaped by evolving institutional conditions, technological developments, and policy frameworks. Understanding these waves provides critical context for interpreting how entrepreneurs navigate market opportunities and constraints depending on when they enter the green building ecosystem. This finding reinforces the view that entrepreneurial opportunities are not static but emerge from evolving institutional environments that shape both the availability and legitimacy of sustainable business practices.

Table 5.1 Characteristics of market entry waves

Dimension	Wave 1: Pioneers (1980-1997)	Wave 2: Professionalization (1997-2013)	Wave 3: Innovation Surge (2013-2025)
Market Opportunity Identification	• Environmental consciousness emerging from 1970s movement • Niche consumer segments • No standardized definitions or metrics • Value-driven by personal environment	• LEED certification system launch (1998) • Green Building Certification Institute (GBCI) created (2008) • Media coverage of climate change increasing	• Paris Agreement (2015) • ESG investment criteria and climate action plans • Data-driven performance expectations • Technology enables new service models
Venture Creation and Sustainability	• Small-scale, independent operations • Limited scalability • Idealistic and mission-driven • Local service provision	• Business case orientation • Venture capital and institutional funding emerging • Green building education and training Energy efficiency technologies • Moderate growth with market mainstreaming	• Entrepreneurial support to green business • Strong access to impact investment and ESG capital • Scalable technology-enabled models
Client Segment Dynamics	• Predominantly B2C • Individual consumers (homeowners, small business owners) • Relationship-based transaction • Limited market penetration	• Shift to B2B • Consulting and certification services • Institutional clients (government agencies, universities, hospitals) • Contract-based professional services	• B2B with impact focus • Corporations with public net-zero commitments • Performance-based contracts • Data and analytics services
Perceived Challenges & Opportunities	• Limited market awareness and demand • Lack of standardized definitions and certifications • Difficulty scaling beyond niche markets • Limited access to capital • First-mover advantages in nascent market • Limited competition • Experimental and exploratory	• Costly documentation requirements • Balancing environmental ideals with business pragmatism • "Strategic compromise" tensions • LEED certification creates standardized market • Professional credentialing creates career paths • Federal support "de-risks" market entry • Energy codes becoming more stringent • Increasing competition	• Supply chain transparency and data availability • Standardization of WLCA methodologies • Balancing new construction vs. building reuse • Rapid energy policy evolution requiring constant adaptation • Intense competition and specialization

Furthermore, the study reveals a critical sectoral and temporal pattern in client segment orientation among green construction entrepreneurs. The findings indicate that client focus (whether B2C or B2B) is not simply a strategic choice made during venture evolution but is strongly influenced by two structural factors: the industry segment in which the entrepreneur operates and the historical period in which the venture was founded. Earlier-generation entrepreneurs (e.g., P9 from the 1980s, P12 from 1985) operating in architecture and consulting naturally gravitated toward B2C models, serving individual homeowners seeking sustainable design solutions. In contrast, more recent ventures (e.g., P4, P7, P13 from 2020–2023) focused on building materials and product innovation are structurally oriented toward B2B markets, as their innovations target supply chain integration rather than end consumers.

This pattern suggests that entrepreneurial business model orientation is shaped not only by individual strategic decisions but also by broader industry structures and evolving market conditions. Previous research on sustainable business model innovation highlights how entrepreneurs adapt their value propositions and customer segments in response to sectoral constraints and institutional environments (Geissdoerfer et al., 2018). The findings of this study extend this perspective by demonstrating that, within the construction sector, these adaptations are strongly conditioned by the historical evolution of the market itself. In this sense, the client segment emerges as a path-dependent outcome, reflecting how the green building ecosystem has evolved over time, from niche residential experimentation to broader commercial and institutional adoption.

Consequently, the entrepreneurial process in the green building sector appears closely intertwined with the maturation of sustainability markets. As sustainable construction practices become increasingly institutionalized, entrepreneurial opportunities shift from direct consumer-oriented services toward supply-chain-oriented innovations and technology-driven solutions. This observation reinforces the idea that entrepreneurial opportunities are not static but emerge from changing institutional and market conditions, which shape both the nature of sustainable innovations and the actors they target.

This research also contributes to the literature by examining the divergent challenges faced by service-based and product-based green ventures, thereby illuminating how business model innovation unfolds in the context of sustainable construction. The findings indicate that service-oriented firms (e.g., P3, P9, P10, P11, P12) are particularly vulnerable to fluctuations in customer

preferences and short-term market demand. As a result, they frequently operate in what participants described as a "survival mode," characterized by strategic compromise and the blending of conventional and sustainable services in order to maintain financial stability. This adaptive behavior reflects patterns identified in the literature on entrepreneurial bricolage, where entrepreneurs creatively recombine available resources to navigate uncertainty and institutional constraints (Schayek & Dvir, 2009). In this sense, innovation within service-based green ventures appears primarily process-oriented and incremental, emerging through ongoing adjustments to market realities.

In contrast, product-based entrepreneurs (e.g., P4, P5, P7, P8, P13) face a fundamentally different set of constraints centered on access to capital and investment. Rather than responding primarily to customer demand volatility, these ventures confront significant barriers in securing the funding required for product development, testing, and commercialization. This dynamic highlights the capital-intensive nature of sustainable product innovation in the construction sector. It also exposes a structural misalignment between investor expectations, often shaped by venture capital models that prioritize rapid scalability and short-term returns, and the long development cycles typical of hardware-based sustainability innovations. As a result, green product entrepreneurs must navigate a financing landscape that is poorly suited to the realities of sustainable construction technologies. This finding extends existing discussions on sustainable business model innovation by illustrating how the feasibility of different green business models is shaped not only by market demand but also by the compatibility between sector-specific innovation processes and usual financial infrastructures.

Theme 2 explores the impact of stakeholders on green building adoption, where the adoption of green building practices is not an isolated entrepreneurial act, but a socially negotiated process profoundly shaped by the perspectives and behaviors of various stakeholders. This perspective aligns with stakeholder and institutional approaches to sustainable entrepreneurship, which emphasize that the diffusion of sustainability innovations depends not only on entrepreneurial initiative but also on the interaction between entrepreneurs and the broader network of actors that shape market expectations, norms, and decision-making processes. The research indicates a persistent and significant knowledge gap among clients and other professionals regarding the true value and long-term benefits of green building.

This finding resonates with the work of Häkkinen & Belloni (2011), who identified a lack of common language and understanding as a primary barrier to sustainable construction. This study extends their findings by framing this as a values translation challenge. Entrepreneurs are forced to become educators, investing considerable time and resources to translate the intrinsic value of sustainability (e.g., ecological health, social equity, resilience) into the extrinsic language of their stakeholders, primarily the language of economics (e.g., ROI, operational savings, asset value).

This leads to a critical finding regarding marketing and communication strategies. The prevailing discourse, as observed among participants, emphasizes profitability, operational cost reduction, and return on investment rather than the broader principles of ecological stewardship or social equity. While this pragmatic approach is effective in attracting a wider audience, it risks diluting the core message of environmental responsibility and inadvertently reinforces the very market logic that created the environmental problems in the first place. This dynamic illustrates how opportunity recognition occurs within contradictory institutional contexts, where entrepreneurs must reconcile environmental values with prevailing market logics (Schaltegger & Wagner, 2011; Shane & Delmar, 2004). This dynamic can be interpreted as a form of strategic or self-imposed greenwashing, where environmental value propositions are intentionally reframed in economic terms in order to gain market legitimacy.

In other words, the analysis underscores that this marketing approach reflects deeper market realities about investment decision-making and client priorities. This suggests that sustainability becomes marketable when it is positioned as a pathway to improved financial performance, faster project completion, or reduced operational costs, rather than as an environmental imperative. This finding has significant implications for how green building entrepreneurs develop their value propositions and communicate with potential clients and investors.

A significant barrier to widespread adoption remains the high perceived initial cost of projects, a finding consistent with a large body of literature (Darko & Chan, 2017). This is particularly true for resource-constrained clients, who are less inclined to make the upfront investment required for green construction. Compounding this issue is a persistent prejudice against the use of recycled and waste materials, which are often perceived as being of inferior quality. This reveals a deep-seated cultural bias within the construction industry that equates novelty with quality and recycled content with risk. Overcoming these financial and perceptual barriers requires not just

entrepreneurial action but a broader cultural shift, a point that the existing literature often under-emphasizes. This study contributes by highlighting the entrepreneur's role as a cultural change agent within the construction sector, reinforcing perspectives that view entrepreneurs as agents of institutional change in sustainability transitions.

Theme 3 explores the market and regulatory dynamics shaping the green building sector, which emerges as a complex and evolving landscape characterized by both opportunities and structural distortions. The research identifies the phenomenon of conventional companies that engage in greenwashing by adopting minimal sustainability measures as a strategic ploy to capture a share of the green market. This "low-hanging fruit" approach, as described by participants, allows them to maintain their profit-maximizing operational models while projecting an environmentally conscious image.

This finding provides empirical weight to the concept of the "sustainability curtain" (Gibbs & O'Neill, 2014), where superficial green claims obscure genuine innovation and create market skepticism. This dynamic also reflects broader legitimacy challenges faced by sustainable ventures operating in markets where environmental claims are unevenly verified, forcing authentic green entrepreneurs to actively differentiate themselves from superficial sustainability practices. Therefore, it directly penalizes authentic green entrepreneurs, who must invest disproportionate resources in proving their legitimacy. This phenomenon can be described as an "authenticity tax," capturing the additional effort and resources required to demonstrate credibility in markets affected by greenwashing. This tax is paid through higher marketing costs, longer sales cycles, and the need for expensive third-party certifications to simply establish a baseline of trust that conventional businesses take for granted.

Structural barriers also impede the growth of the green building market. Such barriers have been widely discussed in the sustainable construction literature, where fragmented industry structures and limited collaboration networks are identified as key obstacles to innovation diffusion (Darko & Chan, 2017). These include the geographical concentration of work, which limits opportunities for entrepreneurs in certain regions, and a lack of robust networks and collaboration, which stifles knowledge sharing and innovation. In response, many entrepreneurs (38% of the sample) are turning to accelerators and incubators to enhance their expertise and expand their networks.

This finding aligns with research on entrepreneurial learning, which highlights the importance of experiential and peer-based knowledge exchange in emerging industries. This addresses "How do they build the knowledge and capabilities of their supply chains and project partners?" by demonstrating that green entrepreneurs in construction rely more on peer-to-peer knowledge transfer than on institutional support. This suggests that formal support programs, often designed with a top-down structure, may be misaligned with the actual needs of entrepreneurs in this sector, who require highly contextual, trust-based advice from those with shared lived experience.

Finally, the study reveals a profound sense of caution among entrepreneurs when it comes to implementing cutting-edge innovations, a finding that directly speaks to the evolution of green entrepreneurial identity. This hesitancy is largely attributable to a lack of clear regulations and the inherent risks of a nascent market. The characterization of building codes as "the lowest standard you can build to and not get sued" reveals a regulatory philosophy that prioritizes legal protection over environmental performance or innovation encouragement.

Previous research has highlighted the significant role of regulatory and policy frameworks in shaping the adoption of sustainable construction practices, often identifying regulatory uncertainty and approval processes as barriers to innovation within the construction sector (Darko & Chan, 2017). This study suggests that the challenge is not simply the presence of regulation but the absence of clear and forward-looking regulatory pathways for sustainable innovation. This creates what can be described as a "regulatory catch-22 cycle", where entrepreneurs must demonstrate the viability of innovative solutions before regulatory systems are adapted to accommodate them. This finding nuances the common assumption that regulation necessarily constrains innovation; instead, it suggests that the "absence" of clear, forward-looking regulation creates a vacuum of uncertainty that is even more detrimental to innovation than stringent rules. Entrepreneurs are not asking for less regulation, but for smarter regulation that creates a level playing field and de-risks innovation.

Although these findings are grounded in the green building sector, the dynamics identified in this study, such as values translation, legitimacy challenges associated with greenwashing, and regulatory uncertainty surrounding sustainable innovation, may also be relevant to other sustainability-oriented industries where entrepreneurs operate under similar institutional constraints. Consequently, these insights contribute to broader discussions on sustainable entrepreneurship beyond the construction sector.

5.1 Contribution to the Literature

This research contributes to the growing body of literature on green entrepreneurship and sustainable construction by addressing several gaps identified in the critical review of the literature (section 2.5). While prior research has provided important insights into systemic barriers to sustainable construction (Häkkinen & Belloni, 2011), the fluid nature of green entrepreneurial identity (Gibbs & O'Neill, 2014), and the principles of sustainable business model innovation (Geissdoerfer et al., 2018), the empirical understanding of how these dynamics unfold in the day-to-day practice of green entrepreneurs in the construction sector remains limited. By examining the experiences of entrepreneurs operating in the sustainable building market, this thesis contributes to bridging these gaps in several ways.

First, this study advances the literature on sustainable construction by providing empirical insight into how green entrepreneurs navigate the systemic barriers identified in prior research. Existing studies have documented regulatory challenges, organizational inertia, and knowledge gaps that obstruct the adoption of sustainable building practices. However, these barriers have often been examined at a macro or systemic level, leaving the micro-level entrepreneurial responses relatively unexplored. The findings of this thesis demonstrate that entrepreneurs actively develop adaptive strategies to overcome these structural obstacles, including navigating regulatory uncertainty, addressing clients' financial constraints, operating within geographically dispersed niche markets, and managing fragmented industry networks. In doing so, this research moves beyond identifying barriers to explaining how entrepreneurs interact with and respond to them in practice.

Second, this research contributes to the literature on sustainable business models by examining how green construction ventures capture value to better target customers and adapt product offerings in response to sector-specific constraints. The findings highlight that entrepreneurs often adopt hybrid approaches that combine environmental objectives with pragmatic business considerations. In particular, approaches such as strategic compromise, value translation, niche market targeting, and innovation positioning illustrate how entrepreneurs reconcile environmental ambitions with economic viability in a sector characterized by high costs, risk-averse practices, and complex regulatory environments.

Third, this study contributes to the literature on green entrepreneurial identity and commitment. Previous research has highlighted the fluid and negotiated nature of green entrepreneurial identity, noting that entrepreneurs may move between environmentally oriented and conventional business practices. The findings of this thesis extend this discussion by demonstrating that green entrepreneurs in the construction sector often maintain their environmental commitments while simultaneously adapting their practices to market realities. Rather than abandoning sustainability goals, entrepreneurs develop strategies that allow them to balance environmental values with the financial and operational pressures of the construction market. This insight contributes to a deeper understanding of how sustainability commitments are sustained and operationalized within challenging institutional contexts.

Fourth, this research contributes to the understanding of entrepreneurs as knowledge brokers within sustainability transitions. The literature has identified knowledge gaps and the lack of a shared language as major barriers to sustainable construction, yet the mechanisms through which these gaps are addressed remain underexplored. The findings of this study reveal that green entrepreneurs frequently act as intermediaries who translate sustainability concepts into forms that can be understood by clients, collaborators, regulators, and investors. Through activities such as educating clients about lifecycle costs, coordinating across fragmented professional networks, and demonstrating innovative solutions through pilot projects and case studies, entrepreneurs play a crucial role in diffusing sustainable practices across the construction ecosystem.

Finally, this study contributes to the emerging literature on the institutional and market dynamics shaping green entrepreneurship in the construction sector. The findings reveal that sustainability functions simultaneously as a market differentiator and a structural constraint. While sustainability positioning enables entrepreneurs to access niche markets and differentiate themselves from conventional competitors, it also exposes them to unique challenges, including higher upfront costs, regulatory uncertainty, and competition from established firms engaging in selective sustainability practices or greenwashing. By highlighting these paradoxical dynamics, this research provides a more nuanced understanding of the structural conditions under which green entrepreneurship develops within the construction industry. The resumed contribution of this study is shown in Table 5.2 below.

Table 5.2 Contribution to the literature

Literature Gap	Contribution of This Thesis
Limited understanding of how entrepreneurs navigate barriers	Empirical evidence of strategies used to overcome regulatory, financial, and industry constraints
Limited research on green construction business model innovation	Identification of hybrid sustainability strategies and entrepreneurial compromises
Limited insight into entrepreneurial commitment dynamics	Demonstrates how entrepreneurs maintain sustainability values while adapting to market realities
Limited research on entrepreneurs as knowledge brokers	Shows how entrepreneurs translate sustainability knowledge to clients, regulators, and industry partners

Overall, this thesis contributes to the literature by shifting the focus from abstract discussions of sustainable innovation toward a deeper understanding of the lived experiences, strategic adaptations, and institutional interactions that shape green entrepreneurship in the construction sector. By examining how entrepreneurs navigate complex regulatory environments, market pressures, and knowledge gaps, this research offers insights that enrich both theoretical discussions of green entrepreneurship and practical efforts to accelerate sustainability transitions within the built environment.

5.2 Limitations of the Study

It is crucial to acknowledge a series of important limitations that frame the context of this research. Firstly, the study does not seek statistical generalization but rather aims to generate analytical insights into the phenomena under investigation. However, although the sample provides a heterogeneous set of cases, the relatively small sample size inevitably constrains the representativeness of the findings. Consequently, the results should be interpreted as indicative, acknowledging that they may not capture the full range of entrepreneurial practices and sustainability orientations present across the broader industry.

Secondly, the research exclusively interviewed green entrepreneurs of Small and Medium-sized Enterprises (SMEs). This focus, while providing deep insights into the entrepreneurial journey, lacks the perspectives of other key stakeholders, such as customers, investors, and entrepreneurs

from large corporations. A more comprehensive understanding of the green building ecosystem would necessitate the inclusion of these diverse viewpoints.

Thirdly, the study concentrated on “green-green businesses,” that is, ventures that are fundamentally built on a green mission, rather than “green businesses” which may incorporate green practices into a more traditional business model (Isaak, 1998). This distinction, while allowing for a focused analysis of deeply committed green entrepreneurs, may limit the applicability of the findings to the broader spectrum of businesses engaged in sustainable practices.

Fourthly, the individual business state of each entrepreneur at the time of the interview could have influenced their responses. Factors such as the business's financial health, recent successes or failures, and the entrepreneur's personal circumstances can all influence their perceptions and attitudes. While this is an inherent limitation of interview-based research, it is important to acknowledge its potential impact.

Finally, the study faced a theoretical limitation in its ability to investigate large green companies. The distributed leadership structures in large corporations make it challenging to identify a single “entrepreneur” responsible for the company's green initiatives. Titles such as CEO, head of department, or other executive roles are often held by individuals who may not have been the principal drivers of the company's green transition. This makes it difficult to apply the same entrepreneurial lens to large corporations as can be applied to SMEs.

5.3 Future Research

Future research should incorporate the views of clients, investors, regulators, and entrepreneurs from large corporations to develop a more holistic, 360-degree understanding of the ecosystem. This could take the form of a multi-case study that follows a single project from conception to completion, interviewing all key actors.

A longitudinal study tracking the long-term performance of the 13 ventures in this study over the next 5-10 years would provide invaluable insights into their sustainability and growth trajectories, and how their strategies evolve over time. This would allow for a deeper understanding of the long-term impacts of the challenges and opportunities identified here.

CHAPTER 6 CONCLUSION

The key findings of this qualitative study demonstrate that the journey is tense with challenges that diverge significantly for service-based and product-based firms and are profoundly shaped by a complex ecosystem of stakeholders who must be educated and aligned. The market itself is a distorted landscape, where authentic green entrepreneurs are penalized by an "authenticity tax" created by greenwashing competitors, and where regulatory frameworks, particularly building codes, suppress rather than support innovation.

From a theoretical perspective, this study contributes to a more granular understanding of green entrepreneurship in the construction sector by:

- Synthesizing the behavioral and opportunity-recognition perspectives within a sector-specific context, showing that green entrepreneurship here is a function of both who you are (values) and what you see (market identification).
- Identifying and naming the "values translation challenge" and the "authenticity tax" as key conceptual contributions that describe the unique communication and legitimacy burdens faced by green entrepreneurs.
- Revealing the critical role of informal, peer-to-peer networks, equally important (if not more) than the support systems for the SMEs in the green building sector.
- Challenging the conventional wisdom on regulation by showing how the absence of smart, performance-based regulation is a primary barrier to innovation, creating a vacuum of uncertainty that de-risks the status quo.

In conclusion, the journey toward a more sustainable built environment is not a simple path but a complex, multi-dimensional endeavor. It requires a new generation of entrepreneurs who are not just innovators but also educators, cultural change agents, and systems thinkers. They are the catalysts in a slow-moving, deeply entrenched industry. By illuminating the key dynamics at play, this research provides a deeper understanding of the challenges and opportunities they face and offers a clear call to action for creating a market that rewards genuine commitment to building a greener future. The future of the built environment depends not just on the passion of these entrepreneurs, but on our collective willingness to build a system that allows them to succeed.

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APPENDIX A CERTIFICAT D'APPROBATION ÉTHIQUE

POLYTECHNIQUE MONTRÉAL
UNIVERSITÉ D'INGÉNIERIE

CER-2425-35-D

Montréal, le 17 février 2025

Objet: Approbation éthique – « Entrepreneuriat dans le secteur de la construction verte et du bâtiment durable » - Projet CER-2425-35-D

M. Expedito Xavier Gurguri Neto,

J'ai le plaisir de vous informer que le Comité d'éthique de la recherche, selon les procédures en vigueur, en vertu des documents qui lui ont été fournis, a examiné le projet de recherche susmentionné et conclu que ce dernier répond aux normes en vigueur au chapitre de l'éthique de la recherche énoncées dans la *Politique en matière d'éthique de la recherche avec des êtres humains* de Polytechnique Montréal.

Veuillez noter que le présent certificat est valable pour une durée d'un an, soit du 17 février 2025 au 16 février 2026, pour le projet tel qu'approuvé au Comité d'éthique de la recherche avec des êtres humains.

Veuillez noter que conformément aux exigences auxquelles l'institution et son personnel sont assujettis afin d'être admissibles aux fonds des organismes subventionnaires, il est de votre responsabilité de déposer au CÉR un rapport annuel ou un rapport final avant l'expiration de la présente approbation éthique afin de l'informer de l'avancement de vos travaux. Le formulaire à remplir est disponible à l'adresse suivante : (http://www.polymtl.ca/recherche/formulaires-et-guides).

De plus, il est de votre responsabilité d'informer le CER de toute modification importante qui pourrait être apportée au protocole expérimental avant sa mise en œuvre, de même que de tout élément ou évènement imprévu pouvant avoir une incidence sur le bien-être ou l'intégrité des participant(e)s impliqué(e)s dans le projet de recherche. Nous vous invitons aussi à nous signaler tout problème susceptible d'avoir une incidence sur les membres de l'équipe de recherche.

Je vous souhaite bonne chance dans la poursuite de vos travaux.

Nous vous prions d'agréer, Monsieur, l'expression de nos sentiments les meilleurs,

Philippe Doyon-Poulin

Philippe Doyon-Poulin, président
Comité d'éthique de la recherche
Polytechnique Montréal

c.c. Direction de la formation et de la recherche; Service des Finances
Mario Bourgault, professeur titulaire, Département de mathématiques et de génie industriel
Yabo Octave Niamié, Département de mathématiques et de génie industriel
Cochercheurs
p.j. Certificat # CER-2425-35-D

Comité d'éthique de la recherche avec des êtres humains
Tél. : 514 340-4711 poste : 3755
Fax : 514 340-4992
Courriel : ethique@polymtl.ca

Adresse postale
C.P. 6079, succ. Centre-Ville
Montréal (Québec) Canada H3C 3A7

Campus de l'Université de M
2900, boul. Édouard-Montpet
2500, chemin de Polytechniq
Montréal (Québec) Canada H

POLYTECHNIQUE MONTRÉAL
UNIVERSITÉ D'INGÉNIERIE

CER-2425-35-D

CERTIFICAT D'APPROBATION ÉTHIQUE

Le Comité d'éthique de la recherche de Polytechnique Montréal, selon les procédures en vigueur, en vertu des documents qui lui ont été fournis, a examiné le projet de recherche suivant et conclu qu'il respecte les règles d'éthique énoncées dans sa Politique en matière d'éthique de la recherche avec des êtres humains.

Projet	
Titre du projet	**Entrepreneuriat dans le secteur de la construction verte et du bâtiment durable** **CER-2425-35-D**
Étudiant requérant	**Expedito Xavier Gurguri Neto**, Candidat à la maitrise recherche, Département de mathématiques et de génie industriel
Sous la direction de:	**Mario Bourgault, professeur titulaire**, Département de mathématiques et de génie industriel, Polytechnique Montréal & **Yabo Octave Niamié**, Département de mathématiques et de génie industriel, Polytechnique Montréal.
Avec la collaboration de:	Gonzalo Lizarralde (UdeM); Francis Bissonnette (Batimatech)

Financement	
Organisme	CRSNG
No de UBR	3180052
Programme	GMT
No d'octroi:	
Titre original de l'octroi:	
Chercheur principal:	Yabo Octave Niamié

MODALITÉS D'APPLICATION

Toute modification importante qui pourrait être apportée au protocole expérimental doit être transmise au Comité avant sa mise en œuvre.

L'équipe de recherche doit informer le Comité de tout élément ou évènement imprévu pouvant avoir une incidence sur le bien-être ou l'intégrité des participant(e)s impliqué(e)s dans le projet de recherche ainsi que tout problème susceptible d'avoir une incidence sur les membres de l'équipe de recherche.

Selon les règles universitaires en vigueur, un suivi annuel est minimalement exigé pour maintenir la validité de la présente approbation éthique, et ce, jusqu'à la fin du projet. Le questionnaire de suivi est disponible sur la page web du Comité.

Philippe Doyon-Poulin

Philippe Doyon-Poulin, président
Comité d'éthique de la recherche
Polytechnique Montréal

Date de délivrance :
17 février 2025

Date de fin de validité :
1er mars 2026

Date du prochain suivi :
16 février 2026

Comité d'éthique de la recherche avec des êtres humains
Tél : 514 340-4711 poste : 3755
Fax : 514 340-4992
Courriel : ethique@polymtl.ca

Adresse postale
C.P. 6079, succ. Centre-Ville
Montréal (Québec) Canada H3C 3A7

Campus de l'Université de Montréal
2900, boul. Édouard-Montpetit
2500, chemin de Polytechnique
Montréal (Québec) Canada H3T1J4

APPENDIX B SEMI-STRUCTURED INTERVIEW QUESTIONNAIRE

POLYTECHNIQUE MONTRÉAL
TECHNOLOGICAL UNIVERSITY

Research Project Questionnaire

Semi-Structured Interview Questionnaire

The questionnaire is organized into three main sections. The first section (A) aims to understand how entrepreneurs in the construction sector identify, evaluate, and exploit opportunities related to sustainability. This allows for an analysis of decision-making processes, particularly those concerning the integration of sustainable development into their projects. The second section (B) explores the external factors that influence the adoption of sustainable practices by entrepreneurs. Finally, the third section (C) examines the impact of sustainable initiatives on business development in the construction sector, with a focus on the benefits and challenges encountered.

A) How entrepreneurs in the construction sector identify, evaluate, and exploit opportunities related to sustainability.

1. Many companies choose to explore sustainable technologies and practices to stand out in the market and drive innovation. What initially attracted you to sustainable construction?
2. Following your process of identifying opportunities, how did you determine that this was a genuine opportunity for your business?
3. In a field as dynamic as sustainable construction, staying informed about the latest innovations is crucial to maintaining a competitive edge and seizing new opportunities. How do you ensure that you stay at the forefront of innovation? Do you use specific sources or specialized networks to enhance your projects?
4. Companies often need to adjust their strategies to meet the new demands of green markets. Does your consideration of sustainability influence your financial, marketing, or project management strategies? Why or why not?

B) External factors influencing the adoption of sustainable practices by entrepreneurs

5. Although more and more eco-friendly solutions and technologies are becoming available, their adoption is not always straightforward. What are the main challenges you face when trying to integrate sustainable practices into your products or services?

6. Market conditions—such as economic fluctuations, consumer demand, and new regulations—can influence a company's ability to adopt sustainable practices. How do current market conditions affect your ability to implement sustainable practices in your business?
7. Regulations, tax incentives, and subsidy programs can either encourage or discourage the adoption of sustainable practices. In what ways do government policies influence your sustainability-related decisions?
8. The adoption of sustainable practices by entrepreneurs is not only driven by their own choices but also influenced by various external sources. What external factors—such as customer expectations, competitive pressure, or technological innovations—have most influenced your decision to adopt or change sustainable practices in your business?

C) Impact of sustainable initiatives on business development in the construction sector

9. Sustainable initiatives can have a significant impact on various aspects of a business, such as reputation, customer base, and costs. Are there any sustainable initiatives you have implemented in your company where you have noticed changes in your clients, costs, or reputation?
10. The integration of sustainable practices not only affects short-term decisions but can also transform how a company prepares to face future challenges and remain competitive in an ever-evolving environment. Has the choice to adopt sustainable practices strengthened your company's long-term competitiveness? How?
11. Support for entrepreneurs seeking to adopt sustainable practices is essential to facilitate the transition to greener construction and architectural methods. This support can take various forms, such as grants, training programs, expert resources, or collaborative networks. Do you think there is sufficient support available for entrepreneurs wanting to adopt sustainable practices? Why or why not? Can you give examples of support you found useful or gaps you have identified?
12. Technological innovations and new regulations are helping shape the future of sustainability in this field. How do you envision the future of sustainability in your sector? What trends, innovations, or challenges do you think will be important to consider in the coming years?

End of questionnaire.