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Research Article

Assessment of the Integration of Sustainable Materials in Residential Construction Projects in New Zealand: Enablers and Barriers

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ABSTRACT

New Zealand's construction industry contributes significantly to national greenhouse-gas emissions, prompting calls to adopt sustainable materials and low-carbon building practices. Globally, the construction and building sector accounts for about 37-38 percent of total CO2 emissions, and within New Zealand, building and construction contribute roughly 15 percent of national emissions. Materials such as cross-laminated timber (CLT), recycled steel, and low-carbon concrete offer potential reductions in embodied carbon and improved life-cycle performance.

This study explores how sustainable materials are being integrated into New Zealand's residential construction sector. A mixed-methods approach combining a survey of industry professionals with a literature and policy review was used to identify major enablers and barriers. Findings indicate that respondents recognise the long-term benefits of sustainable materials, but perceive adoption as constrained by high upfront costs, fragmented supply chains, regulatory uncertainty, and knowledge gaps. Government incentives, stronger regulatory frameworks, and greater client demand are identified by respondents as potential enablers of wider adoption. Recommendations include targeted financial incentives, industry training, supply-chain support, and clear building code guidelines. The findings suggest that these measures could support New Zealand's broader emissions-reduction goals and contribute to greater alignment between construction practices and the Sustainable Development Goals (SDGs).

Keywords: Sustainable materials, Residential construction, Policy and incentives, Carbon reduction, New Zealand.

BACKGROUND

The global construction sector is responsible for nearly 37 percent of CO2 emissions, while New Zealand's building and construction activities contribute about 15 percent of national emissions (Ministry for the Environment, 2022; United Nations Environment Programme, 2023). These impacts highlight the need for greater consideration of low-carbon materials and construction practices. Materials such as cross-laminated timber (CLT), hempcrete, and mycelium-based insulation have the potential to reduce embodied energy and carbon impacts while providing alternative approaches to conventional construction (Mestika & Suranto, 2025). The adoption of lower-carbon materials is consistent with the objectives of New Zealand's Zero Carbon Act 2019 and the Emissions Reduction Plan (MBIE, 2024).

Despite these potential benefits, the integration of sustainable materials in residential construction remains subject to several barriers, including high capital costs, conventional construction practices, knowledge limitations, and perceived risk (Ashurmamadova & Rexhepi, 2024). Häkkinen et al. (2015) found that design teams may lack the knowledge and tools required to assess embodied-carbon reductions and apply alternative materials effectively. Such knowledge limitations and perceived risks may encourage continued reliance on familiar construction materials.

Supply-chain constraints may further affect the availability and feasibility of sustainable materials. Limited availability, reliance on imported products, regional supply limitations, and cost volatility can create additional challenges for residential construction projects. In addition, some emerging building products may require alternative-solution approval pathways, increasing the time and uncertainty associated with their use (MBIE, 2024). These factors may encourage practitioners to select established materials with more familiar procurement and compliance pathways.

New Zealand has introduced initiatives such as the Homestar rating system and green financing programmes to encourage more sustainable construction practices. However, the extent to which these measures influence material selection may depend on their uptake by clients, developers and construction professionals. International evidence also indicates that regulatory requirements and financial incentives can influence the adoption of sustainable construction practices.

Although previous research has examined individual barriers to sustainable construction, there is limited empirical evidence combining economic, knowledge, supply-chain, market and policy perspectives within the specific context of New Zealand residential construction. This study addresses this gap by examining respondents' perceptions of the factors that enable or hinder sustainable-material integration through an exploratory survey of construction professionals, supported by open-ended responses and relevant literature and policy evidence.

LITERATURE REVIEW

Economic Barriers

A major barrier to the integration of sustainable materials is their higher upfront cost compared with conventional alternatives. Developers and cost consultants may prioritise initial capital expenditure over whole-life value, particularly where projects operate under tight financial margins and short-term procurement considerations(Bennett & Mayouf, 2021; Nasereddin & Price, 2021). Previous research has also identified cost and risk perceptions as barriers to the adoption of sustainable materials, even where potential whole-life benefits may exist (Giesekam et al., 2016; Marsh et al., 2021). In the New Zealand context, these pressures may encourage lowest-cost procurement and reduce the willingness to adopt unfamiliar materials (BRANZ, 2025). Additional costs associated with design changes, specialised labour and certification can further discourage experimentation (BRANZ, 2015).

Knowledge and Cultural Barriers

Lack of professional knowledge remains another critical impediment. Häkkinen et al. (2015) found that design teams often lack tools and data to quantify embodied-carbon reductions. Misconceptions also persist; for example, bamboo and recycled aggregates may be perceived as weak or short-lived, despite evidence of their potential strength and durability (United Nations Environment Programme, 2023). Cultural inertia within construction organisations may further reinforce these barriers. Ashurmamadova and Rexhepi (2024) observed that experienced builders prefer traditional methods, citing reliability and familiarity. Such attitudes slow innovation diffusion. In New Zealand, many residential construction firms are small in scale, while established building practices and the regulatory system can favour familiar products over new or competing alternatives (BRANZ, 2025; Commerce Commission, 2022).

Supply-Chain Constraints

Limited supplier competition and established procurement practices can also affect the availability and uptake of alternative building products. The Commerce Commission (2022) found that competition in New Zealand's residential

building-supplies market was not working as well as it could and identified barriers affecting the entry and expansion of new and innovative products, including green building supplies. The study also found that the building regulatory system and established industry practices can favour familiar products over new or competing products. These conditions may make established products more attractive to construction practitioners and create challenges for the introduction and uptake of sustainable materials.

Policy and Regulatory Environment

Government policy and regulatory frameworks can influence the integration of sustainable materials by establishing minimum requirements, providing compliance pathways, and creating incentives for higher environmental performance. In New Zealand, voluntary sustainability-rating systems such as Homestar and Green Star provide frameworks for recognising buildings that achieve environmental performance beyond minimum Building Code requirements (New Zealand Green Building Council, 2025). However, because participation in these schemes is voluntary, their influence depends partly on client demand and market uptake.

New Zealand's Building for Climate Change programme represents a further policy response to building-related emissions. The programme proposes the introduction of embodied-carbon reporting for building projects, followed by progressively tighter embodied-carbon caps once sufficient sector capability and information have been established (MBIE, 2024). These measures could encourage greater consideration of embodied carbon during material selection and design. However, the implementation of new carbon requirements may also create additional demands for reliable carbon data, assessment tools, and industry capability.

Regulatory compliance can also influence the adoption of emerging materials. New Zealand's Building Code allows innovative methods or materials where compliance with the Code's performance requirements can be demonstrated. The Building Product Specifications introduced by MBIE in 2025 provide additional recognised product standards for use within acceptable solutions and verification methods (MBIE, 2025). Nevertheless, unfamiliar materials may still require additional testing, technical information, or professional assessment where established compliance pathways are unavailable.

Technological Enablers

Digital design platforms, particularly **Building Information Modelling (BIM)**, enable early evaluation of materials' environmental impact. BIM-integrated **material passports** track composition, recyclability, and provenance, supporting circular-economy principles (Atta et al., 2021). Such tools can improve information transparency and may support more efficient compliance and material-selection processes.

However, smaller New Zealand firms may face limitations in BIM capability and funding, which can constrain the adoption of digital tools (Likita et al., 2022).

Market and Client Demand

Client preference strongly influences builders' material decisions. Within New Zealand, initiatives such as Kainga Ora's public-housing projects illustrate how institutional clients can support the uptake of more sustainable specifications (MBIE, 2024).

Financial institutions can also contribute to this shift. Bank of New Zealand(Bank of New Zealand, 2025) provides Green Home Loan top-ups that offer preferential financing for qualifying sustainable housing improvements, potentially reducing the financial barrier for eligible homeowners. Such instruments are consistent with broader

green-mortgage approaches that link financial incentives to building environmental performance (Deloitte, 2023).

Summary of Literature Gaps

The literature identifies several recurring barriers and enablers associated with sustainable-material integration. These include high upfront costs and short-term financial considerations, knowledge and cultural barriers, supply-chain limitations, and the potential role of policy and digital tools. However, relatively few studies have examined these factors together within the specific context of New Zealand residential construction. In particular, there is limited empirical evidence concerning how construction professionals perceive the relative importance of these barriers and enablers. This study addresses this gap through an exploratory mixed-methods survey examining industry professionals' perceptions of these barriers and enablers, supported by relevant literature and policy evidence.

METHODOLOGY

Research Design

This research employs a mixed-methods design combining quantitative and qualitative components to capture both measurable patterns and explanatory insights. Mixed methods are appropriate where complex, multifactor social phenomena such as sustainable-material adoption require both statistical trends and narrative interpretation (Creswell & Creswell, 2018; Johnson & Onwuegbuzie, 2004).

The quantitative element uses a structured online survey to assess perceptions of cost, knowledge, supply-chain, and policy factors. The qualitative component derives from open-ended responses that clarify why respondents hold those views. Integrating both approaches enables quantitative trends to be considered alongside qualitative explanations and provides a broader understanding of respondents' perceptions (Bryman, 2016).

Sampling Strategy

A purposive sampling approach targeted professionals actively engaged in New Zealand residential construction. Participants included quantity surveyors, project managers, builders, developers, architects, and suppliers, whose roles directly influence material decisions. Invitations were distributed via professional networks, LinkedIn groups, and OPAIC-affiliated industry contacts between July and August 2025.

Although non-probability sampling limits statistical generalisability, it was selected for its efficiency in accessing informed respondents(Saunders et al., 2019). The final sample comprised 40 valid responses. The sample was predominantly Auckland-based, with 95% of respondents located in Auckland. Given the purposive, non-probability sampling approach and geographical concentration of respondents, the findings are interpreted as exploratory industry perceptions rather than statistically representative estimates of the wider New Zealand construction sector.

Data-Collection Procedures

Data was collected through a self-administered online questionnaire using Google Forms. Participation was voluntary and anonymous, with informed consent obtained at the start of the form. The instrument contained four sections:

1. **Demographic profile** - capturing participants' age, experience, role, and region.
2. **Closed-ended Likert items** - measuring agreement with statements about cost, awareness, supply, client de-

mand, and policy effectiveness on a 5-point scale.

3. **Open-ended questions** - inviting elaboration on perceived barriers, enablers, and suggestions for improvement.
4. **Optional comments** - allowing participants to note contextual factors or regional variations.

Secondary Data and Document Review

Secondary sources, including peer-reviewed articles, industry report, and policy documents, were used to contextualise the primary survey findings and compare them with existing evidence. Key sources included:

- Aotearoa New Zealand's First Emissions Reduction Plan (Ministry for the Environment, 2022).
- Building for Climate Change programme updates (MBIE, 2024).
- BRANZ reports on embodied carbon and CLT (BRANZ, 2015).
- NZGBC publications on Homestar and Green Star.
- Relevant journal studies (Atta et al., 2021; Häkkinen et al., 2015; Likita et al., 2022).

These documents informed the survey design and contextualised responses within national and international frameworks.

Data-Analysis Techniques

Quantitative data were exported to Microsoft Excel for cleaning and descriptive analysis. Frequencies and percentages were used to summarise agreement levels for each statement. Given the small sample size, the quantitative analysis focused on descriptive statistics rather than inferential statistical testing.

Open-ended responses were reviewed to identify recurring observations and comments relating to sustainable-material adoption. These responses were used as supporting qualitative evidence alongside the quantitative survey findings, providing additional context to respondents' perceptions of barriers and enablers.

Validity, Reliability, and Ethics

Reliability was enhanced through consistent administration of the same questions and pilot refinement. Content validity was supported by aligning the survey items with the research objectives and relevant literature. The pilot test was used to assess question clarity and consistency before data collection. The quantitative and qualitative findings were considered together to provide a more comprehensive interpretation of respondents' perceptions.

Ethical approval was obtained under Otago Polytechnic's low-risk ethics procedures (AIC-RE-2025-46). Participants could withdraw prior to submission; responses were stored securely and reported only in aggregated form. No personal identifiers were collected.

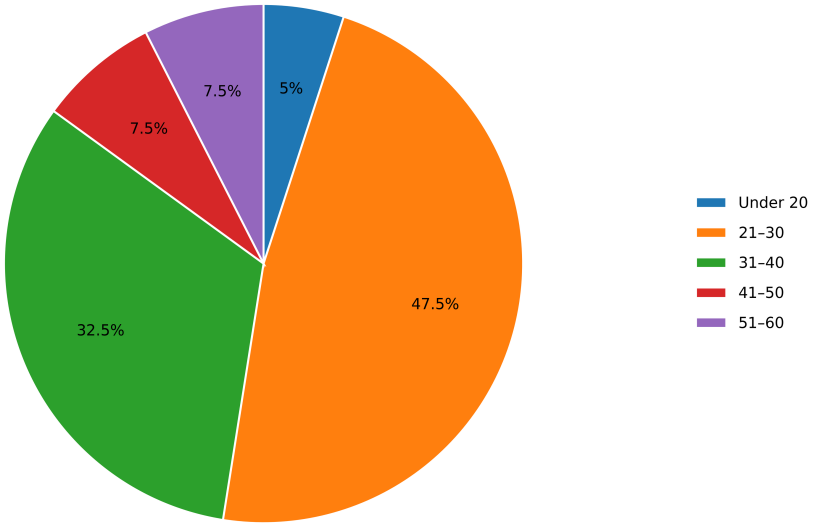
RESULTS AND DISCUSSION

Participant Demographics

A total of 40 industry professionals participated in the survey. The demographic profile provides context for interpreting the subsequent results.

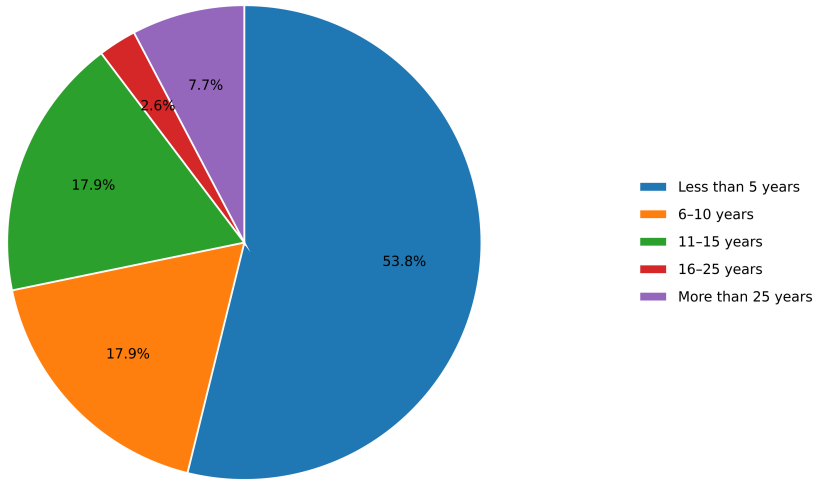
Age: Nearly half (47.5%) of respondents were aged 21-30, while 32.5% were aged 31-40. Smaller proportions were aged 41-50 and 51-60 (7.5% each), while 5% were under 20. **The sample was therefore weighted toward younger professionals, which should be considered when interpreting the findings.**

Figure 1: Age Distribution of Survey Participants



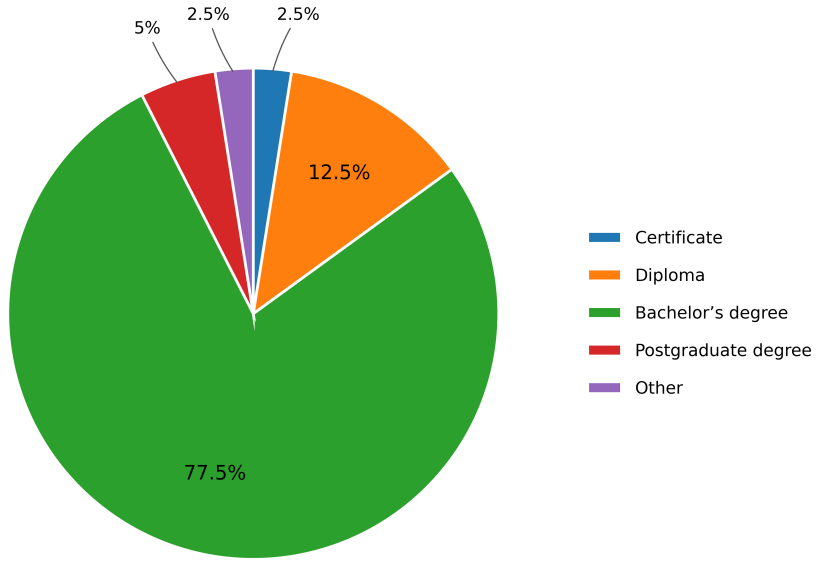
Experience: Among respondents who provided information on industry experience, 53.8% had less than 5 years of industry experience. A further 17.9% had 6-10 years and 17.9% had 11-15 years of experience. Smaller proportions had 16-25 years (2.6%) or more than 25 years (7.7%). *One respondent did not provide an answer to this question*. The sample was therefore weighted toward relatively early-career professionals, although a range of experience levels was represented.

Figure 2: Years of Work Experience in the New Zealand Construction Industry



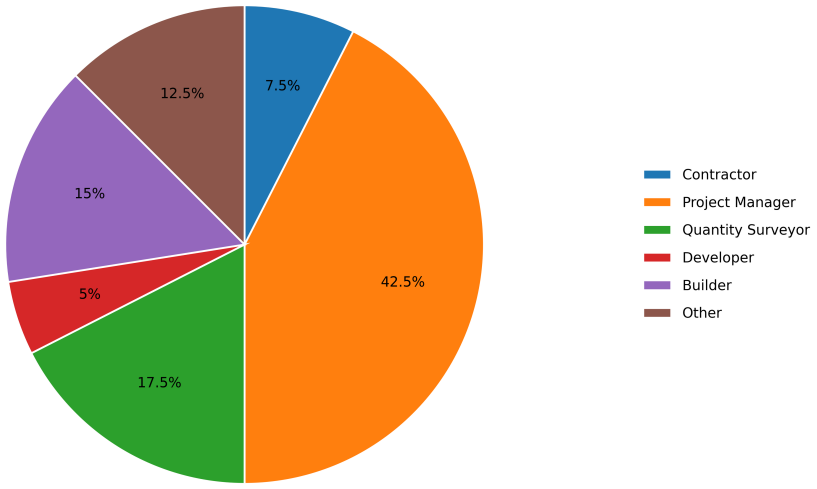
Education: The majority of respondents held a bachelor's degree (77.5%), while 12.5% held a diploma. A further 5% held a postgraduate degree, while 2.5% held a certificate and 2.5% reported other qualifications. The sample was therefore predominantly degree-qualified, which provides useful context when interpreting respondents' perceptions of sustainable-material adoption.

Figure 3: Highest Education Level of Participants



Professional Role: Project Managers represented the largest group of respondents (42.5%), followed by Quantity Surveyors (17.5%), Builders (15%), respondents in other roles (12.5%), Contractors (7.5%), and Developers (5%). The sample therefore included professionals involved in project management, cost management, construction, development, and other roles within the residential construction sector.

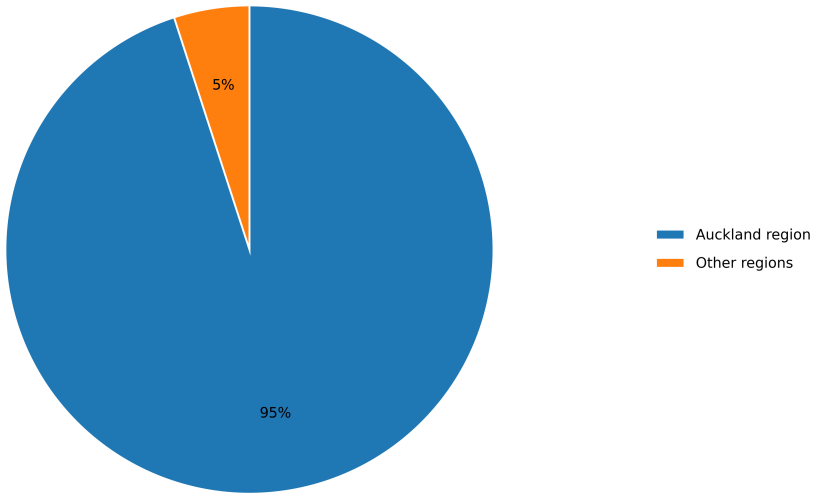
Figure 4: Primary Role of Participants in Their Organisation



Geographic Location: The majority of respondents (95%) were based in the Auckland region, while 5% were based in other regions, including Wellington, Christchurch, and Hamilton. The strong Auckland concentration should be considered when interpreting the findings, as the results may reflect conditions and professional perspectives more closely associated with the Auckland construction sector.

Overall, the demographic results indicate a relatively young and highly educated sample, with a strong representation of Project Managers and Auckland-based professionals. These characteristics should be considered when interpreting the subsequent findings, particularly because the sample is concentrated among Project Managers and professionals working in the Auckland region.

Figure 5: Office Location of Participants (by Region)



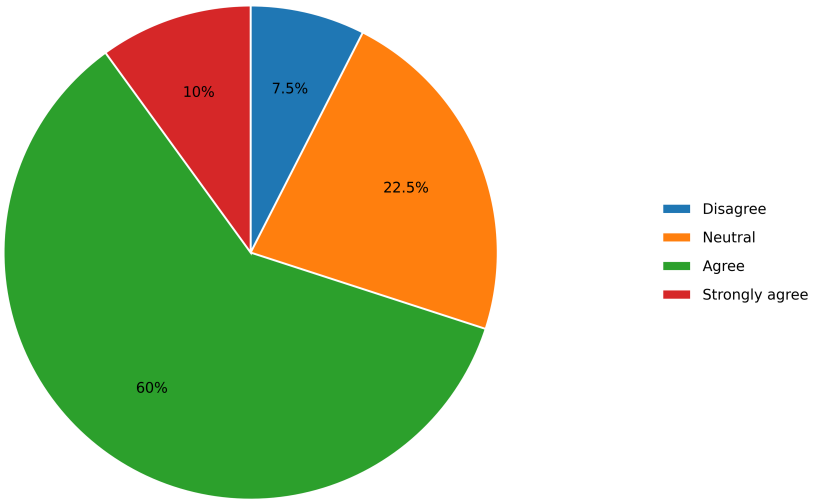
COST AND ROI PERCEPTIONS

The first research question addressed how construction companies view sustainable materials in terms of cost ver-

sus return on investment (ROI). Several survey items addressed this, revealing a nuanced perspective: respondents acknowledged the financial hurdles but also recognised potential long-term benefits.

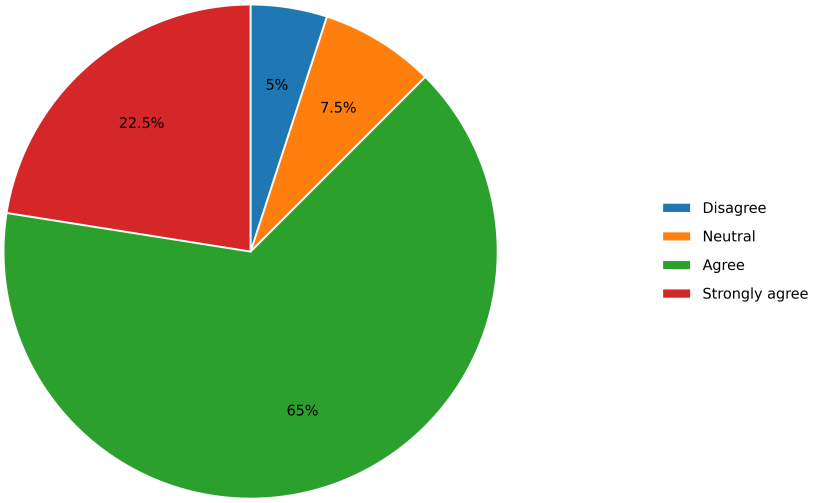
Upfront Cost Concern: The results indicate that upfront cost is a significant perceived barrier to sustainable-material adoption, with **70% of respondents agreeing** that sustainable materials are currently too expensive to justify the short-term return on investment, comprising **60% who agreed and 10% who strongly agreed.** A further **22.5%** were neutral, while **7.5% disagreed**. No respondents strongly disagreed.

Figure 6: Sustainable Materials Are Too Expensive to Justify the Return on Investment



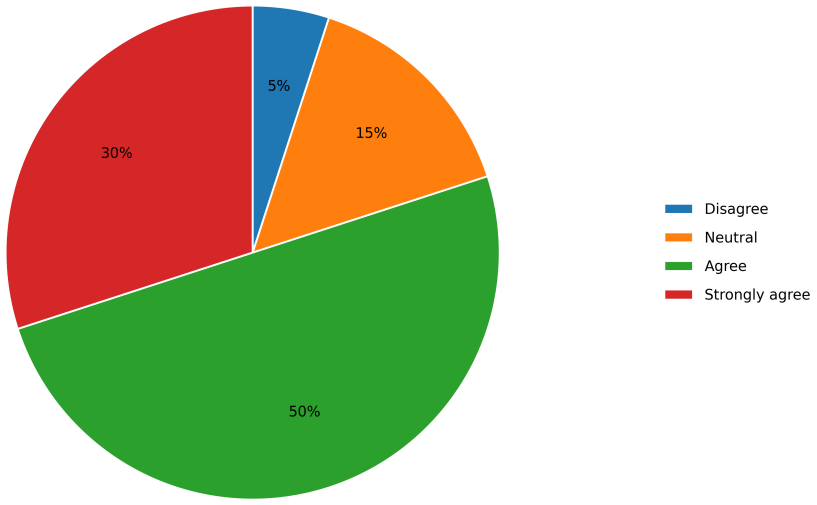
Long-Term Savings: Most respondents (87.5%) agreed that using sustainable materials **can result in** long-term cost savings, with 65% agreeing and 22.5% strongly agreeing. This indicates that respondents generally recognised **potential** long-term financial benefits from sustainable-material use despite concerns about higher upfront costs.

Figure 7: Using Sustainable Materials Results in Long-Term Cost Savings



Short-Term Focus: Most respondents (80%) agreed that construction companies prioritise short-term costs over long-term benefits when selecting materials, comprising 50% who agreed and 30% who strongly agreed. A further 15% were neutral, while 5% disagreed. These results indicate that respondents perceive short-term financial considerations as an important influence on sustainable-material selection.

Figure 8: Most Companies Prioritise Short-Term Costs Over Long-Term Benefits in Material Selection



Open-ended responses also highlighted the tension between higher upfront costs and potential long-term operating savings. Respondents noted that capital-cost constraints can make it difficult to justify sustainable options when they require higher initial expenditure, even where longer-term operating savings may be expected. This qualitative evidence supports the survey finding that immediate capital costs can influence material-selection decisions.

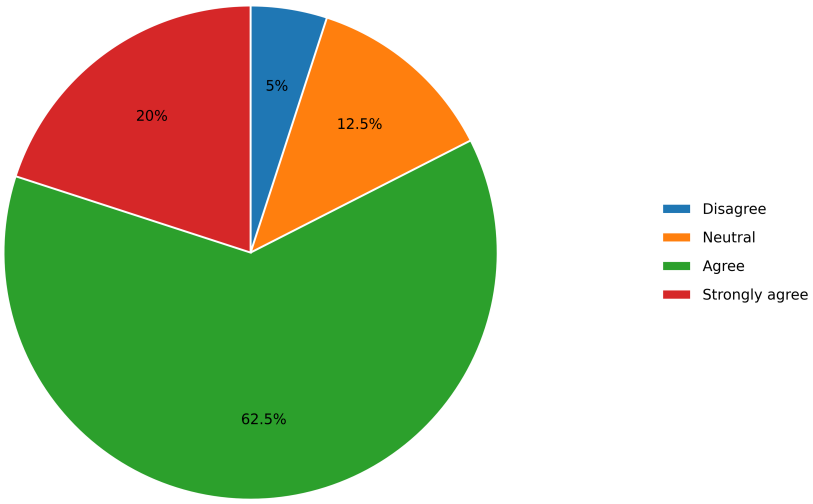
ADOPTION BARRIERS AND MOTIVATORS

The second research question focuses on identifying the **key barriers and enablers (motivators)** affecting sustainable material adoption. The survey included several statements addressing commonly cited barriers and also asked about factors that could encourage use. The results indicate that multiple barriers operate in tandem but also reveal strong agreement on certain actions that could support adoption.

High Upfront Costs: A total of 82.5% of respondents agreed that high upfront costs are a major barrier to adopting sustainable materials, comprising 62.5% who agreed and 20% who strongly agreed. A further 12.5% were neutral, while 5% disagreed. These results reinforce the finding that upfront cost is a significant perceived barrier to sustainable-material adoption.

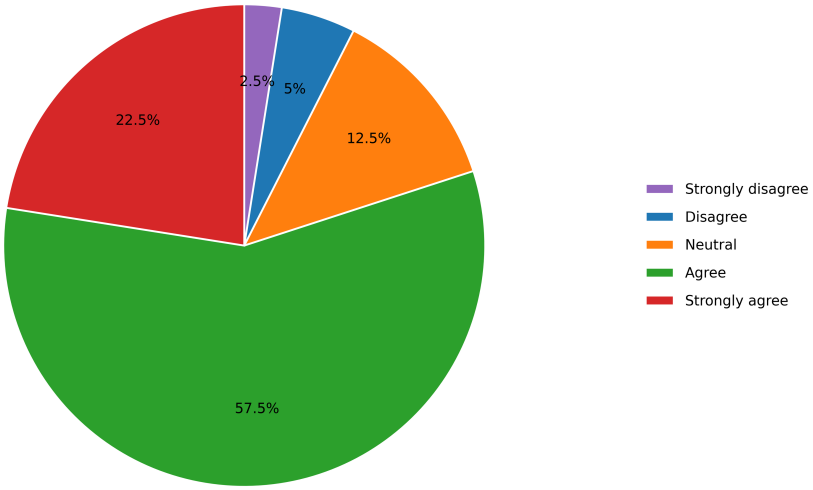
This finding is consistent with the earlier ROI results and further indicates that upfront cost is perceived as a significant barrier to sustainable-material adoption.

Figure 9: High Upfront Costs Are a Major Barrier to Adopting Sustainable Materials



Lack of Awareness/Knowledge: A total of 80% of respondents agreed that a lack of awareness or understanding hinders the adoption of sustainable materials, comprising 57.5% who agreed and 22.5% who strongly agreed. A further 12.5% were neutral, while 5% disagreed and 2.5% strongly disagreed. These results indicate that knowledge and awareness are perceived as significant barriers to sustainable-material adoption.

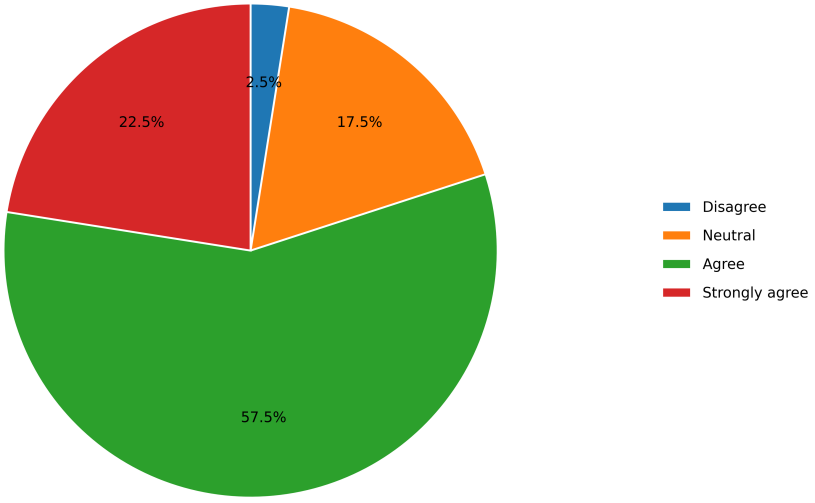
Figure 10: Lack of Awareness or Understanding Hinders the Adoption of Sustainable Materials



Open-ended responses also highlighted a lack of locally demonstrated examples of sustainable materials. Respondents indicated that limited practical experience with these materials can contribute to hesitation and uncertainty about their use. This qualitative evidence provides additional context for the survey finding that lack of awareness and understanding is perceived as a barrier to adoption.

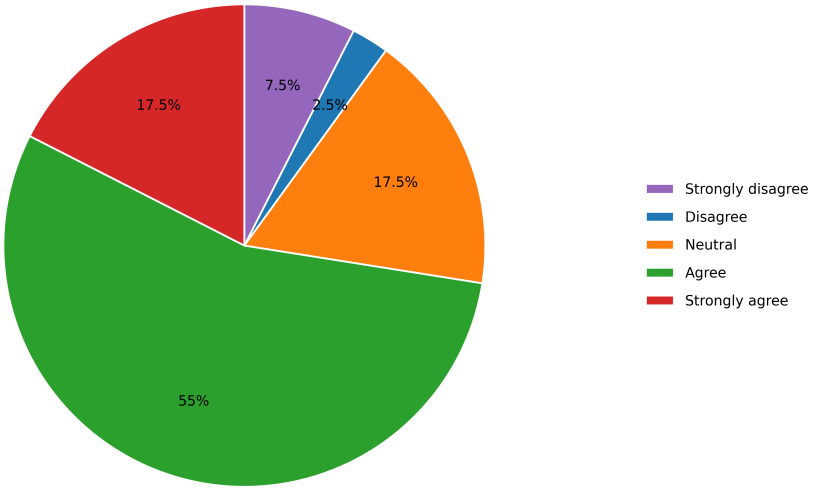
Limited Supply/Availability: A total of 80% of respondents agreed that limited supplier availability affects the use of sustainable materials, comprising 57.5% who agreed and 22.5% who strongly agreed. A further 17.5% were neutral, while 2.5% disagreed. These results indicate that supplier availability is perceived as a significant barrier to sustainable-material adoption.

Figure 11: Limited Supplier Availability Affects the Use of Sustainable Materials



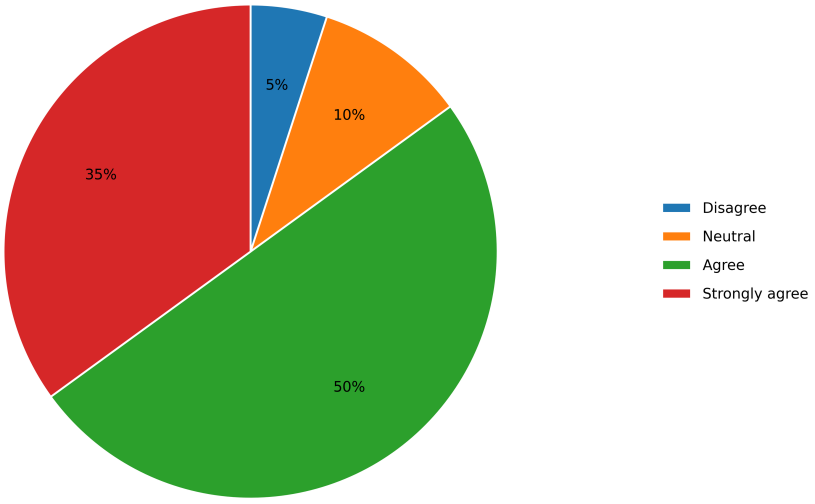
Importance of Training/Education: A total of 72.5% of respondents agreed that training and education can significantly increase the use of sustainable materials, comprising 55% who agreed and 17.5% who strongly agreed. A further 17.5% were neutral, while 2.5% disagreed and 7.5% strongly disagreed. These results indicate that respondents generally perceive training and education as a potential enabler of sustainable-material adoption.

Figure 12: Training and Education Can Significantly Increase the Use of Sustainable Materials



Client Demand as a Driver: A total of 85% of respondents agreed that client requirements strongly influence material selection, comprising 50% who agreed and 35% who strongly agreed. A further 10% were neutral, while 5% disagreed. These results indicate that client demand is perceived as an important influence on sustainable-material selection.

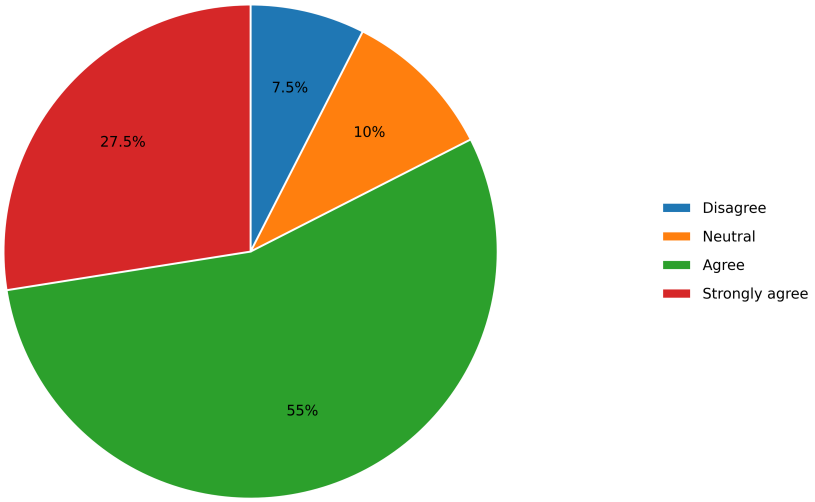
Figure 13: Clients' Demands Strongly Influence Material Selection in Projects



Role of Government Policy and Incentives

The third research question examines how government actions influence sustainable material adoption. New Zealand's policy environment is evolving, and the survey captured respondents' views on current policies and the need for further support. The results indicate that respondents perceive government as having an important role to play, while views on the effectiveness of existing policies are mixed.

Figure 14: Government Policies and Incentives Play a Significant Role in Promoting Sustainable Materials

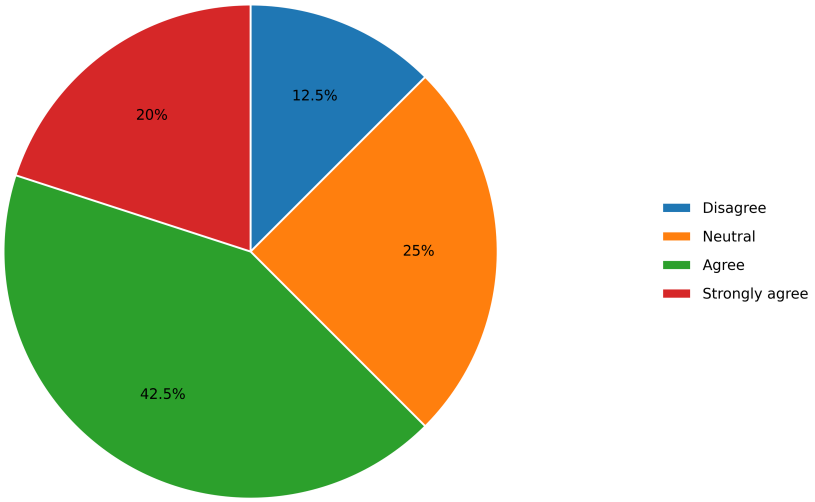


Significance of Government Influence: A total of 82.5% of respondents agreed that government policies and incentives play a significant role in promoting sustainable materials, comprising 55% who agreed and 27.5% who strongly agreed. A further 10% were neutral, while 7.5% disagreed. These results indicate that government policy and incentives are perceived as an important influence on sustainable-material adoption.

Effectiveness of Current Policies: Views on the effectiveness of current New Zealand policies were more mixed. A total of 62.5% of respondents agreed that current policies are effective in encouraging the use of sustainable materials, comprising 42.5% who agreed and 20% who strongly agreed. A further 25% were neutral, while 12.5% disagreed. These results indicate that although most respondents viewed current policies positively, a substantial proportion were neutral or unconvinced about their effectiveness.

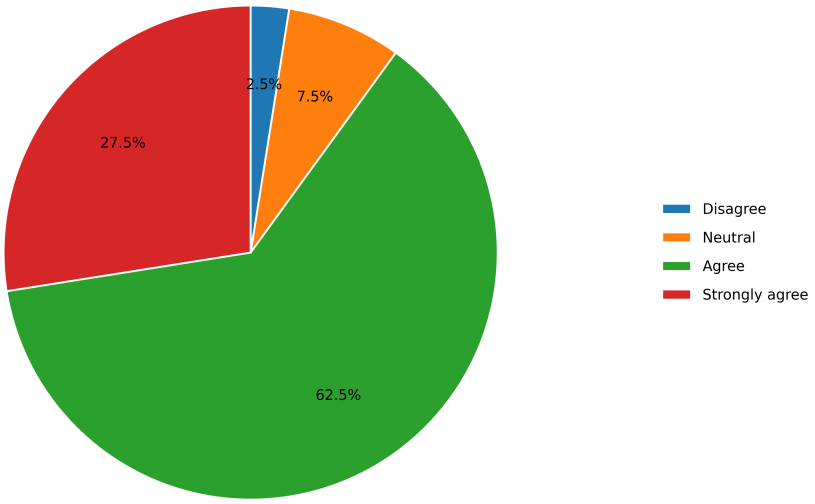
Open-ended responses also highlighted concerns about the implementation and effectiveness of current policies, including perceptions that policy implementation can be slow and that industry uptake remains voluntary in some areas. This qualitative evidence provides additional context for the mixed views regarding the effectiveness of current policies.

Figure 15: Current Policies in New Zealand Are Effective in Encouraging the Use of Sustainable Materials



Need for More Government Support: A total of 90% of respondents agreed that more government support and incentives are needed to increase the adoption of sustainable materials, comprising 62.5% who agreed and 27.5% who strongly agreed. A further 7.5% were neutral, while 2.5% disagreed. These results indicate strong respondent support for additional government support and incentives.

Figure 16: More Government Support and Incentives Are Needed to Increase Adoption of Sustainable Materials



Policy Recommendations (Qualitative Insights): Open-ended responses identified several areas where respondents considered that further government action could support sustainable-material adoption. These suggestions were grouped into five broad areas: **economic incentives, regulatory measures, market development, knowledge and training, and leadership in public projects.**

Economic Incentives: Respondents suggested several financial mechanisms to reduce the cost barrier associated with sustainable materials. These included tax credits or deductions for projects using certified sustainable materials, carbon taxes or levies on higher-carbon materials, subsidies or grants for projects using innovative materials, and expanded green-loan programmes. These suggestions reflect respondents' views that financial mechanisms could help address the higher upfront costs associated with sustainable-material adoption.

Regulatory Measures: Respondents suggested strengthening sustainability requirements within the New Zealand Building Code, including potential requirements relating to embodied carbon and recycled content. Some respondents also suggested restricting higher-impact materials where suitable alternatives are available and improving approval pathways for innovative materials. These suggestions reflect respondents' views that clearer regulatory requirements and more efficient approval processes could support sustainable-material adoption.

Market Development: Respondents suggested that government could support the development of local sustainable-material manufacturing and increase supplier competition. Suggestions included supporting domestic production of sustainable building products and encouraging greater supplier participation in the market. These suggestions reflect respondents' views that increased local production and supplier availability could help address supply-chain constraints associated with sustainable materials.

Knowledge and Training: Respondents suggested greater investment in education, professional development, and industry training related to sustainable construction and materials. Suggestions included integrating sustainable-construction content into trade apprenticeships, supporting professional development courses, and providing sustainability-

focused training for construction professionals. These suggestions reflect respondents' views that improving industry knowledge and skills could help address knowledge-related barriers to sustainable-material adoption.

Leadership in Public Projects: Some respondents suggested that government could lead by example by incorporating higher sustainability criteria into public construction projects, including schools, government buildings, and state housing. Respondents indicated that public projects could provide opportunities to demonstrate sustainable-material applications and support greater industry exposure to these approaches. These suggestions reflect respondents' views that government-led projects could contribute to the wider adoption of sustainable materials.

CONCLUSION

This research examined the perceived barriers and enablers influencing the adoption of sustainable materials in New Zealand residential construction. Using a mixed-methods approach combining a targeted survey of 40 construction professionals with relevant literature and policy evidence. The study provides an exploratory snapshot of respondents' perceptions in 2025.The findings highlight financial, knowledge, supply-chain, client, and policy factors that respondents associate with sustainable-material adoption.

The findings indicate that **high upfront cost is a prominent perceived barrier** to sustainable-material adoption, while respondents also recognised the potential for long-term cost savings. A total of 82.5% identified high upfront costs as a major barrier, while 87.5% agreed that sustainable materials can provide long-term cost savings. This indicates a perceived tension between immediate project costs and longer-term economic benefits.

Knowledge and supply-chain constraints were also identified as important barriers, with 80% of respondents agreeing that lack of awareness or understanding hinders adoption and 80% agreeing that limited supplier availability affects the use of sustainable materials. Respondents also identified training and education as a potential enabler, with 72.5% agreeing that these could increase the use of sustainable materials. Client requirements were also perceived as an important influence on material selection.

Government policy and support were prominent in the findings. A total of 82.5% of respondents agreed that government policies and incentives play a significant role in promoting sustainable materials, while 90% agreed that additional government support and incentives are needed. However, views on the effectiveness of current policies were more mixed, with 62.5% agreeing that existing policies are effective and 25% remaining neutral. Overall, the findings suggest that sustainable-material adoption is influenced by interconnected financial, knowledge, supply-chain, market, and policy factors.

The study contributes to understanding perceptions of sustainable-material adoption in New Zealand residential construction by bringing these factors together within a single exploratory study. The findings suggest that addressing these factors in isolation may be insufficient. In particular, reducing upfront cost pressures, improving industry knowledge and material availability, and strengthening policy support may help create more favourable conditions for wider adoption.

Limitations and Future Research

The study has several limitations. The sample was relatively small, with **40 respondents, and was predominantly Auckland-based, with 95% of respondents located in the Auckland region.** This geographic concentration limits

the extent to which the findings can be generalised to the wider New Zealand construction sector. The sample also included a strong representation of particular professional groups, particularly Project Managers, which should be considered when interpreting the findings

The purposive, non-probability sampling approach further means that the findings should be interpreted as **exploratory perceptions rather than statistically representative estimates.** Future research could use larger and more geographically diverse samples to examine whether perceptions differ across regions and professional groups. Longitudinal research could also examine how industry perceptions change as sustainability policies, technologies, and market conditions evolve.

Overall, the study indicates that sustainable-material adoption in New Zealand residential construction is influenced by interconnected financial, knowledge, supply-chain, market, and policy factors. Addressing these factors together may create more favourable conditions for wider adoption. The findings provide an exploratory evidence base for further research and for consideration by construction practitioners, industry organisations, and policymakers seeking to support sustainable-material integration.

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