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A policy-to-practice translation framework for sustainable construction decision-making in Australia

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Robert Haigh and Yi Lu

College of Sport, Health and Engineering, Institute for Sustainable Industries and Liveable Cities, Victoria University, Melbourne, Australia

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Abstract

Purpose – This study examines how government sustainability and circular economy requirements are translated into project-level decision-making within the Australian construction industry, addressing the persistent gap between policy ambition and implementation.

Design/methodology/approach – A comparative review and policy–practice synthesis approach was adopted, integrating policy documents, peer-reviewed literature and industry reports. A structured coding framework was used to analyse sources across five domains: policy type, translation mechanism, lifecycle stage, decision impact and implementation constraint, with cross-case comparison undertaken across Federal, New South Wales and Victorian contexts.

Findings – The findings show that sustainability outcomes are not determined by policy instruments alone but by the mechanisms through which policy is translated into actionable decision rules. Procurement was identified as the most influential translation mechanism within the reviewed policy and literature sources. Early planning and design decisions were found to exert disproportionate influence on lifecycle carbon and material circularity outcomes. However, industry fragmentation, capability variability and supply chain constraints remain major implementation barriers.

Research limitations/implications – The study is based on comparative synthesis rather than project-level empirical validation. Future research should test the proposed framework across different project types and international policy contexts.

Practical implications – The findings highlight the need for policymakers to align sustainability instruments with enforceable lifecycle decision points and for industry stakeholders to strengthen capability in carbon assessment, circular procurement, and compliance delivery.

Originality/value – The study proposes a novel policy-to-practice translation framework that reconceptualises sustainable construction implementation as a multi-layered socio-technical process and maps the sector's transition from reporting-based governance toward performance-based regulation.

Keywords Sustainable construction, Circular economy, Embodied carbon, Policy implementation, Construction decision-making, Sustainable procurement, Built environment

Paper type General review

1. Introduction

The built environment is one of the most resource-intensive and environmentally impactful sectors globally, contributing substantially to greenhouse gas (GHG) emissions, material consumption, and waste generation (Dräger and Letmathe, 2022). Recent estimates indicate that buildings and infrastructure account for approximately 37–40% of global energy-related carbon emissions when both operational and embodied sources are considered (EcoChain, 2025). Construction activities are also responsible for significant resource depletion and waste generation across material supply chains (Hasselsteen *et al.*, 2025). Within Australia, infrastructure and



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buildings contribute approximately 57% of national carbon emissions when operational and embodied emissions are combined ([Infrastructure Australia, 2024](#)). With embodied carbon from construction activities accounting for around 10% of total emissions. These figures highlight that the construction sector is not merely a contributor to environmental degradation, but a central domain for achieving national and global sustainability targets. Beyond emissions, the construction industry is intrinsically linked to linear patterns of resource extraction and waste generation ([Abidi et al., 2026](#); [Haigh, 2024](#)). Construction and demolition activities represent a dominant share of national waste streams, while conventional practices continue to rely on extract–use–dispose material flows that undermine long-term resource security ([Ajayi et al., 2015](#)). This linearity directly conflicts with circular economy principles, which emphasise material retention, reuse, and regeneration. As such, the built environment is increasingly recognised as a critical intervention point for both carbon reduction and material circularity strategies.

Australia provides a valuable context for examining sustainability implementation because responsibility for sustainability governance is distributed across federal, state, and local jurisdictions. This multi-level governance structure has generated diverse approaches to embodied carbon, circular economy, procurement, and sustainability reporting. New South Wales and Victoria have emerged as leading jurisdictions through embodied carbon reporting requirements and circular procurement initiatives, respectively. As a result, Australia provides a useful case for examining how sustainability objectives are translated into project-level decision-making within a fragmented policy environment. Despite increasing policy attention, implementation of sustainability and circular economy principles remains inconsistent across construction projects. The project-based and fragmented nature of the construction industry means that sustainability outcomes are shaped by a sequence of decisions made across planning, design, procurement, and construction stages ([Haigh, 2026](#)). Consequently, policy objectives do not automatically translate into project-level outcomes. Instead, their effectiveness depends on how sustainability requirements are interpreted, operationalised, and embedded within construction decision-making processes.

Although sustainability and circular economy principles have attracted significant attention within construction research, the literature has largely evolved along several distinct streams. One major stream focuses on identifying barriers and drivers influencing sustainable construction and circular economy adoption, highlighting factors such as regulatory uncertainty, cost, stakeholder engagement, organisational capability, and market readiness ([Shoosharian et al., 2025](#); [Martek et al., 2019b](#); [Mhatre et al., 2023](#); [Abdulai et al., 2024](#)). A second stream examines circular economy strategies and implementation pathways, including material reuse, design for disassembly, material passports, and circularity assessment frameworks ([Gurusinghe et al., 2025](#); [Li et al., 2025](#); [Minunno et al., 2020](#); [Senarathne et al., 2025](#)). A third body of work investigates sustainable procurement and supply-chain interventions as mechanisms for influencing environmental performance and market transformation ([Ruparathna and Hewage, 2015](#); [Ahmed et al., 2024](#); [Ajayi et al., 2017](#)). More recently, researchers have explored embodied carbon assessment, life-cycle thinking, sustainability governance, and regulatory approaches to construction decarbonisation ([Lu et al., 2022](#); [Amarasinghe et al., 2024](#); [Zhang et al., 2026](#); [Craft et al., 2024](#)). These studies have significantly advanced understanding of sustainability challenges, policy instruments, and implementation strategies within the built environment. However, the majority focus on what sustainability policies require, the barriers affecting adoption, or the tools available to support implementation. Comparatively, less attention has been directed towards understanding how sustainability requirements are translated into project-level decisions across planning, design, procurement, and construction stages. As a result, there remains limited understanding of the mechanisms through which policy ambitions are operationalised within construction decision-making processes and ultimately influence project outcomes. To position the contribution of this study within the broader sustainable construction literature, the major research streams relevant to sustainability implementation

were synthesised and categorised, as shown in [Table 1](#). This gap is particularly significant in the context of the ongoing shift from voluntary sustainability initiatives toward more structured and measurable approaches to environmental performance. This issue is especially relevant in Australia, where sustainability requirements are emerging through multiple policy pathways rather than a single national regulatory framework. New South Wales has introduced embodied carbon reporting through the planning system, Victoria has embedded recycled-content requirements within major infrastructure procurement, and the Commonwealth has introduced embodied carbon reporting obligations through the Environmentally Sustainable Procurement Policy ([NSW Government Department of Planning Housing and Infrastructure, 2026](#); [Victoria State Government, 2026](#); [Australia Government Department Of Finance, 2025](#)). While these initiatives demonstrate substantial policy progress, they also highlight the absence of a consistent understanding of how sustainability requirements are operationalised across the construction lifecycle. Examining Australia therefore provides an opportunity to investigate how diverse policy instruments are translated into practice and to identify lessons that may be transferable to other jurisdictions pursuing similar sustainability transitions.

The objective of this study is to examine how sustainability and circular economy requirements are translated into project-level decision-making within the Australian construction industry and to develop a conceptual framework explaining this process. To achieve this objective, the study addresses the following research questions:

- RQ1. What sustainability and circular economy policy mechanisms currently influence construction decision-making within the Australian context?
- RQ2. Through what mechanisms are sustainability policy requirements translated into project-level decisions across planning, design, procurement, and construction stages?
- RQ3. What organisational, technical, and institutional constraints influence the effectiveness of policy implementation within construction projects?
- RQ4. How can the relationships between policy drivers, translation mechanisms, lifecycle decision points, and implementation outcomes be conceptualised within a policy-to-practice translation framework?

2. Research design and methodology

This study adopts a comparative review and policy–practice synthesis approach to examine how sustainability and circular economy requirements are translated into construction decision-making within the Australian context. This approach is particularly suited to

Table 1. Dominant research streams in sustainable construction literature

Research stream	Focus	Limitation	References
Barriers and drivers	Adoption challenges and enablers	Limited focus on implementation	Martek et al. (2019a, b) , Mhatre et al. (2023) , Abdulai et al. (2026)
Circular economy strategies	Reuse, recycling, design for disassembly	Often conceptual rather than decision focused	Gurusinghe et al. (2025) , Li et al. (2025) , Minunno et al. (2020)
Sustainable procurement	Supply chain and tender mechanisms	Focused on procurement rather than lifecycle integration	Ruparathna and Hewage (2015) , Ahmed et al. (2024)
Sustainability governance	Policy instruments and regulation	Limited examination of project level translation	Lu et al. (2022) , Amarasinghe et al. (2024)

emerging and interdisciplinary domains, where heterogeneous policy instruments, fragmented industry practices, and evolving analytical frameworks limit the applicability of strictly systematic review protocols. It prioritises analytical depth and conceptual integration over exhaustive coverage, consistent with comparative interpretive review methodologies in socio-technical systems research. The analysis integrates three complementary evidence streams: (1) policy and regulatory documents, including federal legislation, national frameworks, and state-level planning and procurement policies; (2) academic literature focussing on embodied carbon, circular economy, sustainable procurement, and construction decision-making; and (3) industry and institutional reports providing empirical and practice-based insights.

New South Wales and Victoria were selected as the primary state-level case contexts because they represent the most mature and operationalised examples of sustainability policy integration within the Australian construction sector. Both jurisdictions have moved beyond high-level sustainability strategies and have implemented mechanisms that directly influence project-level decision-making. New South Wales was selected due to the introduction of embodied carbon reporting requirements through the Sustainable Buildings State Environmental Planning Policy (SEPP), which embeds sustainability considerations within the planning and approvals process. Victoria was selected because of its Recycled First Policy, which incorporates circular economy objectives directly into public infrastructure procurement and contractual requirements. Together, these jurisdictions provide complementary examples of regulatory and procurement-based approaches to sustainability implementation, making them particularly suitable for examining how policy objectives are translated into construction practice. While other Australian states and territories have established sustainability and circular economy strategies, their requirements are generally less prescriptive or less directly integrated into construction decision-making processes. The methodological process adopted in this study is illustrated in [Figure 1](#). The figure outlines the progression from source identification and structured coding through comparative policy analysis and cross-case synthesis to the development of the Policy-to-Practice Translation Framework.

2.1 Source selection and inclusion criteria

The source selection process was designed to capture documents directly relevant to the translation of sustainability and circular economy requirements into construction decision-making. Database searches included Scopus, Web of Science, and ScienceDirect, government websites, and industry publications. Representative search strings included combinations of: (“construction” OR “built environment”) AND (“sustainability” OR “circular economy” OR “embodied carbon”) AND (“policy” OR “regulation” OR “procurement” OR “governance”) AND (“implementation” OR “decision-making” OR “project delivery”). Following preliminary screening, documents were assessed for relevance against predefined inclusion and exclusion criteria. Sources were included if they: (1) addressed sustainability, circular economy, embodied carbon, sustainable procurement, or construction decision-making; (2) examined policy instruments, regulatory frameworks, implementation mechanisms, or project-level applications; (3) related to the building and construction sector; and (4) were published between 2015 and 2026, except where earlier seminal works were considered necessary for contextual understanding. Sources were excluded if they: (1) focused exclusively on technical material performance without policy or implementation relevance; (2) addressed sustainability issues outside the built environment; (3) lacked sufficient methodological or institutional credibility; or (4) duplicated findings already represented within the dataset. To ensure analytical robustness, all sources were subjected to a quality screening process prior to inclusion.

Academic literature was assessed according to relevance, methodological transparency, publication in peer-reviewed journals, and contribution to sustainability policy or construction decision-making research. Policy documents were assessed based on their regulatory

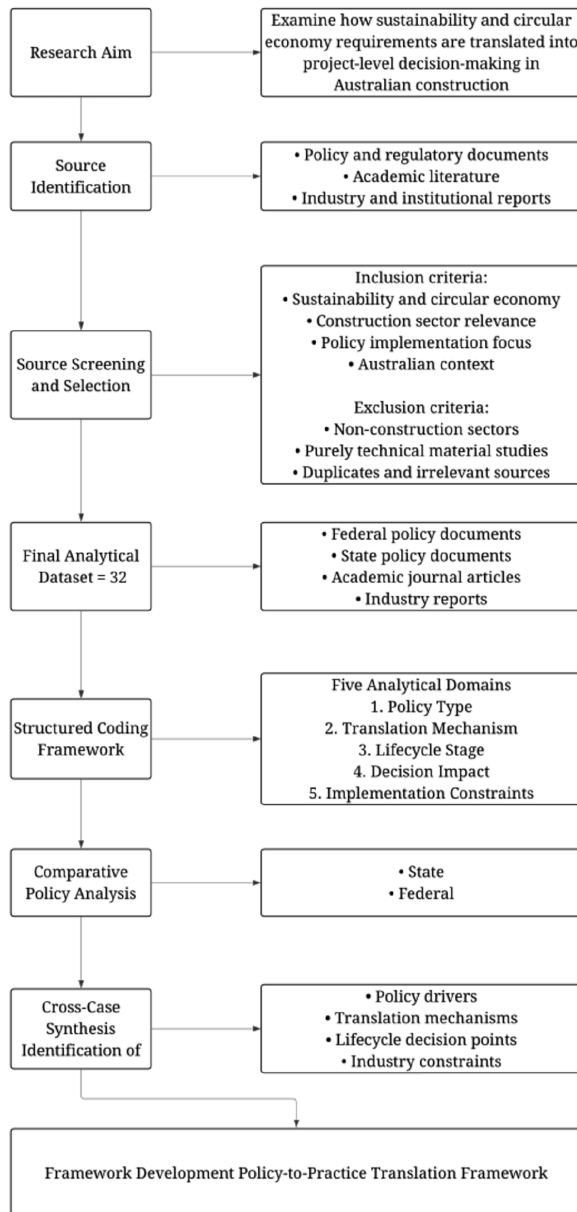


Figure 1. Research methodology

significance, implementation relevance, and direct applicability to the Australian construction sector. Industry and institutional reports were included if they were produced by recognised government agencies, industry organisations, or professional bodies with demonstrated expertise in sustainability and construction policy. This approach ensured that the final dataset was derived from credible and authoritative sources while remaining appropriate for a

comparative review and policy-synthesis methodology. The final dataset comprised 34 sources following relevance screening and eligibility assessment. The objective of the study was not to achieve exhaustive coverage of all sustainability literature, but rather to identify sources directly relevant to policy implementation and construction decision-making. Sources were therefore selected based on conceptual relevance to the research questions and their ability to provide insight into policy translation mechanisms, lifecycle decision processes, and implementation constraints.

A systematic review methodology was not adopted because the objective of the study was to develop a conceptual understanding of policy translation rather than synthesise evidence relating to a narrowly defined empirical question. The study integrates policy documents, academic literature, and industry reports and therefore adopts a comparative review and policy-synthesis approach consistent with conceptual framework development research. The analytical process involved three stages. First, sources were thematically coded across five domains: policy instruments, translation mechanisms, lifecycle decision stages, and implementation constraints. Second, cross-case comparison was conducted across federal and state contexts, with particular focus on New South Wales and Victoria, as well as across regulatory and procurement-based mechanisms. Third, insights from the synthesis were integrated into a conceptual policy-to-practice translation framework capturing the relationships between policy drivers, translation mechanisms, lifecycle decision-making, industry constraints, and implementation outcomes. [Table 2](#) summarises the composition of the final analytical dataset used in this study. The inclusion of multiple evidence types enabled a comparative policy-synthesis approach capable of examining how sustainability requirements are translated into project-level actions across the Australian construction sector. The 34 sources presented in [Table 2](#) represent the core analytical dataset subjected to structured coding. Additional literature was used to provide contextual support, theoretical framing, and discussion but was not included within the coded dataset.

2.2 Development of the coding framework

The coding framework was developed through an iterative review of sustainability governance, circular economy, procurement, and construction management literature, combined with preliminary examination of Australian policy and regulatory documents. The objective was to establish a structured analytical tool capable of identifying not only the content of sustainability policies but also the mechanisms through which policy requirements are translated into project-level decisions. An initial set of coding categories was derived from recurring themes identified within the literature, including policy instruments, implementation mechanisms, lifecycle decision-making, and sustainability outcomes. These categories were subsequently refined through pilot coding of selected policy documents and industry reports to ensure relevance to the Australian construction context. The final framework comprised five analytical domains: policy type, translation mechanism, lifecycle stage, decision impact, and implementation constraints. The coding process involved systematically reviewing each source and assigning relevant codes across the five domains. Coded information was then compared across source types and jurisdictions to identify recurring patterns, relationships,

Table 2. Composition of the analytical dataset

Source category	Number
Federal policy and regulatory documents	6
State policy and regulatory documents	8
Academic journal articles	14
Industry and institutional reports	6
Total	34

and implementation pathways. This comparative synthesis enabled the development of the Policy-to-Practice Translation Framework by revealing how sustainability requirements move from policy objectives to project-level decisions and outcomes.

3. Australian construction industry sustainability requirements

Australia's construction industry is no longer operating in a purely voluntary sustainability environment. Its regulatory and market context is now being shaped by a layered policy architecture that includes legislated national emissions targets, mandatory building code provisions, state planning controls, and increasingly explicit public procurement requirements for embodied carbon and recycled content ([Australia Government, Department of climate change, 2026](#)). Collectively, these instruments are shifting sustainability from a discretionary value-adding feature toward a compliance, reporting, and competitive-delivery requirement within the Australian construction sector. At the federal level, the policy foundation is Australia's legislated commitment to reduce GHG emissions by 43% below 2005 levels by 2030 and to reach net zero by 2050 under the Climate Change Act 2022 ([Climate Change Authority, 2025](#)). Although the Act does not prescribe construction-specific obligations, it materially alters the strategic expectations placed on the built environment because construction, infrastructure delivery, and building operation are indispensable to achieving economy-wide decarbonisation. The Climate Change Authority has emphasised that successful policy implementation across sectors is essential if Australia is to meet these targets, while its built environment pathway work identifies embodied carbon as an increasingly important policy frontier as grid decarbonisation reduces the relative weight of operational emissions ([Climate Change Authority, 2025](#)). This national decarbonisation context matters because the built environment is not a marginal emissions source. Infrastructure Australia reported that Australian infrastructure and buildings were projected to contribute 57% of national carbon emissions in 2023 when operational and embodied sources are considered together, while embodied carbon from construction activity alone represented around 10% of national emissions ([Infrastructure Australia, 2024](#); Its 2024 projections further estimated that construction activity would generate between 37 and 64 million tonnes of carbon dioxide equivalent (Mt CO₂-e) of upfront embodied carbon annually through 2026–27, with around 23% of those emissions potentially abated using practical decarbonisation strategies already available ([Infrastructure Australia, 2024](#)). These findings are significant as they reposition construction materials, design choices, procurement settings, and demolition/reuse decisions as matters of national climate policy rather than project-level sustainability preferences.

3.1 Policy, regulation and implementation

The first mandatory national sustainability layer affecting construction is the National Construction Code (NCC) ([Australian Building Codes Board, 2025](#)). The NCC explicitly states that it sets the minimum required level for the safety, health, amenity, accessibility and sustainability of buildings in Australia. In practice, the Code's sustainability role has historically focused more strongly on operational performance than on material circularity or whole-life carbon ([Armstrong et al., 2017](#)). For residential buildings, NCC 2022 strengthened energy efficiency requirements through Part H6, which requires buildings to reduce energy consumption, reduce GHG emissions resulting from building energy use and energy source, and improve occupant health and amenity under increasingly extreme climatic conditions ([Australian Building Codes Board, 2025](#)). This represents a significant shift for the construction industry as sustainability compliance is no longer confined to rating tools or client aspirations but is embedded in the technical rules that govern design documentation, approvals, product selection, and construction detailing. However, the current Australian regulatory trajectory also reveals a critical structural shift with the move from operational

efficiency regulation toward embodied carbon disclosure and reduction. Recent literature indicates that this transition is now central to construction decarbonisation. [Amarasinghe et al. \(2024\)](#) argue that while operational carbon has historically dominated building policy, embodied carbon is becoming increasingly significant. Therefore, operational carbon requires policy, procurement, digital measurement, organisational capability, and cross-disciplinary coordination to address this effectively ([Elghaish et al., 2024](#)).

One of the strongest examples of this shift is the Commonwealth Environmentally Sustainable Procurement (ESP) Policy ([Australia Government Department Of Finance, 2025](#)). From 1 July 2024, construction services procurements at or above AUD 7.5 million are within scope of the policy ([Australia Government Department Of Finance, 2025](#)). The policy is explicitly framed as supporting value for money and Australia's transition to a net zero and circular economy. This is a significant development for the Australian construction industry because it turns sustainability from a soft tender differentiator into a public procurement expectation for major federally procured construction work. In effect, contractors, consultants, and suppliers seeking Commonwealth work must now demonstrate environmentally sustainable performance through approach-to-market and contractual mechanisms, creating a direct policy signal into market behaviour. The importance of this procurement shift is reinforced by Infrastructure Australia, which notes that as of July 2024 suppliers on construction services procurements over AUD 7.5 million are required to measure and report on embodied carbon reduction under the ESP policy ([Infrastructure Australia, 2024](#)). This is especially consequential because procurement is where policy most directly influences real construction practice. Once sustainability criteria are embedded in tender clauses, contract conditions, performance reporting, and material selection requirements, they begin to affect design-stage optioneering, quantity surveying assumptions, subcontractor engagement, and supply chain evidence requirements ([Ahmed et al., 2024](#); [Ruparathna and Hewage, 2015](#); [Dehnavi and Mokhtari, 2026](#)). This ensures public procurement converts high-level climate ambition into operational decision rules. The National Sustainable Procurement in Infrastructure Guideline further strengthens this direction by advising transport agencies and public infrastructure bodies to reduce embodied emissions during procurement and project delivery ([Australia Government Department of Infrastructure, 2025](#)). The guideline identifies transport infrastructure delivery and construction as contributing approximately 3% of Australia's total GHG emissions and emphasise the need to integrate decarbonisation into engineering practices, technical requirements, and procurement frameworks. It is important to note that this confirms that Australia is moving toward a more standardised policy logic in which sustainability performance is expected to be specified, measured and compared across projects, rather than treated as an ad hoc innovation agenda.

The national policy landscape demonstrates that sustainability requirements are increasingly being embedded within construction governance through a combination of reporting obligations, procurement frameworks, and planning instruments. Importantly, these mechanisms do not directly determine project outcomes. Rather, they establish the conditions under which sustainability considerations enter construction decision-making processes. This suggests that the effectiveness of policy depends less on policy ambition itself and more on the mechanisms through which requirements are translated into actionable project decisions.

3.2 State-wide implementation

Among Australian jurisdictions, New South Wales and Victoria provide particularly relevant case examples because they have implemented some of the most advanced and operationally integrated sustainability requirements affecting construction projects. These jurisdictions therefore serve as illustrative policy contexts for examining how sustainability objectives are translated into project-level decisions through planning and procurement mechanisms. The New South Wales (NSW) government currently provides the clearest example of planning-system intervention into embodied carbon ([NSW Government Planning, 2025](#)). The State

Environmental Planning Policy (Sustainable Buildings) 2022, explicitly aims to encourage sustainable building design and delivery, ensure consistent sustainability assessment, record accurate performance data, and monitor the embodied emissions of materials used in construction (NSW Government Department of Planning, 2023). The associated regulatory framework requires non-residential development applications to disclose the amount of embodied emissions attributable to the development and to describe the use of low-emissions construction technologies (NSW Government Department of Planning Housing and Infrastructure, 2026). NSW guidance further confirms that from 1 October 2023 new non-residential developments covered by the policy must report embodied emissions using the prescribed materials form, with the current focus on disclosure and data capture rather than numerical embodied carbon caps (Planning, 2025). The analytical significance of the NSW model is that it intervenes upstream, at the planning and approvals stage, rather than waiting until procurement or voluntary certification. This matters because many of the most important determinants of sustainability outcomes in construction are locked in early. This is evident in the structural system choice, facade strategy, building size and form, demolition versus reuse, and material intensity. By requiring disclosure of embodied emissions before construction begins, NSW is normalising a new compliance expectation that carbon information is part of the evidentiary base for development, not merely a post hoc sustainability report. This is consistent with recent literature indicating that mandatory reporting is a necessary precursor to broader embodied carbon reduction across the sector (Duan *et al.*, 2025).

The NSW government also illustrates the limits of the current policy moment. While embodied emissions reporting is mandatory, targets are not yet imposed across the board (NABERS, 2024). This means the policy is currently stronger on measurement and transparency than on performance restriction. Australia's construction sustainability framework is evolving from a first-generation reporting regime toward a likely second-generation regime of benchmarks, thresholds, and comparative accountability (Australian Sustainable Built Environment Council, 2025). The policy literature suggests this intermediate stage is essential, because data standardisation and industry familiarity are needed before regulators can credibly impose tightening carbon limits. The state of Victoria provides a complementary but distinct model through its Recycled First Policy, which is more explicitly circular-economy oriented than carbon-accounting oriented (Victoria State Government Victorias Big Build, 2025). Since 1 March 2020, tenderers on major Victorian transport infrastructure projects have been required to demonstrate how they will optimise the use of recycled and reused materials within allowable standards and specifications. Additionally, from 2022 the policy extended to Department of Transport operational and maintenance projects meeting threshold criteria (Victoria State Government Victorias Big Build, 2026). The policy is mandatory for projects within scope and requires Recycled First Plans, reporting on product types and volumes, and contractual integration of recycled content commitments. This is a highly relevant sustainability mandate because it directly links public infrastructure delivery to market demand for secondary materials and circular supply chains. Victoria's approach is notable because it operationalises circular economy principles through procurement and contract administration rather than through abstract strategy language. The policy requires bidders to explain not only intended recycled-content use but also limiting factors such as price, availability, suitability or durability where opportunities are constrained. This generates compliance pressure that forces the supply chain to consider recycled-content substitution while also surfacing the real barriers preventing greater uptake. Victoria's policy has substantially increased recycled and reused material use across major projects and diverted large volumes of waste from landfill. This has been shown with 2.5 Mt of waste diverted from landfill and 3.1 Mt of recycled and reused materials used in road projects (Victoria State Government Victorias Big Build, 2023).

The detailed examples from NSW and Victoria governments demonstrate their advanced regulatory and procurement-based sustainability mechanisms, particularly in relation to embodied carbon reporting and circular material use. Other Australian states and territories,

including Queensland, South Australia, and Western Australia, have also established sustainability and circular economy strategies. However, these are generally less prescriptive in their integration into construction planning systems and procurement frameworks. As a result, NSW and Victoria provide critical case contexts for examining the translation of policy into practice, while the broader Australian landscape reflects a more heterogeneous and evolving policy environment. Recent journal research reinforces the importance of these policy directions while also showing that current frameworks remain incomplete. [Shooshtarian et al. \(2025\)](#) found that most respondents considered existing policy frameworks insufficient to support the use of recycled content in Australian construction. This is despite identifying sustainable procurement, extended producer responsibility, and carbon pricing as among the most influential policy levers for better uptake. Likewise, [Gurusinghe et al. \(2025\)](#) emphasise that circular construction in Australia requires stronger policy alignment, incentives, stakeholder collaboration, and sector-specific guidance. This is if strategies such as design for deconstruction, reuse, stock management and off-site construction are to move beyond isolated examples into routine practice. Together, these studies suggest that Australia's sustainability requirements are strengthening, but they are not yet coherent enough to guarantee large-scale circular implementation across the industry. The NSW case illustrates the role of planning-system interventions as a policy translation mechanism. By requiring embodied carbon assessment during project planning and approval processes, sustainability considerations are introduced at a stage where decisions regarding building form, structural systems, and material selection remain flexible. The analysis therefore highlights the importance of lifecycle timing, demonstrating how planning-based mechanisms can influence early-stage decision-making and potentially reduce future carbon lock-in.

3.3 Circular economy framework

The Australian Government's Circular Economy Framework provides the broader strategic backdrop to these developments ([Australia Government. Department of climate change, 2024](#)). Released in 2024, the framework commits Australia to doubling national circularity by 2035 and identifies the circular economy as central to reducing waste, keeping materials in use, and regenerating natural systems. Importantly for construction, the framework states that the Commonwealth ESP Policy will help drive demand for recycled content and circular goods and services in the construction sector. This indicates that circularity is becoming embedded in the economic and procurement logic of government-led project delivery. These policy developments show that the Australian construction industry now faces sustainability requirements across three escalating tiers. The first tier is minimum technical compliance, led by the NCC and related state planning tools governing energy, thermal performance, and building sustainability. The second tier is mandatory disclosure and reporting, particularly for embodied emissions in jurisdictions such as NSW and for major public procurement under the Commonwealth and NSW embodied carbon frameworks. The third tier is market-shaping procurement intervention, exemplified by the Commonwealth ESP policy and Victoria's Recycled First policy, where sustainability and circularity are explicitly used to influence design, materials selection, tender competitiveness and supply-chain behaviour.

From a critical perspective, the major challenge is no longer the absence of sustainability policy, but rather the fragmented translation of policy into consistent construction practice. Australia has a growing body of code provisions, planning obligations, procurement policies and strategic frameworks, yet these instruments still vary by jurisdiction, asset class, project size, and lifecycle stage ([Climate Change Authority, 2024](#)). Reporting methods, thresholds, approved tools, and required evidence are not yet fully harmonised. This fragmentation creates compliance uncertainty and risks uneven capability development across the sector. It also explains why recent literature continues to call for national consistency, clearer policy mixes, stronger incentives, better carbon data, and more explicit procurement integration ([Teng et al.,](#)

2023; Marcos-Martinez *et al.*, 2026; Robati *et al.*, 2019). Accordingly, the most important implication for research is that Australian construction sustainability should no longer be analysed as a question of whether policy exists, but as a question of how effectively policy instruments are translated into project-level decisions and practices. The central issue is now implementation and how emissions targets, circular economy ambitions, recycled-content requirements, and embodied carbon reporting obligations are being interpreted by developers, consultants, contractors, certifiers and suppliers. The Victorian approach demonstrates a different translation pathway in which sustainability objectives are embedded through procurement and contractual requirements rather than planning regulation. By linking recycled-content targets to infrastructure procurement, sustainability requirements become integrated into supplier selection, material sourcing, and project delivery processes. This highlights procurement as a key mechanism through which policy objectives can be operationalised and enforced throughout the construction lifecycle.

3.4 Sustainability rating systems

Sustainable building rating systems play an important role in tracking decarbonisation and circularity progress within the built environment and contribute to broader net-zero objectives (Lu *et al.*, 2025). In Australia, the Building Sustainability Index (BASIX), the National Australian Built Environment Rating System (NABERS), and Green Star are the three key sustainable building rating systems considering embodied carbon calculations into their scope (Craft *et al.*, 2024; Lucas and Löschke, 2024). BASIX is a mandatory policy requirement for newly built residential development and major renovations in NSW. It mandates the calculation of embodied carbon from October 2023 onwards. NABERS ratings are mandatory for commercial buildings exceeding 1,000 m² at the point of sale or lease. While the scheme currently focusses on operational emissions, it is undergoing expansion to include embodied carbon metrics. Similarly, the Green Building Council of Australia integrates embodied carbon considerations within its Green Star rating tool, particularly through the Design and As Built categories, which promote the selection of low-impact construction materials. In relation to circular economy principles, NABERS and Green Star are particularly relevant in supporting the implementation of circular design strategies (NSW Government Treasury, 2023). For instance, the NABERS Waste tool evaluates building performance in managing operational waste, including waste generation, recycling practices, and aspects of supply chain management. It is designed to accommodate different building types and provides performance data and benchmarking insights to support improvements in waste management practices. Consequently, strategies such as waste minimisation, material reuse, and improved resource recovery directly contribute to enhanced performance under the NABERS Waste framework. The Green Star Buildings rating tool also incorporates criteria that promote material efficiency, the reuse of existing assets and building components, and the selection of products with recycled content.

3.5 Material circularity

Material circularity is a central component of the circular economy in the built environment, aiming to retain material value through reuse, recycling, and recovery across the building lifecycle (Tinarwo *et al.*, 2023; Haigh, 2025). Achieving high levels of material circularity requires not only technical solutions but also systemic changes in how materials are designed, tracked, and managed. However, the construction industry presents unique challenges to the implementation of material circularity. Unlike many manufacturing sectors, buildings are long-lived assets, limiting the applicability of business models such as manufacturer take-back schemes. In addition, the industry is highly fragmented, with projects typically delivered in isolation and involving multiple stakeholders with differing responsibilities. These characteristics hinder the development of consistent material flows and reduce opportunities for circular practices (Luscuere, 2018). To address these challenges, the

availability and management of material information have been identified as critical enablers (Senarathne *et al.*, 2025). Material passports have thus emerged as a promising tool in this regard. A material passport is a digital record that documents the properties, composition, and lifecycle information of materials and components within a building (Shooshtarian *et al.*, 2019; Haigh *et al.*, 2026). Such policy initiatives are beginning to reflect this potential. For example, building upon the NSW Waste and Sustainable Materials Strategy 2041, the NSW Government Treasury (2023) has proposed the development of material databases, such as material passports, to support circular design and increase the reuse and recycling of construction materials.

In addition, strategies such as designing for disassembly are gaining traction as practical approaches to enhance material circularity. It enables reuse practices to be optimised at the end of the buildings' useful life, thereby minimising demolition waste. By incorporating deconstruction considerations at the design stage, buildings can be more easily dismantled at the end of their service life, enabling greater material recovery and reducing demolition waste. Demonstration projects, such as the Legacy Living Lab, provide early evidence of the feasibility of such reuse-oriented strategies in Australian projects (Minunno *et al.*, 2020). The use of products with recycled content (PwRC) is another important pathway to advancing material circularity (Shooshtarian *et al.*, 2025). Increasing the uptake of such materials in construction can significantly reduce reliance on virgin resources and lower embodied environmental impacts. Effective utilisation of PwRC often depends on supportive policy frameworks. In Australia, the National Waste Policy (2018) encourages the use of PwRC and some of the states set recycling rate targets for construction and demolition waste materials. For example, the Queensland Waste Management and Resource Recovery Strategy outlines clear strategic priorities for transitioning to a circular economy, including a target to achieve a 75% recovery rate for construction and demolition waste by 2025 (Queensland Government, 2019). Despite increasing policy support, implementation of material circularity remains constrained by economic, technical, and organisational barriers (Purushothaman and Aguas, 2025). Common challenges include limited financial incentives, insufficient material information, fragmented stakeholder responsibilities, and the absence of mature material exchange platforms. These constraints reinforce the importance of policy mechanisms capable of translating circular economy objectives into project-level decision-making practices.

3.6 Embodied carbon implementation

Reducing embodied carbon in the construction sector is increasingly recognised as essential to achieving Australia's emissions targets. The assessment of embodied carbon is primarily undertaken through life cycle assessment, guided by ISO 14040:2006. However, this standard provides only high-level principles. In practice, Environmental Product Declarations (EPDs) are a key data source used to quantify embodied carbon in Australia (EPD Australasia, 2026). EPDs are third-party verified documents that provide environmental impact data for specific building products and are valuable in supporting informed material selection and detailed design decisions. The benefits and limitations of EPDs are discussed in the literature (Craft *et al.*, 2024). On the one hand, EPDs enhance transparency by providing standardised and independently verified environmental information. On the other hand, they can rely on inconsistent data sources and methodologies, vary in system boundaries, and lack full comparability across products. These limitations can make it challenging for practitioners to confidently select and compare materials based on embodied carbon performance.

Material substitution presents another practical pathway for reducing embodied carbon in the Australian context, as evidenced in the national report presented by the (Australia Government, 2021), the modelling result indicated that substituting conventional materials with lower-carbon alternatives, such as supplementary cementitious materials in concrete or recycled steel, could contribute significantly to emissions reduction (Haigh *et al.*, 2025). Green Building Council Australia (2023) released a practical guide to reducing carbon

emissions in new buildings and major renovations. This indicates how projects can track, reduce, and report upfront carbon across different life cycle stages. This requires a shift towards integrated, life cycle-oriented design thinking, to be progressively open to material substitution and alternative environmentally conscious building designs (Green Building Council Australia, 2023; Bera *et al.*, 2024). Industry-led initiatives also play an important role in advancing embodied carbon reduction. For example, the Materials and Embodied Carbon Leaders' Alliance (MECLA, 2026) promotes collaboration across stakeholders in the building and construction supply chain to accelerate decarbonisation efforts. However, despite these developments, implementation remains constrained by design-stage decisions and industry capability (Amarasinghe *et al.*, 2024). For instance, structural engineers must balance traditional priorities (e.g. cost, safety, structural stability, and constructability) with sustainability considerations, including material choices and emissions reduction.

3.7 Waste procurement and linked site practices

Waste procurement represents an important policy translation mechanism because sustainability requirements can be embedded directly within supplier agreements, subcontractor contracts, and waste management obligations. Approaches such as take-back schemes, recycled-content procurement requirements, and waste diversion targets convert circular economy objectives into enforceable project delivery practices (Ajayi *et al.*, 2017; Hamida *et al.*, 2024). Their effectiveness, however, remains dependent on contractor capability, project resources, and supply-chain participation. In addition to the above initiatives, many Australian jurisdictions adopt future-oriented targets to support and monitor waste management performance. Amongst the performance metrics, waste diversion rate (WDR) is a key performance indicator (Shooshtarian *et al.*, 2019). WDR refers to the proportion of waste diverted from landfill through activities such as reuse, recycling, repair, treatment, or energy recovery. Although diversion targets vary across jurisdictions, they generally reflect an increasing policy emphasis on reducing landfill dependency. For example, diversion targets are set at 90% by 2030 in South Australia, 90% by 2025 in the ACT, and 80% by 2030 in both New South Wales and Victoria (WasteDoor, 2025). Despite the absence of consistent, construction-specific diversion targets in some jurisdictions (Shooshtarian *et al.*, 2019), WDR remains an important metric for guiding policy development and evaluating waste management performance (Ratnasabapathy *et al.*, 2020). At the project level, planning frameworks also encourage the adoption of diversion targets. According to sustainable design guidelines developed by municipalities across Victoria, planning permit applicants are encouraged to set minimum recycling targets of 70%, with best practice ranging between 80% and 90% by mass (BESS, 2026). These targets reinforce the integration of procurement strategies and onsite practices, supporting a more systematic and performance-driven approach to construction and demolition waste management.

4. Conceptual framework and discussion

The proposed Policy-to-Practice Translation Framework is informed by both socio-technical systems theory and institutional theory. Together, these perspectives provide an explanatory basis for understanding how sustainability objectives move from policy ambition to project-level implementation. From a socio-technical systems perspective, sustainability outcomes emerge from interactions between regulatory structures, organisational processes, technological capabilities, industry practices, and stakeholder behaviours rather than from individual policy instruments alone. Construction projects can therefore be viewed as socio-technical systems in which sustainability requirements must be translated through multiple interconnected actors, decisions, and operational processes before influencing project outcomes. This perspective helps explain why the existence of sustainability policies does not automatically result in sustainability performance and highlights the importance of



intermediary translation mechanisms. Institutional theory provides a complementary explanation by emphasising how organisational behaviour is shaped by regulatory pressures, normative expectations, and industry practices. Within the Australian construction sector, sustainability requirements increasingly influence project decision-making through planning regulations, procurement frameworks, reporting obligations, and sustainability assessment tools. These institutional pressures create incentives and constraints that encourage organisations to adopt sustainability practices. However, institutional theory also suggests that implementation outcomes vary according to how organisations interpret, respond to, and operationalise these pressures. Together, these perspectives support the central proposition of the framework. Sustainability outcomes are not determined solely by policy ambition or regulatory requirements, but by the processes through which institutional pressures are translated into socio-technical decisions throughout the construction lifecycle. The framework was designed to capture both the characteristics of sustainability policy instruments and the pathways through which they influence construction decision-making. [Table 3](#) summarises the analytical domains and coding categories used in the study. The discussion and framework presented in this section are derived from comparative synthesis of policy documents, academic literature, and industry reports. Accordingly, the framework should be interpreted as a conceptual model that explains potential pathways through which sustainability requirements may be translated into construction decision-making, rather than as an empirically validated representation of project-level practice.

This coding structure enabled the transformation of heterogeneous qualitative evidence into a comparable analytical format. Rather than treating sources as isolated contributions, the approach facilitated the identification of recurring patterns in how sustainability requirements are translated into project-level decisions. The coded dataset is shown in [Table 4](#) and was subsequently used to support cross-case comparison between federal, New South Wales, and Victorian policy contexts, and to identify dominant translation pathways across lifecycle stages. In particular, the analysis revealed the central role of procurement as the primary interface through which policy is converted into enforceable decision rules, as well as the disproportionate influence of early-stage planning and design decisions on lifecycle carbon outcomes. The coding framework and its relationship to the broader analytical process are illustrated in [Figure 2](#), which conceptualises the integration of evidence sources, coding domains, and synthesis outputs. This structured approach provides the empirical and analytical foundation for the Policy-to-Practice Translation Framework developed in the following sections.

Existing sustainability governance frameworks typically focus on policy instruments, regulatory structures, and institutional drivers of change, while construction management frameworks often examine stakeholder behaviour, procurement practices, project delivery processes, or implementation barriers. Circular economy frameworks similarly focus on

Table 3. Coding framework domains

Domains	Justification
Policy type	Capturing the form of governance instrument (e.g. regulation, procurement policy, rating system, or strategic framework)
Translation mechanism	Identifying how policy objectives are operationalised (e.g. reporting requirements, contractual obligations, technical tools, or implementation guidelines)
Lifecycle stage	Indicating the point in the construction process at which the mechanism exerts influence (planning, design, procurement, or construction)
Decision impact	Describing the specific aspect of project decision-making affected (e.g. material selection, carbon measurement, waste management, or supplier engagement)
Constraint	Capturing the primary limitations affecting implementation (e.g. cost, capability, fragmentation, or supply chain constraints)

Table 4. Coding dataset

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Environment

Source	Policy type	Mechanism	Lifecycle stage	Decision impact	Constraint
Climate Change Act 2022 (Australia Government, Department of Climate Change, 2026, Climate Change Authority, 2025)	Regulation (Federal)	Targets/ strategic direction	Planning (macro)	Sets emissions expectations	Non-specific to construction
National Construction Code (NCC) (Australian Building Codes Board, 2025)	Regulation	Compliance standards	Design	Energy/material specification	Focus on operational, not embodied
Commonwealth ESP Policy (Australia Government Department of Finance, 2025; Infrastructure Australia, 2024)	Procurement	Contractual and reporting	Procurement	Forces embodied carbon reporting	Cost + capability
National Sustainable Procurement Guideline (Australia Government Department of Infrastructure, 2025)	Procurement	Guidance/ benchmarking	Procurement	Influences tender criteria	Non-mandatory uptake
NSW SEPP (Sustainable Buildings) (NSW Government Planning, 2025; NSW Government Department of Planning, 2023; NSW Government Department of Planning Housing and Infrastructure, 2026; Planning, 2025)	Regulation (Planning)	Reporting/ disclosure	Planning	Forces LCA and emissions disclosure	No hard targets yet
NSW Embodied Emissions Technical Note (NSW Government Department of Planning Housing and Infrastructure, 2026)	Regulation support	Technical methodology	Planning/ Design	Standardises carbon calculation	Data complexity

(continued)

Table 4. Continued

Source	Policy type	Mechanism	Lifecycle stage	Decision impact	Constraint
Victoria Recycled First Policy (Australian Sustainable Built Environment Council, 2025 ; Victoria State Government Victorias Big Build, 2023, 2025, 2026)	Procurement	Targets and reporting	Procurement	Drives recycled material use	Supply availability
Circular Economy Framework (2024) (Australia Government. Department of Climate Change, 2024)	Strategy (Federal)	Policy alignment	Planning (macro)	Drives circularity agenda	Non-binding
BASIX (Planning, 2025)	Regulation (State)	Compliance tool	Design	Requires embodied carbon calculation	Limited scope
NABERS (NABERS, 2024)	Rating system	Benchmarking	Operation/ Design	Performance tracking	Limited embodied carbon scope
Green Star (Green Building Council Australia, 2026)	Rating system	Incentives/ credits	Design	Encourages low-carbon materials	Voluntary uptake
Infrastructure Australia report (Infrastructure Australia, 2024)	Industry	Data and projections	Planning	Quantifies emissions baseline	No enforcement
GBCA Carbon Reduction Guide (Green Building Council Australia, 2023)	Industry	Guidance/ tools	Design	Supports material decisions	Voluntary
MECLA (MECLA, 2026)	Industry collaboration	Knowledge sharing	Design/ Procurement	Accelerates decarbonisation	Coordination limits
Amarasinghe et al. (2024)	Academic	Analytical insight	Design	Highlights embodied carbon importance	Implementation complexity
Shooshtarian et al. (2025)	Academic	Policy evaluation	Procurement	Identifies recycled material gaps	Weak incentives
Gurusinghe et al. (2025)	Academic	Framework (ReSOLVE)	Design	Circular strategy guidance	Industry fragmentation
Zhang et al. (2026)	Academic	Conceptual alignment	Planning	Links carbon + circular economy	Integration difficulty
Li et al. (2025)	Academic	Indicator framework	Design	Improves circularity measurement	Lack of standardisation
Hasselsteen et al. (2026)	Academic	LCA modelling	Design	Indicates early-stage carbon lock-in	Data intensity

(continued)

Table 4. Continued

Source	Policy type	Mechanism	Lifecycle stage	Decision impact	Constraint
Ahmed <i>et al.</i> (2024)	Academic	Procurement analysis	Procurement	Indicates procurement influence	Adoption variability
Ajayi <i>et al.</i> (2017)	Academic	Waste minimisation model	Procurement	Improves material efficiency	Contractual complexity
Park and Tucker (2017)	Academic	Barrier analysis	Construction	Identifies reuse barriers	Client resistance
Senarathne <i>et al.</i> (2025)	Academic	Material passports	Design	Enables circular tracking	Data infrastructure

Smart and Sustainable Built Environment

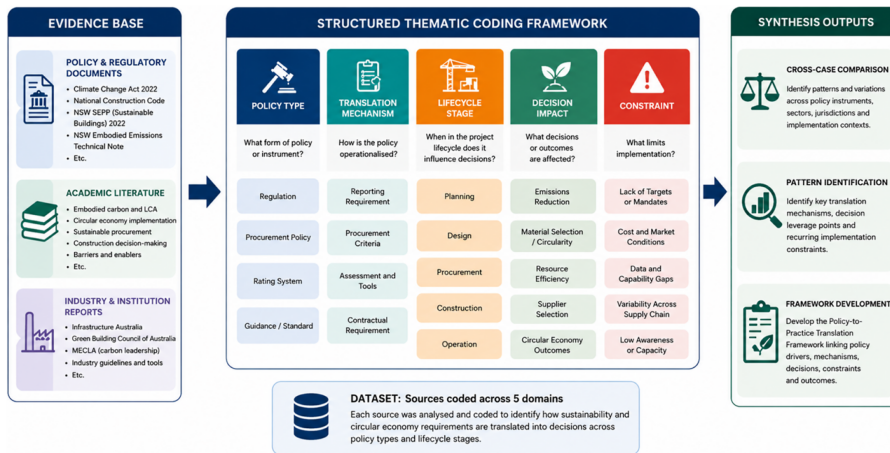


Figure 2. Policy-to-practice coding framework: dataset structure and analytical process

material flows, resource recovery strategies, and design interventions. Although these approaches provide valuable insights, they generally examine individual components of sustainability implementation rather than the relationships between them. The Policy-to-Practice Translation Framework advances existing models by explicitly introducing translation mechanisms as the analytical link between policy ambition and project-level outcomes. Rather than assuming that sustainability policies are directly implemented, the framework conceptualises implementation as a multi-stage translation process occurring across planning, design, procurement, and construction activities. By integrating policy drivers, translation mechanisms, lifecycle decision points, implementation constraints, and sustainability outcomes within a single explanatory structure, the framework provides a more comprehensive account of how sustainability requirements become operationalised in practice.

4.1 From policy presence to policy translation

Australia's construction sector is no longer characterised by a lack of sustainability policy. Instead, it operates within an increasingly complex policy environment comprising regulations, planning instruments, procurement frameworks, and sustainability rating

systems. Despite this expansion, implementation outcomes remain uneven across projects and jurisdictions. This suggests that policy effectiveness depends not only on the existence of policy instruments but also on the processes through which they are translated into project-level decisions. The synthesis suggests that sustainability requirements may rarely influence construction outcomes directly. Rather, they operate through intermediary mechanisms such as reporting obligations, procurement criteria, technical assessment tools, contractual requirements, and implementation guidance. These mechanisms convert high-level policy objectives into actionable decision parameters that can be applied by project stakeholders throughout the construction lifecycle. This observation shifts the analytical focus from policy development towards policy translation. Understanding how sustainability requirements are interpreted and operationalised provides a more meaningful explanation of implementation outcomes than examining policy instruments alone. Figure 3 illustrates this conceptual transition from policy presence to policy translation and provides the foundation for the framework developed in the following section.

4.2 A policy-to-practice translation framework

This study proposes a policy-to-practice translation framework for sustainable construction decision-making as shown in Figure 4. The framework conceptualises sustainability implementation as a multi-layered process involving five interdependent domains:

- (1) Policy and institutional drivers
- (2) Translation mechanisms
- (3) Lifecycle decision points
- (4) Industry response and constraints
- (5) Outcomes and feedback loops.

At the policy layer, national emissions targets, regulatory codes, planning instruments, procurement policies, and rating systems establish the direction, expectations, and legitimacy of sustainability action. However, these instruments do not directly influence construction practice. Their effects are mediated through translation mechanisms, which include compliance requirements (e.g. mandatory reporting), procurement criteria (e.g. tender evaluation metrics), technical tools (e.g. life cycle assessment and EPDs), and implementation

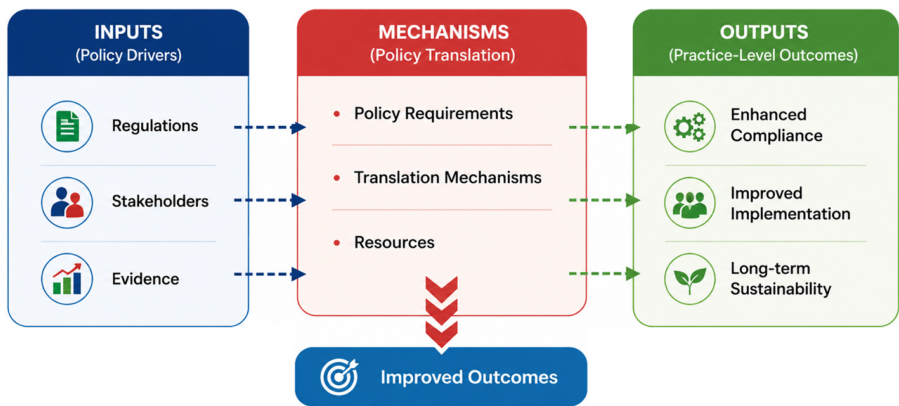


Figure 3. Policy presence to policy translation

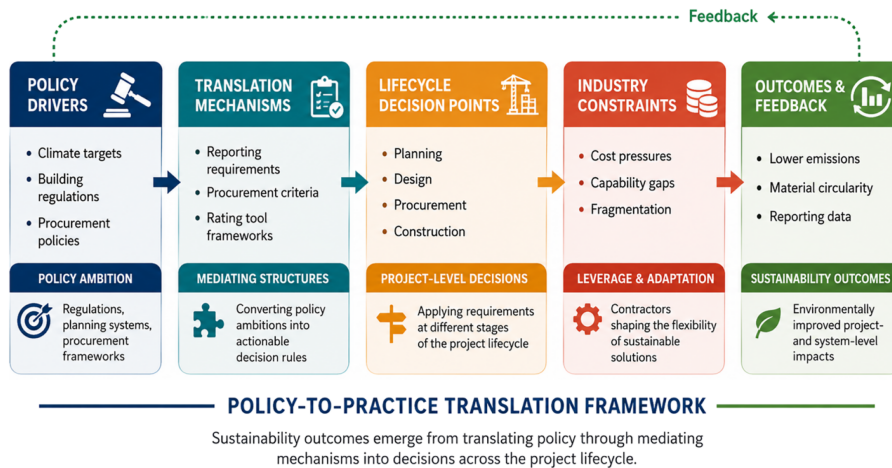


Figure 4. Policy-to-Practice translation framework for sustainable construction decision making

guidelines. These mechanisms convert abstract sustainability objectives into decision-relevant information and constraints, shaping how stakeholders engage with sustainability during project delivery. The translated requirements are then enacted across project lifecycle decision points, including planning, design, procurement, and construction. At each stage, different stakeholders interpret and apply sustainability requirements within the limits of their roles, knowledge, and incentives. Critically, implementation is conditioned by the industry response layer, which reflects structural characteristics of the construction sector, including fragmentation, capability variability, cost pressures, and supply chain limitations. These factors mediate how effectively translated policy requirements are realised in practice. Finally, the framework recognises outcomes and feedback loops, whereby project-level performance data, reporting practices, and industry learning inform future policy development, standardisation, and capability building. This dynamic perspective positions sustainability implementation as an evolving socio-technical system rather than a linear policy process.

The primary theoretical contribution of this study is the reconceptualisation of sustainability implementation as a policy translation process rather than a policy adoption or compliance process. Existing sustainability governance studies have predominantly focused on policy instruments, institutional arrangements, and regulatory drivers, while construction decision-making research has generally examined stakeholder behaviour, procurement practices, or implementation barriers as separate areas of inquiry. Consequently, the mechanisms linking policy ambition to project-level action have remained underexplored. The Policy-to-Practice Translation Framework addresses this gap by introducing translation mechanisms as an explicit analytical layer between policy objectives and construction outcomes. Rather than assuming that sustainability requirements are directly implemented, the framework explains how they are interpreted, negotiated, embedded within lifecycle decisions, and ultimately operationalised through planning, design, procurement, and construction activities. This provides a more comprehensive explanation of why similar policy objectives can generate different outcomes across projects, organisations, and jurisdictions. By integrating policy drivers, translation mechanisms, lifecycle decision points, implementation constraints, and sustainability outcomes within a single socio-technical structure, the framework extends existing sustainability governance and construction management literature. Moreover, this provides a foundation for future empirical investigation of policy implementation processes.

4.3 Lifecycle decision-making and carbon lock-in

The framework suggests that decision timing plays an important role in shaping sustainability outcomes. Decisions made during planning and design stages exert a disproportionate influence on embodied carbon and material circularity because they establish fundamental project parameters, including structural systems, material specifications, building form, and demolition versus reuse strategies. Once these decisions are embedded within project documentation, opportunities for substantial environmental improvement become progressively constrained. The growing emphasis on embodied carbon reporting within planning systems, particularly in New South Wales, reflects recognition that sustainability performance must be considered before construction commences. However, effective implementation requires continuity across subsequent lifecycle stages. Sustainability objectives established during planning and design must be reinforced through procurement processes and construction practices to avoid dilution during project delivery. Consequently, sustainability performance should be viewed as the cumulative outcome of interconnected lifecycle decisions rather than the product of any single intervention. Figure 5 illustrates the relationship between lifecycle decision timing and environmental influence, highlighting the significance of early-stage carbon lock-in.

4.4 Fragmentation as a structural constraint

The framework further explains that uneven implementation of sustainability requirements is not merely a function of weak policy, but a structural characteristic of the construction industry. The sector operates as a fragmented, project-based system, in which decision-making authority is distributed across multiple actors with differing objectives, expertise, and risk exposures. From an institutional perspective, this fragmentation results in misaligned incentives and interpretive variability, where sustainability requirements are understood and prioritised differently by clients, designers, contractors, and suppliers. From a socio-technical perspective, sustainability implementation requires coordination across interdependent

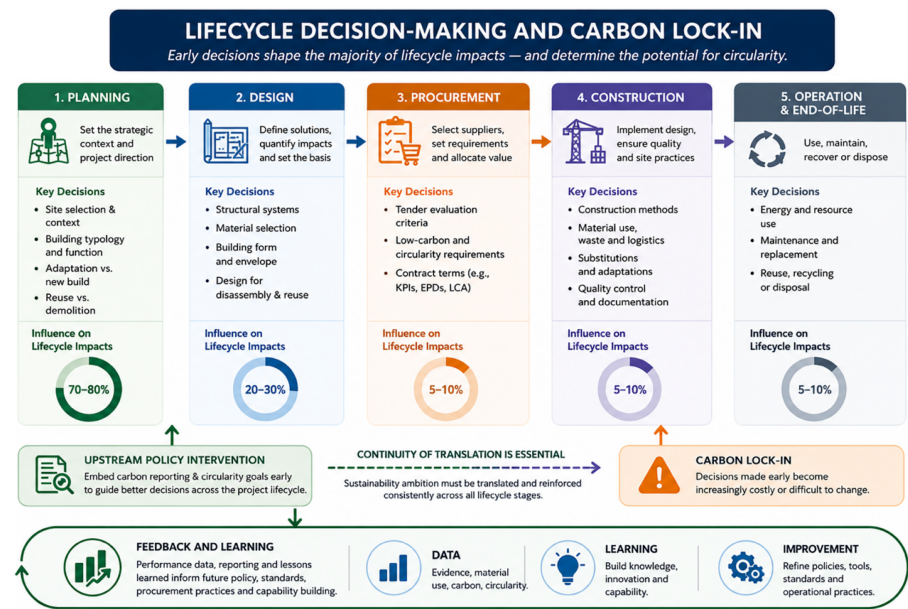


Figure 5. Lifecycle decision making and carbon lock in

technical systems (materials, tools, data) and social systems (organisations, contracts, practices). The absence of alignment across these systems leads to inconsistent application of sustainability measures, even in the presence of strong policy signals. This explains why policies such as embodied carbon reporting or recycled content requirements may be effectively implemented in some projects while remaining superficial in others. The issue is not solely regulatory strength, but the capacity of the socio-technical system to absorb and operationalise policy requirements. The structural fragmentation of the construction industry is conceptualised in [Figure 6](#).

4.5 Comparative effectiveness of policy translation mechanisms

The analysis suggests that not all sustainability policy mechanisms exert equal influence on construction decision-making. While reporting frameworks, planning regulations, procurement requirements, and sustainability assessment tools all contribute to implementation, they operate through different pathways and possess varying levels of influence over project outcomes. Reporting mechanisms represent the most widely adopted policy approach across Australian jurisdictions. Their primary function is to improve transparency, establish performance baselines, and support capability development. Although reporting requirements play an important role in generating data and increasing awareness of embodied carbon and circular economy performance, their influence is largely indirect because they do not necessarily require changes to project delivery practices. Planning-system interventions provide a stronger implementation pathway by embedding sustainability requirements within project approvals and development processes. The NSW Sustainable Buildings SEPP illustrates how embodied carbon considerations can be introduced during early project stages where opportunities for environmental improvement are greatest ([NSW Government Planning, 2025](#)). However, planning mechanisms generally focus on project approval rather than ongoing delivery and therefore rely on subsequent implementation processes to achieve intended outcomes.

Procurement-based approaches appear to offer the most direct policy-to-practice translation pathway. By incorporating sustainability requirements into tender evaluation, contractual obligations, supplier selection criteria, and performance reporting, procurement mechanisms directly influence material choices, construction methods, and supply-chain behaviour. Unlike reporting systems, procurement requirements can create enforceable

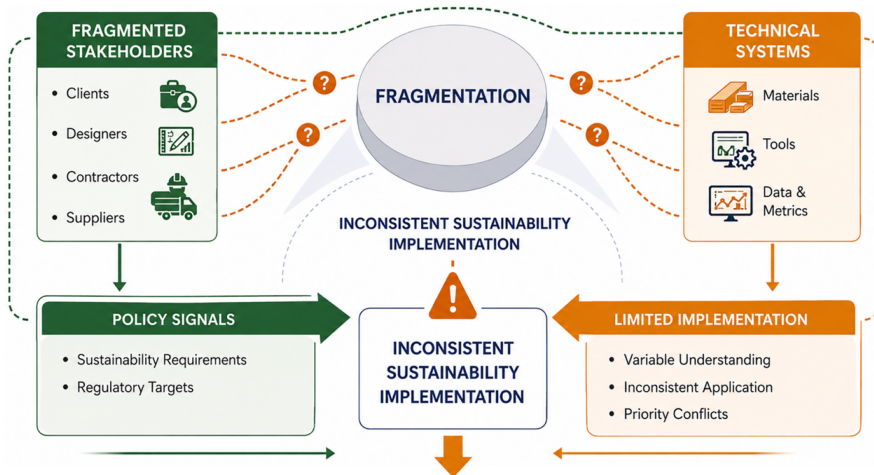


Figure 6. Fragmentation in construction as a structural constraint

obligations that extend throughout project delivery. Voluntary sustainability assessment frameworks, such as Green Star and IS Rating, occupy an intermediate position (Green Building Council Australia, 2026; Infrastructure Sustainability Council, 2026). These tools provide structured methodologies for measuring performance and encouraging best practice, but their effectiveness depends largely on client commitment and market incentives rather than regulatory enforcement. The comparative analysis indicates a progression in implementation effectiveness from awareness-oriented mechanisms towards outcome-oriented mechanisms. Reporting frameworks are effective for establishing measurement capability, planning regulations influence early-stage decision-making, and procurement mechanisms provide the strongest direct leverage over project implementation. This comparison supports the broader conclusion that future policy development is likely to become increasingly focused on performance-based approaches that combine measurement, accountability, and enforceable implementation requirements. While sustainability policies are often discussed collectively, their influence on construction decision-making varies considerably depending on the mechanisms through which they are implemented. Table 5 compares the major policy translation mechanisms identified in this study and evaluates their relative strengths, limitations, and implementation effectiveness across the construction lifecycle.

4.6 Procurement as the critical translation interface

The analysis suggests that procurement may represent one of the most influential interfaces between sustainability policy and construction practice. Unlike planning and design, which establish intentions and objectives, procurement determines what is contractually specified, measured, and enforced throughout project delivery. The increasing use of procurement-based sustainability policies, including the Commonwealth Environmentally Sustainable Procurement Policy and Victoria’s Recycled First Policy, demonstrates a shift towards market-based implementation mechanisms. By embedding sustainability requirements within tender evaluations, contractual obligations, supplier selection processes, and performance reporting systems, procurement converts policy objectives into enforceable project requirements (Australia Government Department of Infrastructure, 2025). This finding suggests that procurement represents a key leverage point for sustainability implementation. Policies that are effectively integrated into procurement processes are more likely to influence material selection, supplier behaviour, and construction practices than policies relying solely on voluntary uptake or reporting mechanisms. Figure 7 illustrates the role of procurement as the principal interface through which sustainability objectives are translated into operational decisions.

4.7 Evolution from reporting to performance regulation

The reviewed evidence suggests that Australia’s sustainability policy landscape is transitioning from a reporting-based model towards a performance-based regulatory

Table 5. Comparative characteristics of sustainability policy mechanisms in construction

Mechanism	Primary function	Lifecycle influence	Enforcement level	Implementation effectiveness
Reporting and disclosure	Measurement and transparency	Medium	Low	Low-moderate
Planning regulations	Early-stage intervention	High	Moderate	Moderate-high
Procurement requirements	Contractual implementation	High	High	High
Rating tools	Market signalling and benchmarking	Medium	Low-moderate	Moderate
Performance thresholds	Outcome based regulation	High	High	Potentially high

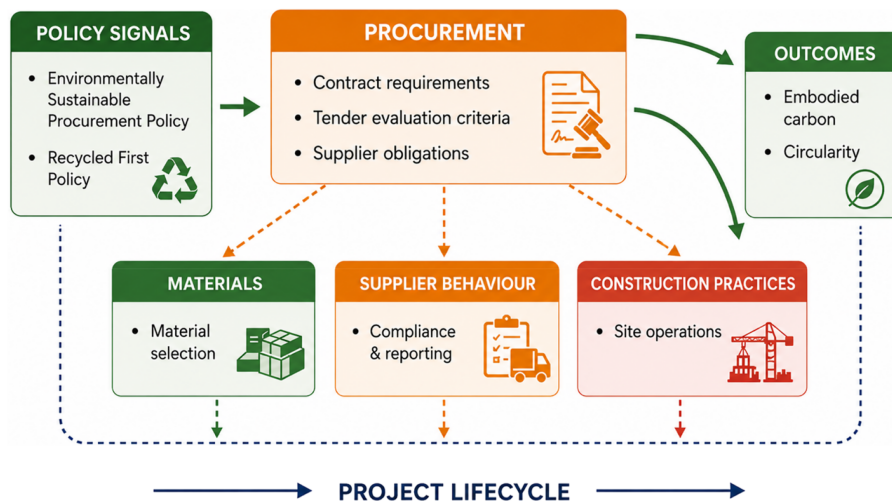


Figure 7. Procurement as they key interface for sustainability

approach. Current initiatives largely emphasise disclosure, measurement, and transparency, particularly in relation to embodied carbon and circular economy performance. While these mechanisms establish important baselines and improve industry capability, they do not necessarily guarantee environmental improvement. The trajectory emerging across federal and state initiatives suggests a gradual movement towards performance benchmarks, thresholds, and comparative accountability. Such a transition would align sustainability regulation more closely with measurable outcomes rather than reporting compliance alone. However, achieving this shift will require greater consistency in assessment methodologies, improved data availability, and enhanced industry capability. The proposed framework highlights several priorities for future policy development. Greater alignment between jurisdictions, standardisation of reporting requirements, and integration of sustainability criteria within lifecycle decision points will be critical for improving implementation effectiveness. For industry stakeholders, increasing capability in life-cycle assessment, carbon accounting, circular procurement, and material traceability will become increasingly important as sustainability requirements continue to mature. [Figure 8](#) conceptualises this evolution from reporting-focused governance towards performance-based regulation and illustrates the future direction of sustainability policy within the Australian construction sector.

5. Conclusion

This study examined how sustainability and circular economy requirements are translated into project-level decision-making within the Australian construction industry. While previous research has primarily focused on sustainability barriers, drivers, and policy objectives, the findings demonstrate that the effectiveness of sustainability policy depends not only on the design of policy instruments but also on the mechanisms through which they are operationalised within construction projects. Sustainability outcomes are therefore shaped by a sequence of interconnected decisions occurring across planning, design, procurement, and construction stages rather than by policy intervention alone.

The principal contribution of this research is the development of a Policy-to-Practice Translation Framework that conceptualises sustainability implementation as a multi-layered socio-technical process linking policy drivers, translation mechanisms, lifecycle decision points, industry constraints, and implementation outcomes. The framework proposes a

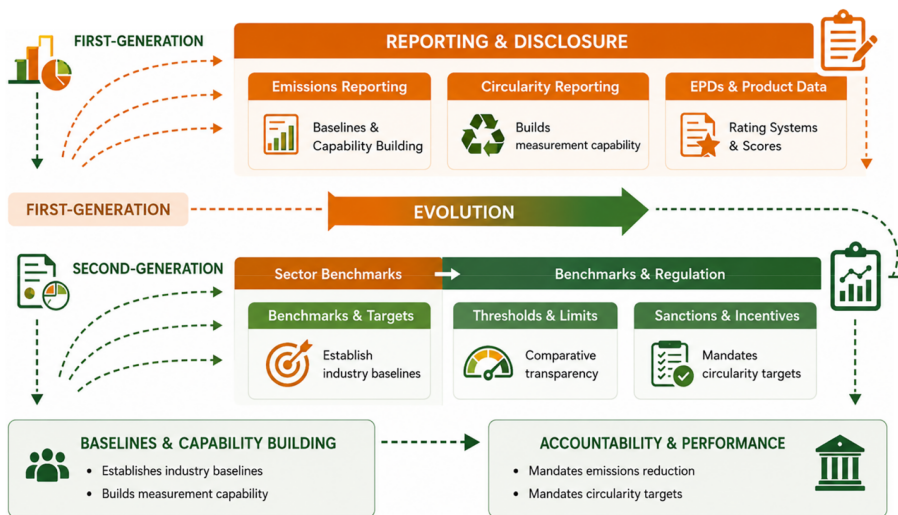


Figure 8. Evolution from reporting to performance regulation

structured explanation of how sustainability objectives are converted into actionable project requirements through reporting obligations, procurement criteria, technical assessment tools, contractual mechanisms, and implementation guidance. In doing so, it shifts the analytical focus from policy existence toward policy translation and implementation effectiveness.

The findings have several important implications for policymakers. First, achieving consistency in sustainability outcomes will require greater harmonisation of reporting methodologies, embodied carbon assessment approaches, recycled-content requirements, and evidence standards across Australian jurisdictions. The current patchwork of federal and state requirements creates compliance complexity and risks uneven capability development across the industry. Second, policy instruments should increasingly be aligned with lifecycle decision points where sustainability outcomes can be most effectively influenced, particularly during planning, design, and procurement stages. Third, governments should move beyond disclosure-focused approaches by progressively introducing sector-specific benchmarks, embodied carbon targets, recycled-content thresholds, and performance-based procurement requirements supported by standardised measurement frameworks. For industry stakeholders, the framework highlights the growing importance of organisational capability in areas such as life-cycle assessment, embodied carbon measurement, circular procurement, material traceability, and sustainability reporting. As regulatory expectations evolve, sustainability performance is likely to become a core determinant of project competitiveness and supply-chain participation rather than a voluntary differentiator. Early integration of sustainability considerations into design development, procurement strategies, and contractor engagement processes will therefore be essential for maintaining compliance and achieving project-level sustainability objectives.

The analysis also suggests that accelerating the transition from reporting-based governance to performance-based regulation will require coordinated action across government, industry, and professional bodies. Priority actions include the development of nationally consistent embodied carbon databases, wider adoption of environmental product declarations, standardised life-cycle assessment methodologies, digital material tracking systems, and procurement frameworks that reward verified environmental performance. Collectively, these measures would improve data quality, reduce implementation uncertainty, and provide the evidence base necessary to support enforceable performance thresholds. From a theoretical

perspective, the study contributes to sustainability governance and construction management literature by shifting attention from policy formulation towards policy translation. The findings suggest that sustainability outcomes cannot be fully explained by policy ambition, regulatory stringency, or organisational intent alone. Instead, implementation depends on the mechanisms through which sustainability requirements are embedded within lifecycle decision-making processes. This perspective provides a new explanatory lens for understanding variations in sustainability performance across projects and jurisdictions and establishes a foundation for future research examining policy implementation within the built environment.

The findings of this study contain several methodological limitations. First, the research is based on a comparative synthesis of policy documents, academic literature, and industry reports rather than direct empirical investigation of construction projects. While this approach is appropriate for conceptual framework development, it limits the ability to verify how sustainability requirements are interpreted and implemented by project stakeholders in practice. Second, the analysis focuses primarily on the Australian context, with particular attention to New South Wales and Victoria due to their relatively mature sustainability policy frameworks. Although the findings may provide insights relevant to other jurisdictions, the transferability of the framework requires further examination in different regulatory and institutional environments. Third, the study adopts a structured but non-systematic review approach, meaning that source selection was guided by conceptual relevance rather than exhaustive coverage of all available literature and policy documents. These limitations create several opportunities for future research. The most immediate priority is empirical validation of the Policy-to-Practice Translation Framework through case studies, stakeholder interviews, surveys, and project-level investigations. Future studies could examine how sustainability requirements are interpreted by clients, designers, contractors, procurement specialists, and regulators across different project types. Comparative studies across Australian jurisdictions and international contexts would also help determine the extent to which policy translation mechanisms vary under different governance arrangements. In addition, longitudinal research could explore how emerging performance-based regulations influence decision-making over time and whether they generate measurable improvements in embodied carbon reduction, circular material use, and broader sustainability outcomes. Such research would enable refinement of the framework and strengthen understanding of the relationship between policy ambition, implementation processes, and project performance.

Acknowledgments

This study is based exclusively on the analysis of publicly available documents and published literature. No human participants were involved in the research. Consequently, ethics approval and informed consent were not required.

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Corresponding author

Robert Haigh can be contacted at: robert.haigh@vu.edu.au